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TECHNICAL SPECIFICATION

Lawful Interception (LI);
Handover Interface and
Service-Specific Details (SSD) for IP delivery;
Part 6: Service-specific details for PSTN/ISDN services

Reference

RTS/LI-00236-6

Keywords

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Lawful Interception (LI).

The present document is part 6 of a multi-part deliverable. Full details of the entire series can be found in part 1 [2].

The ASN.1 module is available as an electronic attachment to the present document (see clause A.2 for more details).

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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1 Scope

The present document contains service-specific details for the handover of the lawfully intercepted PSTN/ISDN Services (including emulated services such as those defined in ETSI ES 282 002 [i.3]) using packet-based techniques as defined in ETSI TS 102 232-1 [2].

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 101 671: "Lawful Interception (LI); Handover interface for the lawful interception of telecommunications traffic".

NOTE: ETSI TS 101 671 is in status "historical" and is not maintained.

[2] ETSI TS 102 232-1: "Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 1: Handover specification for IP delivery".

[3] Void.

[4] Void.

[5] Void.

[6] Recommendation ITU-T G.711 (1988): "Pulse code modulation (PCM) of voice frequencies".

[7] IETF RFC 4566: "SDP: Session Description Protocol".

[8] ETSI TS 187 005: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Lawful Interception; Stage 1 and Stage 2 definition".

[9] Void.

[10] IETF RFC 3551: "RTP Profile for Audio and Video Conferences with Minimal Control".

[11] Recommendation ITU-T T.38: "Procedures for real-time Group 3 facsimile communication over IP networks".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI TR 102 053: "Telecommunications security; Lawful Interception (LI); Notes on ISDN lawful interception functionality".

[i.2] ETSI TR 102 503: "Lawful Interception (LI); ASN.1 Object Identifiers in Lawful Interception and Retained data handling Specifications".

[i.3] ETSI ES 282 002: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN Emulation Sub-system (PES); Functional architecture".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI TS 102 232-1 [2] and ETSI TS 101 671 [1] apply.

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ASN.1	Abstract Syntax Notation One
CC	Content of Communication
CIN	Communications Identity Number
CR	Change Request
CSP	Communications Service Provider

NOTE: CSP covers all Access Providers, Network Operators and Service Providers.

IP	Internet Protocol
IRI	Intercept Related Information
ISDN	Integrated Services Digital Network
ITU-T	International Telecommunication Union - Telecommunication standardization sector
LEA	Law Enforcement Agency
LEMF	Law Enforcement Monitoring Facility
LI	Lawful Interception
NGN	Next Generation Network
OID	Object IDentifier
PDU	Protocol Data Unit
PSTN	Public Switched Telephone Network
RTP	Real-time Transport Protocol
SDP	Session Description Protocol
TC	Technical Committee

UDP   User Datagram Protocol
UDPTL   Facsimile UDP Transport Layer (protocol)

4   General

4.1   Approach

The present document forms part 6 of the ETSI TS 102 232 family of standards, in that it is a service-specific component of the ETSI TS 102 232-1 [2] framework.

For ISDN interception ETSI TS 101 671 [1] defines the interception behaviour that leads to visible IRI events on the handover interface. ETSI TR 102 053 [i.1] provides detailed guidance in support of ETSI TS 101 671 [1].

The present document provides a model for handover that may be used in conjunction with the interception domain specification ETSI TS 187 005 [8]. ETSI TS 187 005 [8] also provides a context for the present document within the NGN LI domain.

4.2   Reference model
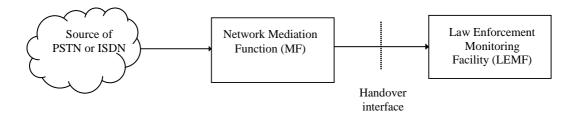

Figure 1: Reference model

5   Headers, data exchange and networks

5.1   Approach

ETSI TS 102 232-1 [2] describes a technique for data exchange and specifies the headers that shall be associated with the results of interception. The present document follows ETSI TS 102 232-1 [2] regarding headers, data exchange and networks.

5.2   Structures

IRI events from ETSI TS 101 671 [1] are sent using the structure ETSI671IRI. Supplementary information IRI (defined in clause 6.3) is sent using the structure pstnIsdnIRI and/or the structure pstnIsdnCC (see clause A.2). CC is sent using the structure pstnIsdnCC (see clause 6.2).

5.3   Definition of a communications session

A new Communications Identity Number (or CIN) is assigned each time a new communications session begins. See ETSI TS 101 671 [1] for the definition of communications session.

Typically, a new communications session is defined to begin (i.e. a new CIN is assigned) when each IRI-BEGIN message is sent (as listed in ETSI TS 101 671 [1]), then all further IRI and CC relating to that session has the same CIN. Typically, a REPORT record would form a communications session in its own right. If CC or an IRI record is generated for a session before the IRI-BEGIN is sent (e.g. through fault situations, or owing to unexpected latency), the CSP shall still ensure that all IRI and CC in the communication session has the same CIN.

6 Intercept Related Information (IRI) and Content of Communication (CC)

6.1 Definition of IRI events and CC events

IRI events are defined as per ETSI TS 101 671 [1]. CC is sent on all occasions that CC would be sent under ETSI TS 101 671 [1]. Further details for ISDN are provided by the state model and message sequence diagrams in ETSI TR 102 053 [i.1]; in particular see clause 6 of ETSI TR 102 053 [i.1].

6.2 CC format

The PstnIsdnCC structure shall contain the application layer traffic. Currently supported application layer protocols are RTP and UDPTL [11]. The CC shall also contain the application layer header, UDP header and IP header, except by agreement between CSP and LEA.

NOTE: CSPs and LEAs may choose to omit headers because they are unavailable at the point of interception.

The SupplementaryInfo FrameType field indicates which headers are present in a given CC stream. If all headers are present, the FrameType field may be omitted.

In the case where the RTP header is unavailable, one may be inserted by the mediation function, subject to agreement between LEA and CSP. The addition of an inserted RTP header may aid processing the audio stream at the receiver. When an artificial header is used, this shall be signalled using the artificialRtpFrame parameter of the FrameType structure.

The content (RTP or UDPTL payload) shall be a complete, unmodified copy of CC information that is part of the target communication. If a UDPTL payload is transmitted, the mediaFormat parameter as defined in clause 6.3.2 shall be set to "0". In this case, the value is insignificant for the LEA.

The RTP header shall accurately describe the target communication.

The information contained in the IP and UDP header does not necessarily relate to any media flow as seen by the target.

IP and UDP headers shall not be inserted to the intercepted material by the mediation function if they are unavailable.

If encryption has been applied within the CSP's domain and under their control, either it shall be removed or full details of the encryption including keys shall be supplied.

Typically under PSTN/ISDN the RTP codec used is Recommendation ITU-T G.711 [6]. The codec in use shall be signalled as described in clause 6.3.

6.3 Supplementary information

6.3.1 Requirements for supplementary information

It is required that the LEA has enough information to decode and comprehend the traffic delivered over the Handover Interface. The following information is required:

- Description of the format of the CC, to allow the LEMF to understand the information within the CC.

6.3.2   Supplementary information

Supplementary information is defined to be the following set of information.

Field name	Status	ASN.1 field	Information
Media format	Mandatory	mediaFormat	This field signals the codec used, as defined in IETF RFC 3551 [10]. The supplementary info shall contain only one media format (send another supplementary information messages if the format changes). See clause 6.2 for additional requirements on the use of this field.
Media attributes	Conditional (i.e. mandatory under the conditions listed)	mediaAttributes	If any extra information (beyond the Media Format) is needed to understand the delivered CC then it shall be sent here, in the format defined in the 'a=' field of SDP (see IETF RFC 4566 [7]). Typically, media attributes shall be present if and only if the media format is 32 or above.
Encryption key	Conditional	encryptionKey	See clause 6.2.
Session name	Optional	sessionName	If present in the target communication (e.g. SDP 's=' field), it may be present in supplementary information as decided by national agreement.
Session information	Optional	sessionInfo	If present in the target communication (e.g. SDP 'i=' field), it may be present in the target communication, it may be present as decided by national agreement.
Copy of SDP message	Optional	copyOfSDPMessage	In addition to the above information, an SDP message may be included here.
Frame type	Optional	frameType	If one or more headers are missing from the intercepted content, this structure has to be used to signal what is being delivered.
Alternate Protocol	Optional	alternateProtocol	If a complete IP, UDP or application frame is available and the payload is not RTP, this field has to be used to signal the type of application layer traffic.

6.3.3   Sending supplementary information

Supplementary information shall be sent as soon as possible for a communications session, and should be sent before CC is available.

If supplementary information is not available before the CC, under no circumstances shall CC be buffered or delayed. If supplementary information is critical to interpreting the CC, then CSPs shall ensure their systems are designed to avoid any delay in sending supplementary information.

If the communications session contains traffic in more than one direction, then one set of supplementary information shall be sent for each direction present. Under some circumstances, the traffic sent in one direction will have a different set of supplementary information from traffic sent in the other direction (e.g. traffic to the target uses a different codec compared to traffic going from the target). Under these circumstances, the direction flag shall always be present and correct for all CC PDUs, and only the values "To Target" and "From Target" shall be used.

If the supplementary information changes during a session (e.g. change of codec), then a new set of supplementary information shall be sent as soon as possible (it should be sent before the change occurs). It is required that the LEMF can identify the point in the CC stream at which the change took place. If it is not clear from the CC, then the CSP should populate the field "First PDU number" within the structure "InformationAppliesTo", to state the sequence number of the first CC-PDU to which the new supplementary information applies.

Supplementary information shall be sent as IRI and/or in CC-PDUs (in this case at least in the first PDU and in the following PDUs only if there are any changes during the session).

6.3.4   Identification of CCLinks

ETSI TS 101 671 [1] identifies certain occasions when different CCLinks are established (e.g. multi-party calls).

If there are a number of different CCLinks (see ETSI TS 101 671 [1]), then one set of supplementary information shall be sent for each CC Link and the CCLinkID represent the CCLink that this information applies to. Within each CC Link, traffic in different directions shall be isolated and identified as described in clause 6.3.3.

Note that the sequence numbering of CC-PDUs is not affected by the CCLink counter (i.e. do not maintain separate sequence number counts for separate CCLinks).

Annex A (normative): ASN.1 for IRI and CC

A.1 Note on integrating ASN.1 structures

IRI information structures are defined by the ASN.1 in ETSI TS 101 671 [1]. The headers that shall be applied to all IRI are defined in ETSI TS 102 232-1 [2]. There is some overlap between these structures, in that some fields which are present in ETSI TS 101 671 [1] IRI-Parameters are then repeated in the ETSI TS 102 232-1 [2] PSHeader construction. In particular, there are the following overlaps: Lawful Intercept Identifier, Communication Identifier, TimeStamp.

The present document follows ETSI TS 102 232-1 [2] for header information and requires that the ETSI TS 102 232-1 [2] header shall be populated. For ease of interoperability the present document recommends that repeated fields should be populated in both the ETSI TS 102 232-1 [2] and ETSI TS 101 671 [1] parts of the header.

A.2 ASN.1 definitions

The ASN.1 definitions are contained in a asn file (*PstnIsdnPDU,ver6.asn)* contained in archive ts_10223206v030501p0.zip which accompanies the present document.

ETSI TR 102 503 [i.2] gives an overview of the relevant Object Identifiers (OIDs) used in ASN.1 modules of the Lawful Intercept specifications and points to the specification where the modules can be found.

Annex B (informative):
Change request history

Status of the present document: ETSI TS 102 232-6 Service-specific details for PSTN/ISDN services; Handover specification for IP delivery		
TC LI approval Date	**Version**	**Remarks**
September 2006	2.1.1	First publication of the TS after approval by ETSI/TC LI#13 (6-8 September 2006, Stockholm)
April 2007	2.2.1	Included Change Request: TS102232-06CR001r1 (cat B) on Clarification of use of RTP/UDP/IP headers This CR was approved by TC LI#15 (23-25 April 2007; Riga)
May 2008	2.3.1	Included Change Requests: TS102232-06CR002r1 (cat C) on Some comment and modification on the identification CCLinks defined in the clause 6.3.4 This CR was approved by TC LI#16 (2-4 October 2007; Berlin) TS102232-06CR003r1 (cat B) on SupplementaryInfo in PstnIsdnCC This CR was approved by TC LI#18 (27-29 May 2008; Chania)
May 2012	3.1.1	Included Change Request: TS102232-06CR004r1 (cat B) on Addition of rtpframe parameter This CR was approved by TC LI#30 (14-16 May 2012, Amsterdam) The ASN.1 definitions are contained in a .txt file (PstnIsdnPDU,ver4.txt) which accompanies the present document
June 2013	3.2.1	Included Change Request: TS102232-06CR005r1 (cat C) on supplementary Information
February 2014	3.3.1	Included Change Request: TS102232-06CR006r2 (cat B) on addition of UDPTL This CR was approved as TD022r2 by TC LI#35 Milan
November 2022	3.4.1	Included Change Request: TS102232-06CR007r1 (cat F) Moving ASN.1 to attachment This CR was approved as TD015r1 by TC LI#61 Malmö
March 2023	3.5.1	Included Change Requests: TS102232-06CR008r2 (cat F) Clarify use of mediaFormat parameter on RTP to UDPTL transition TS102232-06CR009 (cat C) Simplify OID versioning. Fully qualify ASN.1 imports These CRs were approved by TC LI#62 Sophia Antipolis

History

Document history		
V2.1.1	December 2006	Publication (Historical)
V2.2.1	May 2007	Publication (Historical)
V2.3.1	August 2008	Publication (Historical)
V3.1.1	June 2012	Publication
V3.2.1	July 2013	Publication
V3.3.1	March 2014	Publication
V3.4.1	November 2022	Publication
V3.5.1	March 2023	Publication