
**ATIS-1000042**

# SUPPORT FOR LAWFULLY AUTHORIZED ELECTRONIC SURVEILLANCE (LAES) OF ADVANCED VOICE OVER PACKET (VOP) CONFERENCING

**TECHNICAL REPORT**

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ATIS-1000042, *Support for Lawfully Authorized Electronic Surveillance (LAES) of Advanced Voice over Packet (VoP) Conferencing*

Is an ATIS Standard developed by the **Lawfully Authorized Electronic Surveillance (LAES) Subcommittee** under the **ATIS Packet Technologies and Systems Committee (PTSC)**.


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**ATIS-1000042**

ATIS Technical Report on

# Support for Lawfully Authorized Electronic Surveillance (LAES) of Advanced Voice over Packet (VoP) Conferencing

**Alliance for Telecommunications Industry Solutions**

Approved March 2012

**Abstract**

This Technical Report (TR) provides the results of the initial study of Lawfully Authorized Electronic Surveillance (LAES) of advanced Voice over Packet (VoP) conferencing services.

## Foreword

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

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

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

At the time of initiation or issuance of the letter ballot for this document, PTSC, which was responsible for its development, had the following leadership:

M. Dolly, PTSC Chair [AT&T]
V. Shaikh, PTSC Vice-Chair [Telcordia]
G. Myers, PTSC-LAES Chair [Counter Link]
N. Rao, PTSC-LAES Vice-Chair [Nokia Siemens Networks]
T. Jacobson, Technical Editor [Alcatel-Lucent]

The PTSC Lawfully Authorized Electronic Surveillance (LAES) Subcommittee, which was responsible for the development of this document, had the following participating organizations:

Alcatel-Lucent
AT&T
Century Link
Cisco Systems
Counter Link
Ericsson
ETI Connect
FBI
IP Fabrics
Nokia Siemens Networks
Nortel Networks
Pen Link
PSEP Canada
RCMP
Research In Motion
Rogers
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SS8
Verint
Verizon

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ATIS Technical Report on

# Support for LAES of Advanced VoP Conferencing

## 1 Scope, Purpose, & Application

This Technical Report (TR) completes and provides the results of the study of Lawfully Authorized Electronic Surveillance (LAES) for Advanced Voice over Packet (VoP) Conferencing Services. Advanced conferencing makes available sophisticated services for communications among multiple parties beyond those available in three-way calls (e.g., access control and media policies can be applied, information about the Conference can be provided to the involved parties).

This TR describes the Advanced VoP Conferencing Services from an LAES perspective and defines the capabilities that can be used for lawful interception of such services. Any requirements or standards language (i.e., "shall", "should", etc.) are used strictly in the context of ensuring that this TR is inherently sound and provides appropriate guidance to voluntary implementers. This TR is not intended to imply that the topic of LAES for Advanced VoP Conferencing Services falls under the Communications Assistance for Law Enforcement Act (CALEA).

### *1.1 Scope*

This TR addresses LAES capabilities for intercepting and reporting, pursuant to a lawful authorization, the communications of a network-based (i.e., not customer premises equipment based) Session Initiation Protocol (SIP) voice Conference as described in IETF RFC4353 [Ref 4], created by an Intercept Subject. With respect to conferencing content, this TR addresses the interception of VoP content at a network-based audio conference mixer. Other types of SIP conferences -- such as a multi-media (e.g., video, data) conference -- are outside the scope of this TR.

### *1.2 Purpose*

This TR is provided as a specification for addressing lawful intercept of Advanced VoP Conferencing.

### *1.3 Application*

The LAES capabilities defined in this TR are intended to be used for intercepting and reporting the communications of a conference created by an Intercept Subject.[1] Once a Conference is created by an Intercept Subject, the Conference is intercepted whether or not the Intercept Subject joins the Conference.

[1] The capabilities defined in this TR can also be used, if lawfully authorized, to intercept the communications of a conference not created by an Intercept Subject (i.e., to intercept the communications of a conference identified by a proper identity in the lawful authorization).

# 2 Normative References

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

[Ref 1] IETF RFC4579, *Session Initiation Protocol (SIP) Call Control – Conferencing for User Agents, August*, 2006.[2]

[Ref 2] IETF RFC3261, *SIP: Session Initiation Protocol*, June 2002.[2]

[Ref 3] IETF RFC4825, *The Extensible Markup Language (XML) Configuration Access Protocol (XCAP)*, May 2007.[2]

[Ref 4] IETF RFC4353, *A Framework for Conferencing with the Session Initiation Protocol (SIP)*, February 2006.[2]

[Ref 5] ATIS-1000678.b.2010, *Supplement B to ATIS-1000678.2006, Lawfully Authorized Electronic Surveillance (LAES) for Voice over Packet Technologies in Wireline Telecommunications Networks*, August 2010.[3]

[Ref 6] ANSI/J-STD-025-B, *Lawfully Authorized Electronic Surveillance*, July 2006.[3]

# 3 Definitions, Acronyms, & Abbreviations

For a list of common communications terms and definitions, please visit the *ATIS Telecom Glossary*, which is located at < http://www.atis.org/glossary >.

## *3.1 Definitions*

**3.1.1 Conference:** An instance of a multi-party VoP conversation.

**3.1.2 Conference Focus:** A SIP user agent [Ref 1] in the network that maintains a SIP [Ref 2] signaling relationship with each Conference Party during the conference. A Conference Focus is identified and addressed by a Conference ID.

**3.1.3 Conference ID:** An identifier that uniquely identifies a specific Conference. For SIP, this is a Conference Uniform Resource Identifier (URI).

**3.1.4 Conference Manager:** A network-based function that interacts with the requestor of a Conference to set up, reserve, modify and maintain a Conference. The Conference Manager may perform such tasks as allocating a Conference ID to identify the Conference, publishing the Conference ID, and maintaining data such as Conference requestor information, Conference starting, and Conference stopping time. The Conference Manager functionality includes the Conference Policy and Conference Policy Server functionality defined in [Ref 4].

**3.1.5 Conference Mixer:** A network-based function that provides the media connection to the parties in the Conference and provides for the mixing of media.

**3.1.6 Conference Party:** A party invited to, joined to, or dropped from a Conference.

**3.1.7 Conference Requestor:** A subscriber who interacts with a Conference Manager to set up, reserve, and update a Conference.

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

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

**3.1.8 Intercept Subject:** A subscriber whose communications, communications identifying information, or both, have been authorized by a court to be intercepted and delivered to a Law Enforcement Agency. The identification of the Intercept Subject is limited to identifiers used to access the particular equipment, facility, or communication service (e.g., network address, terminal identity, subscription identity, SIP-URI).

## *3.2 Acronyms & Abbreviations*

| | |
|---|---|
| APDU | Application Protocol Data Unit |
| CALEA | Communications Assistance for Law Enforcement Act |
| CC | Call Content |
| CC-APDU | Call Content-Application Protocol Data Unit |
| CF | Collection Function |
| CII | Call-Identifying Information |
| DF | Delivery Function |
| IAP | Intercept Access Point |
| IETF | Internet Engineering Task Force |
| IP | Internet Protocol |
| LAES | Lawfully Authorized Electronic Surveillance |
| LEA | Law Enforcement Agency |
| LI | Lawful Intercept |
| MOC | Mandatory/Optional/Conditional |
| RTP | Real-Time Transport Protocol |
| SIP | Session Initiation Protocol |
| TR | Technical Report |
| TSP | Telecommunications Service Provider |
| URI | Uniform Resource Identifier |
| VoP | Voice over Packet |
| XCAP | XML Configuration Access Protocol |
| XML | Extensible Markup Language |

# 4 Modeling of Advanced VoP Conferencing from an LAES Perspective

Figure 1 shows the model for Advanced VoP Conferencing from an LAES perspective. Note that this model is functional and the functions may be combined or distributed in actual network entities. This model assumes a tightly coupled Conference as defined in [Ref 4].

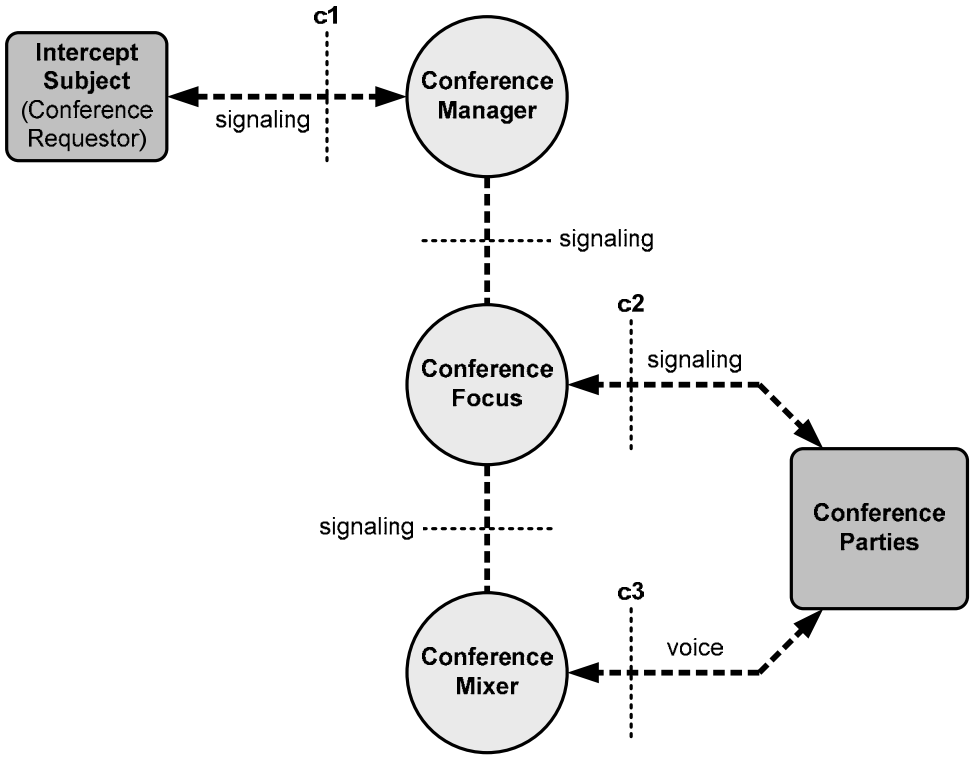



**Figure 1: Advanced VoP Conferencing Model from an LAES Perspective**

## *4.1 Conference Manager*

The Conference Requestor[4] interacts with a Conference Manager over the 'c1' interface to set up, reserve, and update a Conference. The signaling may be SIP [Ref 2], XCAP [Ref 3], or other type of signaling. At the request of the Conference Requestor, the Conference may be established immediately or at some future time. The Conference Requestor may also update the Conference information after the Conference has been reserved. The Conference Requestor provides Conference information such as: parties to be invited or referred to the Conference (including the Intercept Subject), start time of Conference, and duration of Conference. Either the Conference Requestor or Conference Manager may assign a Conference Identifier for the Conference.

The Conference Manager functionality includes the Conference Policy and Conference Policy Server functionality defined in [Ref 4].

## *4.2 Conference Focus*

The Conference Focus manages the parties to the Conference over the 'c2' interface using SIP Methods according to the rules of the Conference. The Conference Focus may invite parties to the Conference or may receive requests from the parties who want to join the Conference. The Conference Focus may drop parties from the Conference or may receive requests from parties who want to be dropped from the Conference. The Conference Focus may place a party on hold or may receive a request from a party who wants to be placed on hold. The Conference Focus may retrieve a party from hold or may receive a request from a party who wants to be retrieved from hold.

[4] The Conference Requestor may be the Intercept Subject or someone acting on behalf of the Intercept Subject.

### 4.3 Conference Mixer

The Conference Mixer provides the media connection to the parties in the Conference over the 'c3' interface and provides for the combining of media streams.

# 5 LAES Functional Model

Figure 2 shows the LAES Functional Model. Note that the model is functional and the functions and Intercept Access Points (IAPs) may be combined or distributed in actual network entities.

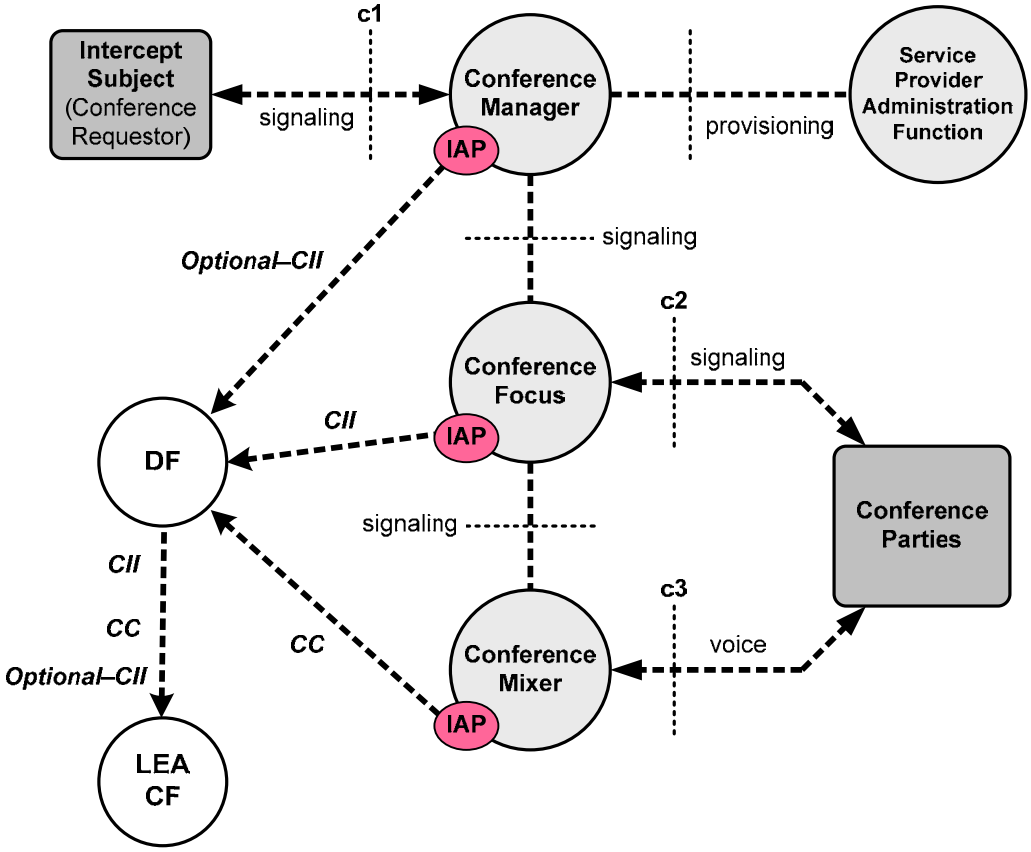



**Figure 2: LAES Functional Model for Advanced VoP Conferencing**

### 5.1 Conference Manager

The Conference Manager IAP is optional (see Annex A for reporting of Optional-CII).

### 5.2 Conference Focus

The Conference Focus IAP reports the following CII when known:

- Reports the start and end of the Conference.
- Reports parties invited or referred to the Conference.
- Reports the parties added to and dropped from the Conference.
- Reports the Conference parties placed on hold or retrieved from hold.
- Reports the parties on an active Conference when lawful interception starts after the Conference has

started.

- Reports party invitation failure.

## *5.3 Conference Mixer*

The Conference Mixer IAP delivers the following Call Content (CC) when lawfully authorized:

- The mixed media streams of the parties joined to the Conference.

See Clause 7, LAES Call Content Surveillance Messages.

## *5.4 Service Provider Administration Function*

The Service Provider Administration Function provisions the lawful interception in the Conference Manager.

# 6 LAES CII Reporting Capabilities

LAES CII reporting occurs when a conferencing event is detected at a Conference Focus IAP. This clause describes the messages that report the conferencing events.

Each CII report message is described as consisting of a set of parameters. Each parameter is either:

- *Mandatory (M)* — Required for the message;
- *Optional (O)* — Provided at the discretion of the implementation; or
- *Conditional (C)* — Required in situations where a condition (defined in the description column of the table) is met.

The information to be conveyed by each parameter is identified. Note that both optional and conditional parameters are considered to be OPTIONAL syntactically in the abstract syntax descriptions. The inclusion requirements in this clause take precedence over the abstract syntax definitions.

The following timing requirements shall apply to the delivery of CII:

- Each surveillance message shall be sent by the Delivery Function to the Collection Function within eight (8) seconds of receipt by the IAP of the information pertaining to the CII triggering event at least 95% of the time.
- Each surveillance message shall contain a time-stamp that is within 200 milliseconds from when the CII event triggering the surveillance message was detected.

The CaseIdentity and Conference-ID parameters provide correlation of all the CII messages and enable the LEA CF to properly process the encapsulated CC-APDU payload

## *6.1 Conference Focus CII Reporting Capabilities*

### 6.1.1 Conference-Started Message

The Conference-Started message reports the start of a Conference. The Conference starts when the first party is joined to the Conference. This event is reported when the first party is joined to the Conference.

**Table 1: Conference-Started Message Parameters**

| Conference-Started Parameters | MOC | Description |
|---|---|---|
| CaseIdentity | M | Identifies the lawful intercept. |
| IAPSystemIdentity | M | Identifies the network element containing the IAP. |
| TimeStamp | M | Identifies the date and time of this Conference event. |
| Conference-ID | M | Identifies the Conference. Used to correlate CII messages for the lawful intercept. |
| Conference-Parties | M | Identifies parties joined to the Conference. |
| CCAddress | C | Provide for content interception to identify the delivery address for the Call Content. |

### 6.1.2 Conference-Already-Started Message

The Conference-Already-Started message reports the start of an intercept on an active Conference. A Conference is active if there is at least one party joined to the Conference. This event is reported when an intercept is placed on an active Conference.

**Table 2: Conference-Already-Started Message Parameters**

| Conference-Already-Started Parameters | MOC | Description |
|---|---|---|
| CaseIdentity | M | Identifies the lawful intercept. |
| IAPSystemIdentity | M | Identifies the network element containing the IAP. |
| TimeStamp | M | Identifies the date and time of this Conference event. |
| Conference-ID | M | Identifies the Conference. Used to correlate CII messages for the lawful intercept. |
| Conference-Parties | M | Identifies parties joined to the Conference. |
| CCAddress | C | Provide for content interception to identify the delivery address for the Call Content. |

### 6.1.3 Conference-Stopped Message

The Conference-Stopped message reports the end of a Conference. A Conference ends when the last party leaves the Conference or the Conference is ended by other means (e.g., at the designated stop time of the Conference). This event is reported when the last party leaves a Conference or an active Conference is stopped.

**Table 3: Conference-Stopped Message Parameters**

| Conference-Stopped Parameters | MOC | Description |
|---|---|---|
| CaseIdentity | M | Identifies the lawful intercept. |
| IAPSystemIdentity | M | Identifies the network element containing the IAP. |
| TimeStamp | M | Identifies the date and time of this Conference event. |
| Conference-ID | M | Identifies the Conference. Used to correlate CII messages for the lawful intercept. |

### 6.1.4 Conference-Party-Invited Message

The Conference-Party-Invited message reports when a party (or parties) is invited or referred to the Conference. This event is reported when a party (or parties) is invited or referred to the Conference.

**Table 4: Conference-Party-Invited Message Parameters**

| Conference-Party-Invited Parameters | MOC | Description |
|---|---|---|
| CaseIdentity | M | Identifies the lawful intercept. |
| IAPSystemIdentity | M | Identifies the network element containing the IAP. |
| TimeStamp | M | Identifies the date and time of this Conference event. |
| Conference-ID | M | Identifies the Conference. Used to correlate CII messages for the lawful intercept. |
| Conference-Parties | M | Identifies parties invited or referred to the Conference. |

### 6.1.5 Conference-Party-Joined Message

The Conference-Party-Joined message reports parties joined to the Conference. It is not necessary to report parties joined to the Conference if those parties have already been reported by the Conference-Started or Conference-Already-Started message.

This event is reported when:

- A party (or parties) is joined to the Conference;
- A party drops and rejoins the Conference;
- A party that was placed on hold rejoins the Conference (i.e., retrieved from hold); or
- A party that was not previously reported by the Conference-Started or Conference-Already-Started message joins the Conference.

**Table 5: Conference-Party-Joined Message Parameters**

| Conference-Party-Joined Parameters | MOC | Description |
|---|---|---|
| CaseIdentity | M | Identifies the lawful intercept. |
| IAPSystemIdentity | M | Identifies the network element containing the IAP. |
| TimeStamp | M | Identifies the date and time of this Conference event. |
| Conference-ID | M | Identifies the Conference. Used to correlate CII messages for the lawful intercept. |
| Conference-Parties | M | Identifies parties joined to the Conference. |

### 6.1.6 Conference-Party-Dropped Message

The Conference-Party-Dropped message reports parties dropped from the Conference or placed on hold. This event is reported when a party (or parties) is dropped from the Conference, or when a party is placed on hold.

**Table 6: Conference-Party-Dropped Message Parameters**

| Conference-Party-Dropped Parameters | MOC | Description |
|---|---|---|
| CaseIdentity | M | Identifies the lawful intercept. |
| IAPSystemIdentity | M | Identifies the network element containing the IAP. |
| TimeStamp | M | Identifies the date and time of this Conference event. |
| Conference-ID | M | Identifies the Conference. Used to correlate CII messages for the lawful intercept. |
| Conference-Parties-Dropped | C | Identifies parties dropped from the Conference. |
| Conference-Parties-on-Hold | C | Identifies parties on hold from the Conference. |

### 6.1.7 Conference-Party-Invitation-Failed Message

The Conference-Party-Invitation-Failed message reports when the invitation to a party to the Conference has failed.

**Table 7: Conference-Party-Invitation-Failed Message Parameters**

| Conference-Party-Dropped Parameters | MOC | Description |
|---|---|---|
| CaseIdentity | M | Identifies the lawful intercept. |
| IAPSystemIdentity | M | Identifies the network element containing the IAP. |
| TimeStamp | M | Identifies the date and time of this Conference event. |
| Conference-ID | M | Identifies the Conference. Used to correlate CII messages for the lawful intercept. |
| Conference-Party | M | Identifies the party invited or referred to the Conference. |
| Failure-Reason | C | Identifies the reason for the failure of the invitation. |

# 7 LAES Call Content Surveillance Messages

While each Conference Party sends the Call Content packets to the Conference Mixer independently, the Telecommunications Service Provider (TSP) shall mix the Call Content of all Conference Parties and send this mixed Call Content to the LEA, when lawfully authorized. The interval to commence transmission of the intercepted Call Content packets from the Conference Mixer IAP towards the CF shall be limited to the computational delay of the IAP.

To transfer the intercepted Call Content packets from the Delivery Function (DF) to the Collection Function (CF), an Application Protocol Data unit (APDU) -- called the CCDelivery APDU (CC-APDU) -- is used to encapsulate the intercepted Call Content packets.

The CC-APDU consists of a CCDelivery Header and a CCDelivery Payload. The CC Delivery Payload contains the mixed Call Content packet.

The CC-APDU is generated when Call Content delivery is authorized and enabled.

Delivery of Call Content via CC-APDUs is dependent upon appropriate provisioning of the CC delivery interface.

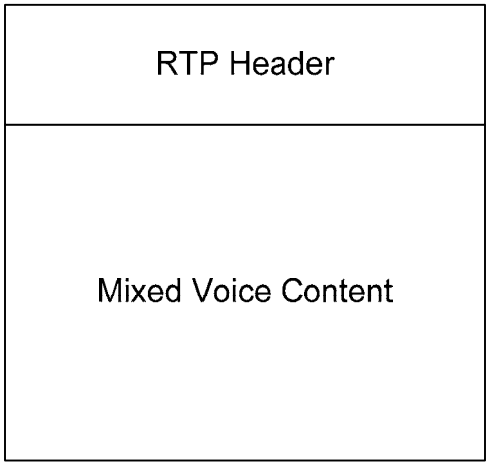
A CC-APDU shall be triggered for each Call Content packet to be delivered. The CC-APDU contains the following parameters:

**Table 8: CC-APDU Parameters**

| CC-APDU Parameters | MOC | Description |
|---|---|---|
| CaseIdentity | M | Identifies the lawful intercept. |
| IAPSystemIdentity | C | Identifies the network element containing the IAP. Include when known. |
| Conference-ID | M | Identifies the Conference. Used to correlate CC with CII messages for the lawful intercept. |
| Payload | M | CC-APDU payload (see Figure 3). |

The CaseIdentity and Conference-ID parameters provide correlation to the CII, enable correlation of the CC-APDUs associated with a media stream, and enable the LEA CF to properly process the encapsulated CC-APDU payload.

The CC-APDU payload includes the RTP header and the mixed voice content from all the Conference Parties. The RTP header defines the payload type.[5]




[5] If a non-standard payload type is used, this needs to be negotiated with the LEA.

**Figure 3: CC-APDU Payload**

# 8 Conferencing Abstract Syntax Notation

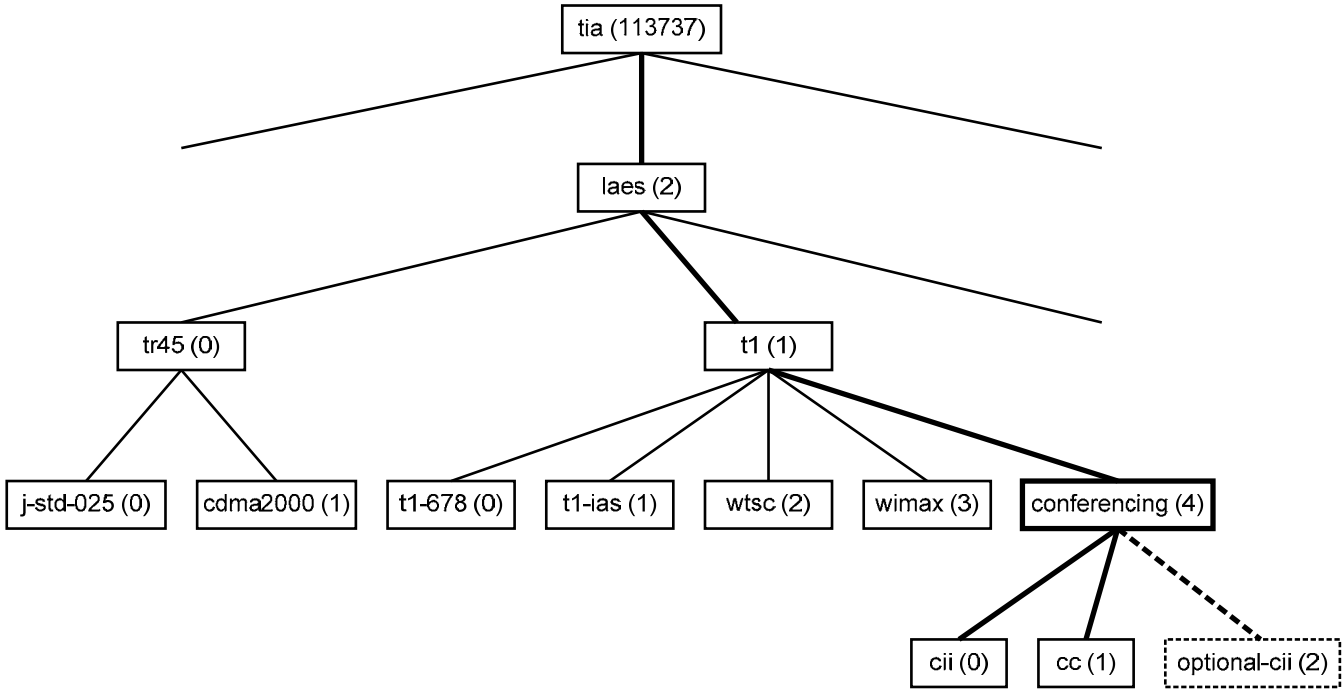



**Figure 4: LAES Object Tree**

## *8.1 Conferencing CII Abstract Syntax Module*

```
Conferencing-LAES-CII-Abstract-Syntax-Module
{iso(1) member-body(2) us(840) tia(113737) laes(2) t1(1) conferencing(4) cii(0) version-1(0)}

DEFINITIONS IMPLICIT TAGS ::=

BEGIN

IMPORTS

CaseIdentity, TimeStamp
FROM Laesp-j-std-025-b
{iso(1) member-body(2) us(840) tia(113737) laes(2) tr45(0) j-std-025(0) j-std-025-b(2)
version-1(0)}                                    -- Imports from J-STD-025-B Module

CCAddress, IAPSystemIdentity, PartyIdentity
FROM T1S1-LAES-VoP-Abstract-Syntax-Module
{iso(1) member-body(2) us(840) tia(113737) laes(2) t1(1) t1-678(0) cii(0) common (0) version-
4(3)};                           -- Imports from ATIS-1000678.b.2010 Module

conferencing-LAES-CII-Abstract-Syntax-Module-OID OBJECT IDENTIFIER ::=
{iso(1) member-body(2) us(840) tia(113737) laes(2) t1(1) conferencing(4) cii(0) version-1(0)}

conferencing-CII-Protocol-Identifier OBJECT IDENTIFIER ::=
{conferencing-LAES-CII-Abstract-Syntax-Module-OID}
```

```
ConferencingProtocol ::= SEQUENCE
{
   conferencing-CII-Protocol-Identifier [0] OBJECT IDENTIFIER,
   conferencing-Message                 [1] Conferencing-Message
}

Conferencing-Message ::= CHOICE {
    conference-Started                  [0] Conference-Started,
    conference-Already-Started          [1] Conference-Already-Started,
    conference-Stopped                  [2] Conference-Stopped,
    conference-Party-Invited            [3] Conference-Party-Invited,
    conference-Party-Joined             [4] Conference-Party-Joined,
    conference-Party-Dropped            [5] Conference-Party-Dropped,
    conference-Party-Invited-Failed     [6] Conference-Party-Invited-Failed,
    ...
}

-- Message Definitions

Conference-Started ::= SEQUENCE {
     caseId                [0] CaseIdentity,
     iAPSystemIdentity     [1] IAPSystemIdentity,
     timestamp             [2] TimeStamp,
     conference-ID         [3] Conference-ID,
     conference-Parties    [4] SET OF Conference-Party,
     ccAddress             [5] CCAddress                    OPTIONAL,
     ...
}

Conference-Already-Started ::= SEQUENCE {
     caseId                [0] CaseIdentity,
     iAPSystemIdentity     [1] IAPSystemIdentity,
     timestamp             [2] TimeStamp,
     conference-ID         [3] Conference-ID,
     conference-Parties    [4] SET OF Conference-Party,
     ccAddress             [5] CCAddress                    OPTIONAL,
     ...
}

Conference-Stopped ::= SEQUENCE {
     caseId                [0] CaseIdentity,
     iAPSystemIdentity     [1] IAPSystemIdentity,
     timestamp             [2] TimeStamp,
     conference-ID         [3] Conference-ID,
     ...
}

Conference-Party-Invited ::= SEQUENCE  {
     caseId                [0] CaseIdentity,
     iAPSystemIdentity     [1] IAPSystemIdentity,
     timestamp             [2] TimeStamp,
     conference-ID         [3] Conference-ID,
     conference-Parties    [4] SET OF Conference-Party,
     ...
}

Conference-Party-Joined ::= SEQUENCE {
     caseId                [0] CaseIdentity,
     iAPSystemIdentity     [1] IAPSystemIdentity,
     timestamp             [2] TimeStamp,
     conference-ID         [3] Conference-ID,
     conference-Parties    [4] SET OF Conference-Party,
     ...
}
```

```
Conference-Party-Dropped ::= SEQUENCE {
     caseId               [0] CaseIdentity,
     iAPSystemIdentity    [1] IAPSystemIdentity,
     timestamp            [2] TimeStamp,
     conference-ID        [3] Conference-ID,
     conference-Parties-Dropped  [4] SET OF Conference-Party      OPTIONAL,
     conference-Parties-on-Hold  [5] SET OF Conference-Party      OPTIONAL,
     ...
}

Conference-Party-Invited-Failed ::= SEQUENCE  {
     caseId               [0] CaseIdentity,
     iAPSystemIdentity    [1] IAPSystemIdentity,
     timestamp            [2] TimeStamp,
     conference-ID        [3] Conference-ID,
     conference-Party     [4] Conference-Party,
     failure-reason       [5] Failure-Reason              OPTIONAL,
     ...
}

-- Parameter Definitions

Conference-ID ::= UTF8String

Conference-Party ::= PartyIdentity

Failure-Reason ::= UTF8String

END  -- of Conferencing-LAES-CII-Abstract-Syntax-Module
```

## 8.2 Conferencing CC Abstract Syntax Module

```
Conferencing-LAES-CC-Abstract-Syntax-Module
{iso(1) member-body(2) us(840) tia(113737) laes(2) t1(1) conferencing(4) cc(1) version-1(0)}

DEFINITIONS IMPLICIT TAGS ::=

BEGIN

IMPORTS

CaseIdentity
FROM Laesp-j-std-025-b
{iso(1) member-body(2) us(840) tia(113737) laes(2) tr45(0) j-std-025(0) j-std-025-b(2)
version-1(0)}                                   -- Imports from J-STD-025-B Module

IAPSystemIdentity
FROM T1S1-LAES-VoP-Abstract-Syntax-Module
{iso(1) member-body(2) us(840) tia(113737) laes(2) t1(1) t1-678(0) cii(0) common (0) version-
4(3);                                           -- Imports from ATIS-1000678.b.2010 Module

Conference-ID
FROM Conferencing-LAES-CII-Abstract-Syntax-Module
{iso(1) member-body(2) us(840) tia(113737) laes(2) t1(1) conferencing(4) cii(0) version-
1(0)};

conferencing-CC-Protocol-ID OBJECT IDENTIFIER ::=
{iso(1) member-body(2) us(840) tia(113737) laes(2) t1(1) conferencing(4) cc(1) version-1(0)}


Conferencing-CC-APDU ::= SEQUENCE
{
     conferencing-CC-Protocol-ID [0] OBJECT IDENTIFIER,
```

```
     cc-APDU                    [1] CC-APDU,
     ...
}


CC-APDU ::= SEQUENCE
{
     caseID               [0] CaseIdentity,
     iAPSystemIdentity    [1] IAPSystemIdentity                  OPTIONAL,
     conference-ID        [2] Conference-ID,
     payload              [3] OCTET STRING
}

END  -- of Conferencing-LAES-CC-Abstract-Syntax-Module
```

**Annex A**
(informative)

# A Conference Manager Reporting of Optional-CII

This annex is informative.

Conference Manager reporting of CII is an optional LAES function for Advanced Conferencing.

The Conference Manager IAP may report the following CII when known:

- Conference reservation creation.
- Conference reservation already created.
- Conference reservation updates.
- Conference reservation deletion.

The messages that report these events are shown as Optional-CII in Figure 2.

The CaseIdentity and Conference-ID parameters provide correlation of all the CII messages and enable the LEA CF to properly process the encapsulated CC-APDU payload

## *A.1 Conference Manager Reporting of Optional-CII*

### A.1.1 Conference-Reservation-Created Message[6]

The Conference-Reservation-Created message reports the creation of the Conference reservation. This event is reported when the Conference reservation is created.

**Table 9: Conference-Reservation-Created Message Parameters**

| Conference-Reservation-Created Parameters | MOC | Description |
|---|---|---|
| CaseIdentity | M | Identifies the lawful intercept. |
| IAPSystemIdentity | M | Identifies the network element containing the IAP. |
| TimeStamp | M | Identifies the date and time of this Conference event. |
| Conference-ID | M | Identifies the Conference. Used to correlate CII messages for the lawful intercept. |
| Conference-Requesting-Party | M | Identifies the party requesting creation of the Conference reservation. |
| Potential-Conference-Parties | C | Identifies the Conference Parties listed in the Conference Manager reservation list. Provide if reasonably available. |
| Conference-Start-Time | C | Identifies the Conference start date and time. Provide if available. |
| Conference-Stop-Time | C | Identifies the Conference stop date and time. Provide if available. |
| Recurrence-Information | C | Identifies the frequency of the Conference. Provide if available. |

[6] The Conference-Reservation-Created message is not applicable when the conference itself is the target of the lawful intercept (i.e., to intercept the communications of a conference identified by a proper identity in the lawful authorization).

### A.1.2 Conference-Reservation-Updated Message

The Conference-Reservation-Updated message reports changes to the Conference reservation. This event is reported when the Conference reservation has changed.

**Table 10: Conference-Reservation-Updated Message Parameters**

| Conference-Reservation-Updated Parameters | MOC | Description |
|---|---|---|
| CaseIdentity | M | Identifies the lawful intercept. |
| IAPSystemIdentity | M | Identifies the network element containing the IAP. |
| TimeStamp | M | Identifies the date and time of this Conference event. |
| Conference-ID | M | Identifies the Conference. Used to correlate CII messages for the lawful intercept. |
| Conference-Requesting-Party | M | Identifies the party requesting changes to the Conference reservation. |
| Potential-Conference-Parties | C | Identifies the Conference Parties that are listed in the Conference Manager reservation list. Provide if reasonably available. |
| Conference-Start-Time | C | Identifies the Conference start date and time. Provide if available. |
| Conference-Stop-Time | C | Identifies the Conference stop date and time. Provide if available. |
| Recurrence-Information | C | Identifies the frequency of the Conference. Provide if available. |

### A.1.3 Conference-Reservation-Deleted Message

The Conference-Reservation-Deleted message reports the deletion of the Conference reservation. This event is reported when the Conference reservation has been deleted.

**Table 11: Conference-Reservation-Deleted Message Parameters**

| Conference-Reservation-Deleted Parameters | MOC | Description |
|---|---|---|
| CaseIdentity | M | Identifies the lawful intercept. |
| IAPSystemIdentity | M | Identifies the network element containing the IAP. |
| TimeStamp | M | Identifies the date and time of this Conference event. |
| Conference-ID | M | Identifies the Conference. Used to correlate CII messages for the lawful intercept. |
| Conference-Requesting-Party | M | Identifies the party requesting deletion of the Conference reservation. |

### A.1.4 Conference-Reservation-Already-Created Message

The Conference-Reservation-Already-Created message reports a Conference that has already been created. This event is reported when an interception is activated on an active conference reservation.

**Table 12: Conference-Reservation-Already-Created Message Parameters**

| Conference-Reservation-Already-Created Parameters | MOC | Description |
|---|---|---|
| CaseIdentity | M | Identifies the lawful intercept. |
| IAPSystemIdentity | M | Identifies the network element containing the IAP. |
| TimeStamp | M | Identifies the date and time of this Conference event. |
| Conference-ID | M | Identifies the Conference. Used to correlate CII messages for the lawful intercept. |
| Conference-Requesting-Party | M | Identifies the party that had requested changes to the Conference reservation. |
| Potential-Conference-Parties | C | Identifies the Conference Parties that are listed in the Conference Manager reservation list. Provide if reasonably available. |
| Conference-Start-Time | C | Identifies the Conference start date and time. Provide if available. |
| Conference-Stop-Time | C | Identifies the Conference stop date and time. Provide if available. |
| Recurrence-Information | C | Identifies the frequency of the Conference. Provide if available. |

## *A.2 Conference Manager Optional-CII Reporting Abstract Syntax Module*

```
Conferencing-LAES-Optional-CII-Abstract-Syntax-Module
{iso(1) member-body(2) us(840) tia(113737) laes(2) t1(1) conferencing(4) optional-cii(2)
version-1(0)}

DEFINITIONS IMPLICIT TAGS ::=

BEGIN

IMPORTS

CaseIdentity, TimeStamp
FROM Laesp-j-std-025-b
{iso(1) member-body(2) us(840) tia(113737) laes(2) tr45(0) j-std-025(0) j-std-025-b(2)
version-1(0)}                                   -- Imports from J-STD-025-B Module

IAPSystemIdentity, PartyIdentity
FROM T1S1-LAES-VoP-Abstract-Syntax-Module
{iso(1) member-body(2) us(840) tia(113737) laes(2) t1(1) t1-678(0) cii(0) common (0) version-
4(3)}                                           -- Imports from ATIS-1000678.b.2010 Module

Conference-ID
FROM Conferencing-LAES-CII-Abstract-Syntax-Module
{iso(1) member-body(2) us(840) tia(113737) laes(2) t1(1) conferencing(4) cii(0) version-
1(0)};

conferencing-Optional-CII-Protocol-Identifier OBJECT IDENTIFIER ::=
{iso(1) member-body(2) us(840) tia(113737) laes(2) t1(1) conferencing(4) optional-cii(2)
version-1(0)}
```

```
ConferencingOptionalProtocol ::= SEQUENCE
{
   conferencing-Optional-CII-Protocol-Identifier     [0] OBJECT IDENTIFIER,
   conferencing-Optional-Message                     [1] Conferencing-Optional-Message
}

Conferencing-Optional-Message ::= CHOICE {
    conference-Reservation-Created            [0] Conference-Reservation-Created,
    conference-Reservation-Updated            [1] Conference-Reservation-Updated,
    conference-Reservation-Deleted            [2] Conference-Reservation-Deleted,
    conference-Reservation-Already-Created    [3] Conference-Reservation-Already-Created,
    ...
}

-- Message Definitions

Conference-Reservation-Created ::= SEQUENCE {
     caseId                      [0] CaseIdentity,
     iAPSystemIdentity           [1] IAPSystemIdentity,
     timestamp                   [2] TimeStamp,
     conference-ID               [3] Conference-ID,
     conference-Requesting-Party [4] PartyIdentity,
     potential-Conference-Parties[5] Potential-Conferees          OPTIONAL,
     conference-Start-Time       [6] Conference-Start-Time        OPTIONAL,
     conference-Stop-Time        [7] Conference-Stop-Time         OPTIONAL,
     recurrence-Info             [8] Recurrence-Information       OPTIONAL,
     ...
}

Conference-Reservation-Updated ::= SEQUENCE {
     caseId                      [0] CaseIdentity,
     iAPSystemIdentity           [1] IAPSystemIdentity,
     timestamp                   [2] TimeStamp,
     conference-ID               [3] Conference-ID,
     conference-Requesting-Party [4] PartyIdentity,
     potential-Conference-Parties[5] Potential-Conferees          OPTIONAL,
     conference-Start-Time       [6] Conference-Start-Time        OPTIONAL,
     conference-Stop-Time        [7] Conference-Stop-Time,        OPTIONAL
     recurrence-Info             [8] Recurrence-Information       OPTIONAL,
     ...
}

Conference-Reservation-Deleted ::= SEQUENCE {
     caseId                      [0] CaseIdentity,
     iAPSystemIdentity           [1] IAPSystemIdentity,
     timestamp                   [2] TimeStamp,
     conference-ID               [3] Conference-ID,
     conference-Requesting-Party [4] PartyIdentity,
     ...
}
Conference-Reservation-Already-Created ::= SEQUENCE {
     caseId                      [0] CaseIdentity,
     iAPSystemIdentity           [1] IAPSystemIdentity,
     timestamp                   [2] TimeStamp,
     conference-ID               [3] Conference-ID,
     conference-Requesting-Party [4] PartyIdentity,
     potential-Conference-Parties[5] Potential-Conferees          OPTIONAL,
     conference-Start-Time       [6] Conference-Start-Time        OPTIONAL,
     conference-Stop-Time        [7] Conference-Stop-Time         OPTIONAL,
     recurrence-Info             [8] Recurrence-Information       OPTIONAL,
     ...
}


-- Parameter Definitions
```

```
Potential-Conferees ::= SET OF PartyIdentity

Conference-Start-Time ::= GeneralizedTime

Conference-Stop-Time ::= GeneralizedTime

Recurrence-Information ::= SEQUENCE
{
     recurrence-Start      [1] Recurrence-Time,
     recurrence-Stop       [2] Recurrence-Time,
     recurrence-Pattern    [3] UTF8String                   OPTIONAL,     -- e.g., 'Weekly',
'Monthly', 'Every Tuesday'
     ...
}

Recurrence-Time ::= CHOICE
{
     recurrence-Time       [1] GeneralizedTime,
     unknown               [2] NULL,
     ...
{

END  -- of Conferencing-LAES-Optional-CII-Abstract-Syntax-Module
```

**Annex B**
(informative)

# B Example Information Flows

This annex is informative.

This annex provides example information flows and associated LAES reporting. This annex is not intended to be an exhaustive description of all possible information flows and associated LAES reporting for advanced VoP conferencing services.

> NOTE: The Conference Manager and Conference Focus are shown in the figures as separate entities. However, they may be implemented in one entity. The dashed box around the Conference Manager and Conference Focus is intended to show that they may be a single entity. This has no effect on the LAES reporting.

## *B.1 Creation, Update, & Deletion of a Conference*

The Intercept Subject requests the Conference Manager to create a Conference reservation. A start and stop time period is specified for the duration of the Conference. The Intercept Subject subsequently updates the Conference reservation with a new list of Conference Parties to the Conference and a new start and stop time period. At some time later, the Intercept Subject deletes the Conference reservation.

Figure 5 shows the Intercept Subject sending instructions to the Conference Manager for creating a Conference reservation, followed by sending updates for the Conference reservation, and finally deleting the Conference reservation.

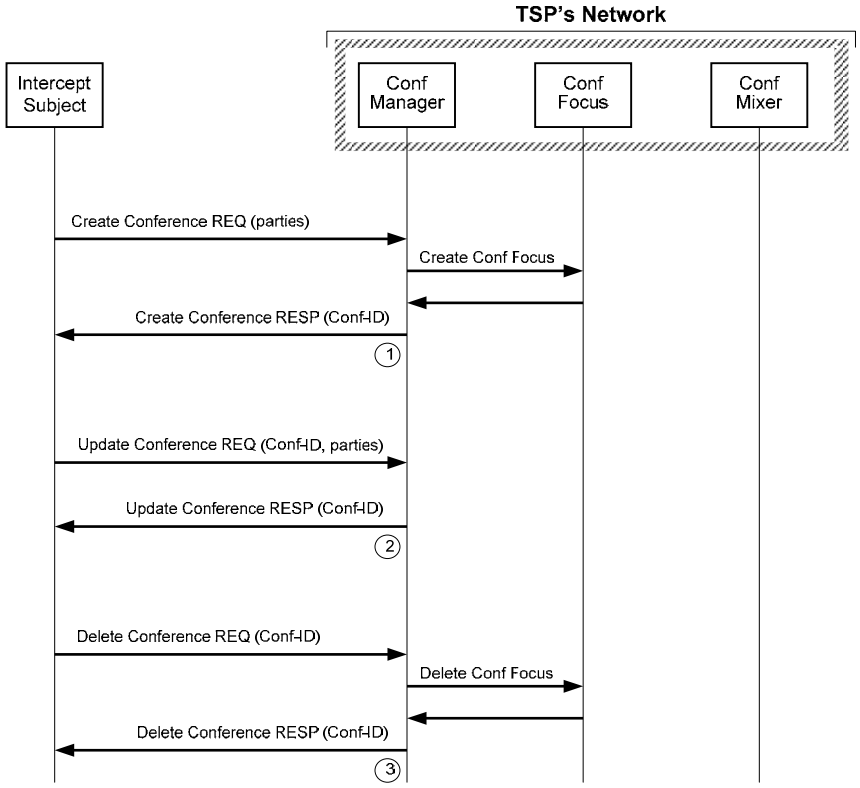



**Figure 5: Creation, Update, and Deletion of a Conference Reservation**

1. *The Intercept Subject sends a create Conference request to the Conference Manager*. The request includes parties to invite to the Conference (the invited parties may or may not include the Intercept Subject). A start and stop time period is specified for the Conference. The Conference Manager accepts the request and responds with the Conference Identifier (Conf-ID). An LAES **Conference-Reservation-Created** message is sent to the LEA(s) indicating that the Conference reservation has been created.
2. *Subsequent to the creation of the Intercept Subject's Conference reservation, the Intercept Subject sends an update Conference request to the Conference Manager*. The update request provides an updated list of parties to the Conference. The Conference Manager accepts the request and responds with the Conference Identifier (Conf-ID). An LAES **Conference-Reservation-Updated** message is sent to the LEA(s) indicating that the Conference reservation has been updated.
3. *At some time later, the Intercept Subject sends a delete Conference request to the Conference Manager*. The Conference Manager accepts the delete request and responds with the Conference Identifier (Conf-ID). An LAES **Conference-Reservation-Deleted** message is sent to the LEA(s) indicating that the Conference reservation has been deleted.

## *B.2 Conference Focus Invites Conference Parties to a Conference*

The Conference Manager notifies the Conference Focus to start the Conference. The Conference Focus invites Conference Party-1 to join the Conference and Conference Party-1 joins the Conference as the first party to the Conference. Conference Party-1's RTP communication stream is connected to the Conference Mixer. The Conference Focus then invites Conference Party-2 to join the Conference. Conference Party-2 accepts the invitation and is joined to the Conference. Conference Party-2's RTP communication stream is connected to the Conference Mixer. Other Conference Parties may be invited to and join the Conference in a similar manner. The Conference reaches the Conference stop time and the Conference Focus removes Conference Party-2 and Conference Party-1 from the Conference and the Conference ends.

Figure 6 shows the Conference Manager notifying the Conference Focus to invite Conference Parties to a Conference and to start the Conference. Note that Figure 6 shows only two parties (Conference Party-1 and Conference Party-2) being invited to and joining the Conference; however, other Conference Parties may be invited to and may join the Conference in a similar manner with the same LAES reporting.

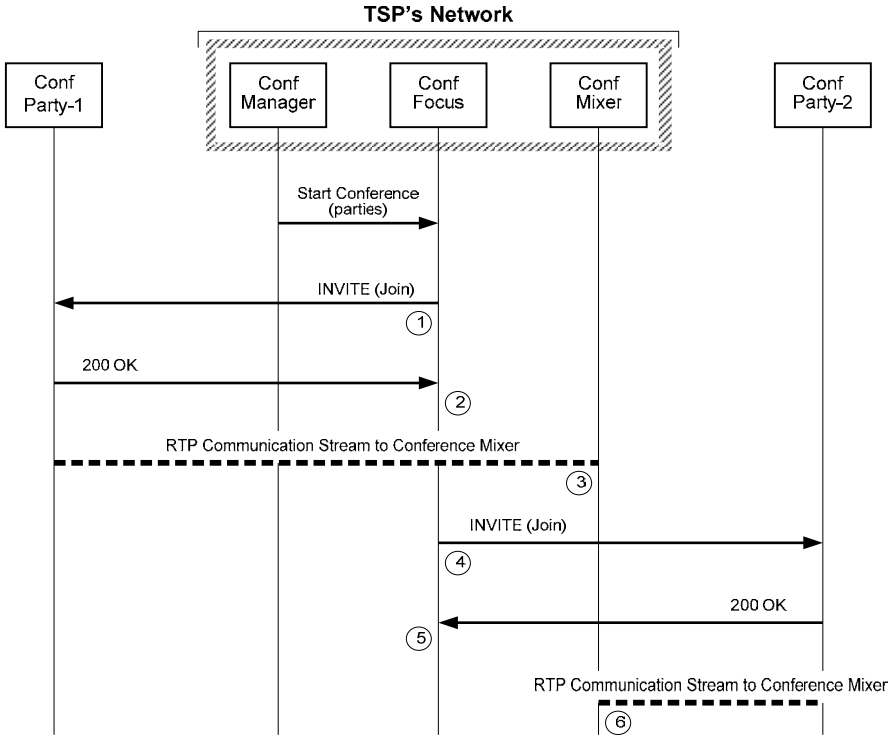



**Figure 6: Conference Focus Invites Conference Parties to a Conference**

1. *The Conference Manager notifies the Conference Focus to start the Conference*. The Conference Focus invites Conference Party-1 to join the Conference. An LAES **Conference-Party-Invited** message is sent to the LEA(s).
2. *Conference Party-1 joins the Conference as the first party to the Conference*. An LAES **Conference-Started** message is sent to the LEA(s).
3. *Conference Party-1's RTP communication stream is connected to the Conference Mixer*. Call Content interception starts, when lawfully authorized.
4. *The Conference Focus then invites Conference Party-2 to join the Conference*. An LAES **Conference-Party-Invited** message is sent to the LEA(s).
5. *Conference Party-2 accepts the invitation and is joined to the Conference*. An LAES **Conference-Party-Joined** message is sent to the LEA(s).
6. *Conference Party-2's RTP communication stream is connected to the Conference Mixer*. Call Content continues to be intercepted, when lawfully authorized.

In Figure 6, the Conference invitation process begins with the Conference Focus inviting Conference Party-1 and then Conference Party-2 to join the Conference. Note that Conference Focus may invite the Intercept Subject as the first party to join the conference or as a subsequent party. The call flow would appear the same.

Figure 7 shows the Conference Focus dropping Conference Parties and the Conferencing ending. Note that Figure 7 shows only Conference Party-1 and Conference Party-2 being dropped from the Conference; however, other Conference Parties will also be dropped from the Conference in a similar manner with the same LAES reporting.

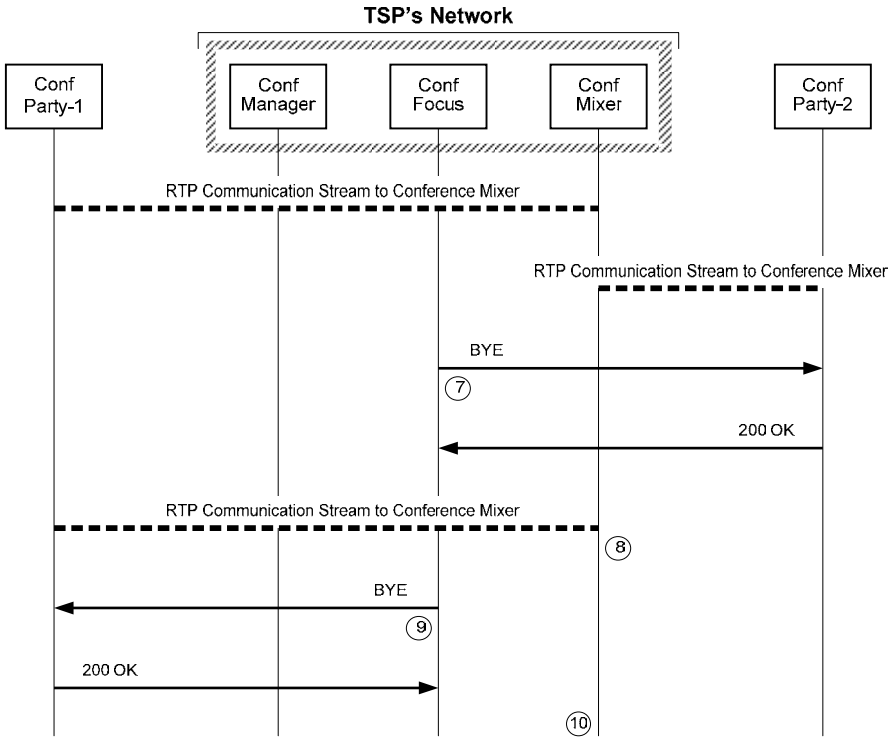



**Figure 7: Conference Parties Dropped and Conference Stops**

7. *The stop time for the Conference is reached and the Conference Focus drops Conference Party-2 from the Conference*. An LAES **Conference-Party-Dropped** message is sent to the LEA(s).
8. *Conference Party-2's RTP communication stream is disconnected from the Conference Mixer*. Call Content interception continues with Conference Party-1's Call Content.
9. *The Conference Focus drops the Conference Party-1 from the Conference*. An LAES **Conference-Party-Dropped** message is sent to the LEA(s).

   The Conference ends when the last party leaves the Conference. An LAES **Conference-Stopped** message is sent to the LEA(s).
10. *Conference Party-1's RTP communication stream is disconnected from the Conference Mixer and Conference Call Content interception stops*.

## *B.3 Intercept Subject and Conference Party Request to Join a Conference*

The Conference Manager starts a Conference per the Intercept Subject's instructions. Information on how to join the Conference is sent to the Conference Parties (not shown in Figure 8). Subsequently, the Intercept Subject sends a request to join the Conference. Conference Party-2 then joins the Conference. Conference Party-2 and the Intercept Subject then drop from the Conference and the Conference ends.

Figure 8 shows a Conference starting and the Intercept Subject and a Conference Party joining the Conference. Note that Figure 8 shows only the Intercept Subject and Conference Party-2 requests to join and then being joined to the Conference; however, other Conference Parties may request to join and may then be joined to the Conference in a similar manner with the same LAES reporting.

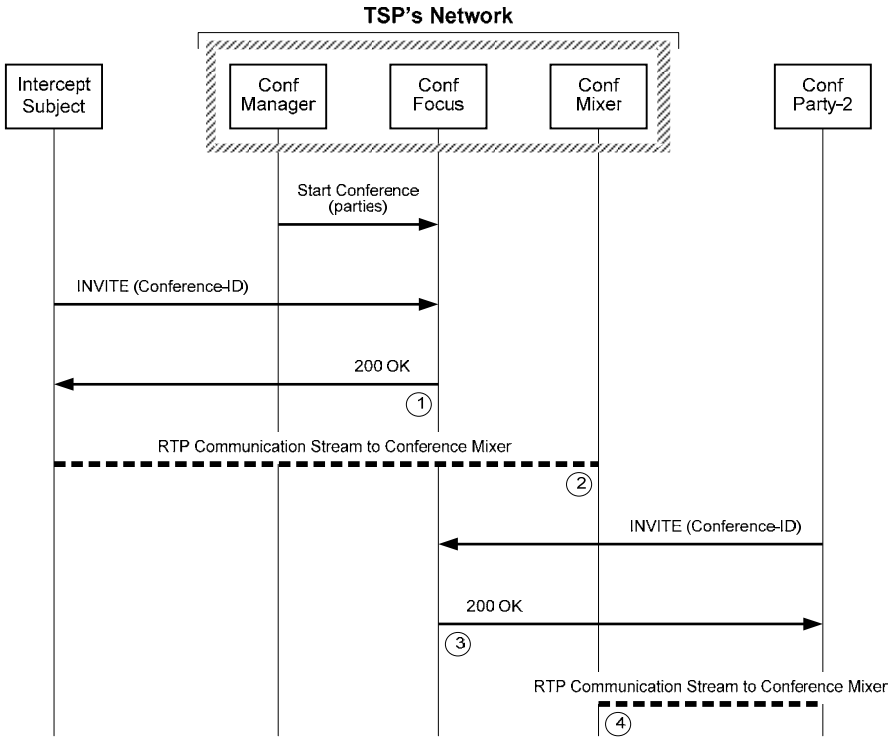



**Figure 8: Intercept Subject and Conference Party Join a Conference**

1. *The Conference Manager starts a Conference Focus for a Conference per the Intercept Subject's previous instructions*. Subsequently the Intercept Subject sends a request to join the Conference. An LAES **Conference-Started** message is sent to the LEA(s).
2. *The Intercept Subject's RTP communication stream is connected to the Conference Mixer*. Call Content interception starts.
3. *Conference Party-2 sends a request to join the Conference*. The request is accepted and Conference Party-2 is joined to the Conference. An LAES **Conference-Party-Joined** message is sent to the LEA(s).
4. *Conference Party-2's RTP communication stream is connected to the Conference Mixer*. Call Content continues to be intercepted.

Figure 9 shows the Intercept Subject and a Conference Party-2 dropping from the Conference. Note that Figure 9 shows only the Intercept Subject and Conference Party-2 requests to drop and being dropped from the Conference; however, other Conference Parties will also be dropped from the Conference in a similar manner with the same LAES reporting.

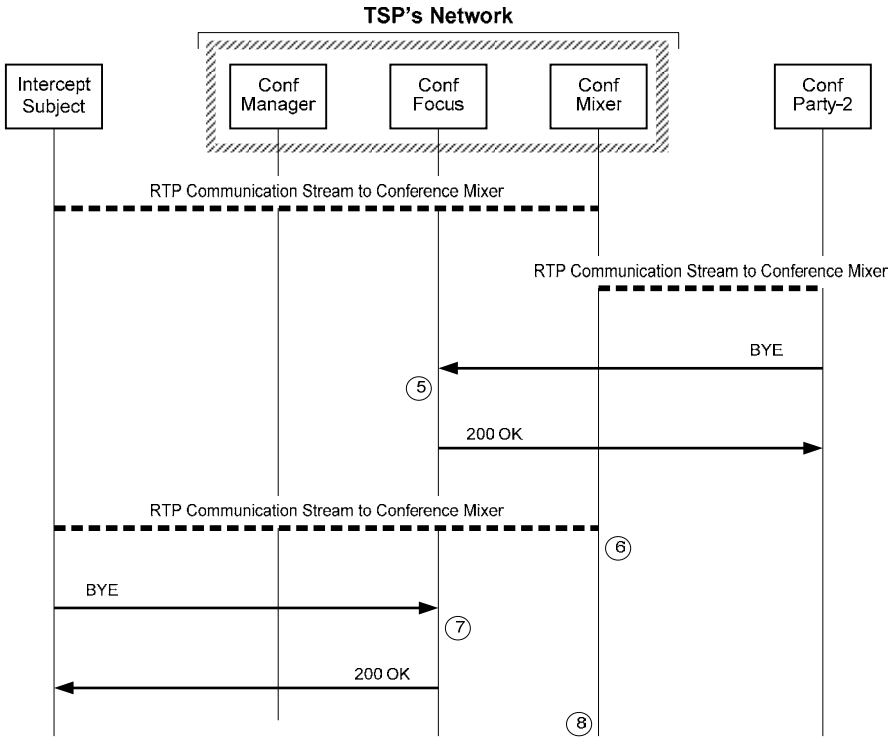



**Figure 9: Conference Party and Intercept Subject Drop from the Conference**

5. *Conference Party-2 drops from the Conference*. An LAES **Conference-Party-Dropped** message is sent to the LEA(s).
6. *Conference Party-2's RTP communication stream is disconnected from the Conference Mixer*. Call Content interception continues with the Intercept Subject's Call Content.
7. *The Intercept Subject drops from the Conference*. An LAES **Conference-Party-Dropped** message is sent to the LEA(s). The Conference ends. An LAES **Conference-Stopped** message is sent to the LEA(s).
8. *The Intercept Subject's RTP communication stream is disconnected from the Conference Mixer and Call Content interception stops*.

## *B.4 Two Conference Parties Join a Conference Call*

The Conference Manager starts a Conference per the Intercept Subject's instructions. A Conference Party sends a request to join the Conference. Later, another Conference Party joins the Conference. Both Conference Parties drop out of the Conference.

Figure 10 shows a scenario where Conference Party-1 and Conference Party-2 join the Conference and the Conference Requestor (i.e., Intercept Subject) never joins the Conference. The Conference begins when the first party joins the Conference.

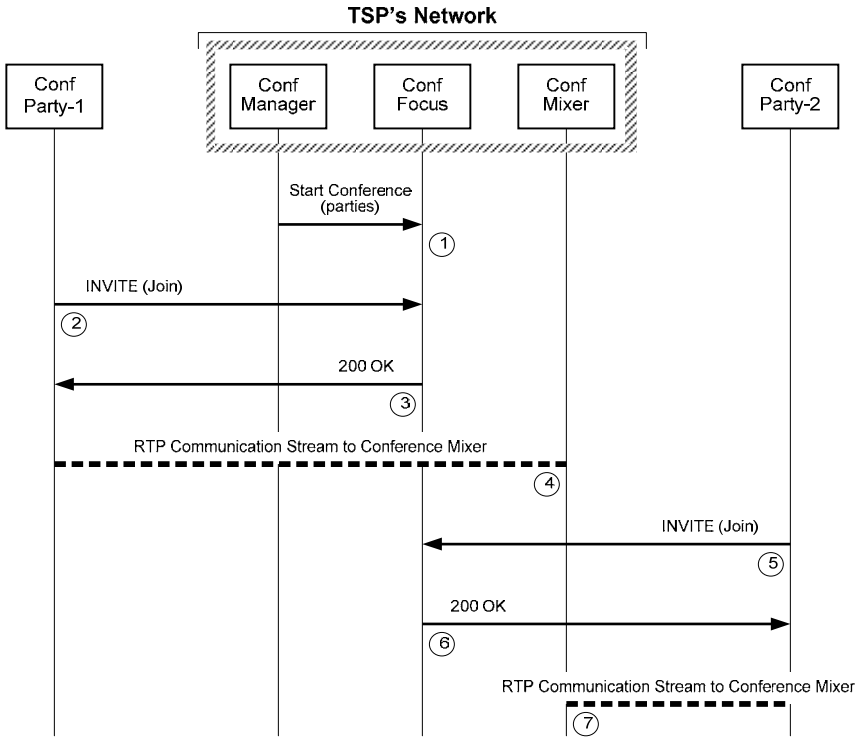



**Figure 10: Conference Parties Join a Conference**

1. *The Conference Manager starts a Conference Focus for a Conference per the Intercept Subject's previous instructions*.
2. *Subsequently, a conference party (Conference Party-1) sends a request to join the Conference*.
3. *The Conference begins when the first party joins the Conference -- i.e., when Conference Party-1 joins the Conference*. An LAES **Conference-Started** message is sent to the LEA(s).
4. *Conference Party-1's RTP communication stream is connected to the Conference Mixer*. Call Content interception starts.
5. *Conference Party-2 sends a request to join the Conference*.
6. *The request is accepted and Conference Party-2 is joined to the Conference*. An LAES **Conference-Party-Joined** message is sent to the LEA(s).
7. *Conference Party-2's RTP communication stream is connected to the Conference Mixer*. Call Content continues to be intercepted.

Figure 11 shows both Conference Parties (first Conference Party-2 and then Conference Party-1) dropping from the Conference. The Conference ends when the last conference party leaves the Conference.

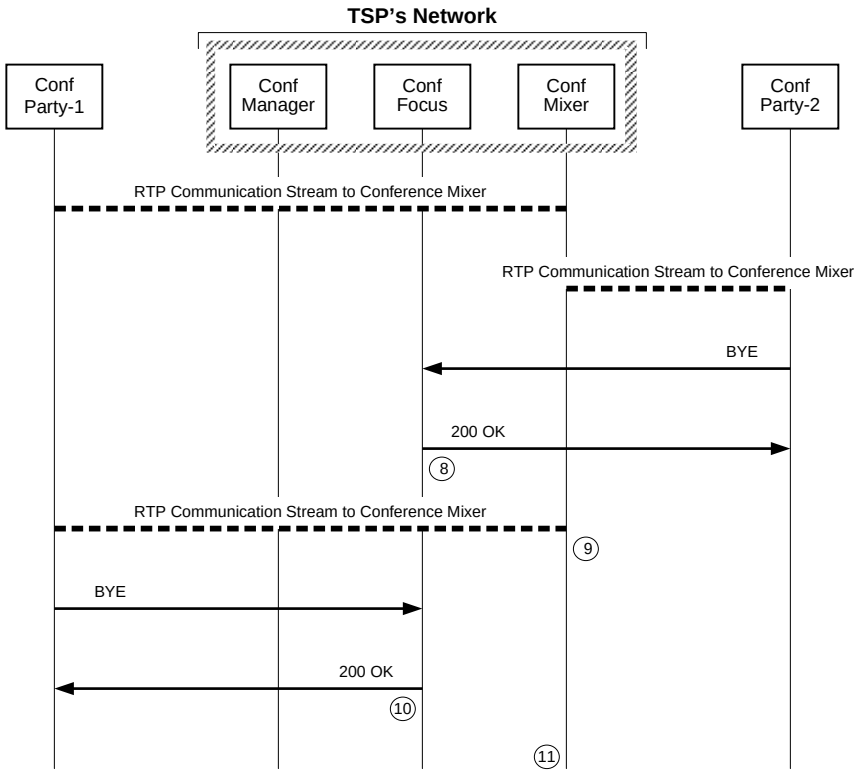



**Figure 11: Conference Parties Drop from the Conference and Conference Ends**

8. *Conference Party-2 drops from the Conference*. An LAES **Conference-Party-Dropped** message is sent to the LEA(s).
9. *Conference Party-2's RTP communication stream is disconnected from the Conference Mixer*. Call Content interception continues with Conference Party-1's Call Content.
10. *Conference Party-1 drops from the Conference and is the last party to leave*. The Conference ends when the last conference party leaves, and therefore an LAES **Conference-Stopped** message is sent to the LEA(s).
11. *Conference Party-1's RTP communication stream is disconnected from the Conference Mixer and Call Content interception stops*.