ATIS-0700017

NORTH AMERICAN CHANGES TO THE ATIS TRANSPOSED SPECIFICATIONS ON 3GPP™ RELEASE 6 LAWFUL INTERCEPTION

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ATIS Standard on

North American Changes to the ATIS Transposed Specifications on 3GPP™ Release 6 Lawful Interception

Alliance for Telecommunications Industry Solutions

Approved February 12, 2016

Abstract

This standard describes the additions and modifications needed to the ATIS transposed Third Generation Partnership Project (3GPP™) Release 6 Lawful Interception specifications (i.e., 3GPP TS 33.106, 3GPP TS 33.107, and 3GPP TS 33.108) to meet the United States and Canadian requirements for Lawfully Authorized Electronic Surveillance (LAES).

Foreword

The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between carriers, customers, and manufacturers. The Wireless Technologies and Systems Committee (WTSC) develops and recommends standards and technical reports related to wireless and/or mobile services and systems, including service descriptions and wireless technologies. WTSC develops and recommends positions on related subjects under consideration in other North American, regional, and international standards bodies.

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

At the time it approved this document, WTSC, which is responsible for the development of this Standard, had the following leadership:

      Peter Musgrove (AT&T), Chairman, WTSC Lawful Intercept (LI)
      Greg Schumacher (Sprint), Vice-Chairman, WTSC LI
      Michael Bilca (Trideaworks, consultant to DoJ/OTD), Editor

The **WTSC LI** Subcommittee was responsible for the development of this document.

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ATIS Standard on –

North American Changes to the ATIS Transposed Specifications on 3GPP™ Release 6 Lawful Interception

1   Scope, Purpose, & Application

1.1   *Background*

Under the 3GPP[1] organizational partners' terms for a partnership project, ATIS and its Forums and Committees agree to cooperate in the production of specifications applicable for regional or global adoption. These specifications are approved by the appropriate Forum or Committee as ATIS Technical Specifications and no changes are permitted in the text of the 3GPP partnership's specification. If changes are necessary, in whole or in part, for the specific needs of North America, the ATIS Technical Specification will be the basis for development of a proposed American National Standard (ANS) or other ATIS document. In most cases, the appropriate Forum or Committee will adopt a "delta document" approach in which the ANS or other ATIS document is reduced to a selection of options from the ATIS Technical Specification. The ATIS Technical Specification is then cited as a normative reference [6].

This "delta document" approach has been taken in order to satisfy Lawfully Authorized Electronic Surveillance (LAES) requirements in the United States and Canada with regard to the ATIS transposed 3GPP Lawful Interception specifications (i.e., 3GPP TS 33.106, 3GPP TS 33.107, and 3GPP TS 33.108), which provides a Global System for Mobile Communications (GSM), General Packet Radio Service (GPRS), and Universal Mobile Telecommunications System (UMTS) lawful interception solutions that generally apply to multiple countries.

1.2   *Scope*

This Standard addresses additions and modifications to the ATIS transposed 3GPP Release 6 Lawful Intercept (LI) specifications (i.e., 3GPP TS 33.106, 3GPP TS 33.107, and 3GPP TS 33.108) that are needed to meet the United States and Canadian requirements for LAES. The latest 3GPP Release 6 LI specifications shall be used as the basis for this Standard. The following format is used within this document:

- Clause 2 identifies the references used within this standard.
- Clause 3 identifies the definitions, acronyms, & abbreviations used within this standard.
- Clause 4 identifies the changes to the lawful interception requirements specified in 3GPP TS 33.106 and each change is identified as:
  - 4.x Delta <y>: Title
    Where, 4.x is the sub-clause and Delta <y> identifies the change #y defined in this Standard and Title is the heading of the change.
- Clause 5 identifies the changes to the lawful interception architecture functions specified in 3GPP TS 33.107 and each change is identified as:
  - 5.x Delta <y>: Title

    Where, 5.x is the sub-clause and Delta <y> identifies the change #y defined in this Standard and Title is the heading of the change.

- Clause 6 identifies the changes to the handover interface for lawful interception specified in 3GPP TS 33.108 and each change is identified as:
  - 6.x Delta <y>: Title
    Where, 6.x is the sub-clause and Delta <y> identifies the change #y defined in this Standard and Title is the heading of the change.

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[1] "3GPP" is a registered trademark of ETSI in France and other jurisdictions on behalf of the 3rd Generation Partnership Project Organizational Partners (ARIB, ATIS, CCSA, ETSI, TTA, TTC).

- Annex A provides the ASN.1 definition of the object module to be used along with this standard. The standard identifies a total of 19 changes to the 3GPP LI specifications – 2 for 3GPP TS 33.106, 3 for 3GPP TS 33.107, and 14 for 3GPP TS 33.108.

1.3 Purpose

The purpose of this Standard is to provide the changes needed to the 3GPP Release 6 LI specifications to meet the United States Communications Assistance for Law Enforcement Act (CALEA) requirements and Canadian operators' LAES requirements.

1.4 Application

This Standard is applicable to lawful interception solutions in 3GPP™ systems (e.g., GSM, GPRS, or UMTS) within the United States or Canada. The changes identified in this standard shall be applicable in addition to the implementation of the Release 6 3GPP™ LI Specifications. This Standard is intended to apply to previous versions of 3GPP™ Release 6 LI Specifications.

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.

[1] ATIS.3GPP.33.106V610-2005, *Technical Specification Group Services and System Aspects; 3G security; Lawful Interception requirements.*[2]

[2] ATIS.3GPP.33.107V640-2005, *Technical Specification Group Services and System Aspects; 3G security; Lawful interception architecture and functions.*[2]

[3] ATIS.3GPP.33.108V682-2005, *Technical Specification Group Services and System Aspects; 3G security; Handover interface for Lawful Interception.*[2]

[4] ATIS-0700005.2007, *Lawfully Authorized Electronic Surveillance (LAES) for 3GPP IMS-based VoIP and other Multimedia Services.*[2]

[5] ATIS-0700005.a.2010, *Supplement A to Lawfully Authorized Electronic Surveillance (LAES) for 3GPP IMS-based VoIP and other Multimedia Services.*[2]

[6] ATIS Operating Procedures, March 2015.[2]

3 3 Definitions, Acronyms, & Abbreviations

3.1 Definitions

No new concepts are introduced in this document. Look to the upstream 3GPP documents for clarifications.

3.2 Acronyms & Abbreviations

3GPP	Third Generation Partnership Project
ANS	American National Standard
ATIS	Alliance for Telecommunications Industry Solutions

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[2] This document is available from the Alliance for Telecommunications Industry Solutions (ATIS) < https://www.atis.org/docstore/default.aspx >.

CALEA	Communications Assistance for Law Enforcement Act
CC	Communication Content
CSCF	Call Session Control Function
DDE	Dialed Digit Extraction
DDR	Dialed Digit Reporting
DF	Delivery Function
FTP	File Transfer Protocol
GGSN	Gateway GPRS Support Node
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
GSN	GPRS Support Node
HLR	Home Location Register
HSS	Home Subscriber Server
IA	Interception Area
IAP	Intercept Access Point
IE	Information Element
IMEI	International Mobile Station Equipment Identity
IMS	Internet Protocol Multimedia Subsystem
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
IRI	Intercept Related Information
LDI	Location-Dependent Interception
LEA	Law Enforcement Agency
LEMF	Law Enforcement Monitoring Facility
MF	Medium Frequency
MMS	Multimedia Messaging Service
MSISDN	Mobile Station International Subscriber Directory Number
PDP	Packet Data Protocol
QoS	Quality of Service
RA	Remote Access
ROSE	Remote Operations Service Element
SGSN	Serving GPRS Support Node
SIP	Session Initiation Protocol
SMS	Short Message Service
TCP	Transmission Control Protocol
TPKT	ISO Transport Services on top of the TCP
TSP	Tunnel Setup Protocol
UDP	User Datagram Protocol
ULIC	UMTS LI Correlation Header
UMTS	Universal Mobile Telecommunications System
URL	Uniform Resource Locator

4   Deltas to Lawful Interception Requirements (3GPP TS 33.106)

This section describes the changes that apply to ATIS.3GPP.33.106V610-2005 [1].

4.1 Delta <1>: General Principles – Separation of Services

[Clause 5.1.2 Modification Start]

5.1.2 General principles

3GMS shall provide access to the intercepted Content of Communications (CC) and the Intercept Related Information (IRI) of the mobile target on behalf of Law Enforcement Agencies (LEAs).

Each service shall be delivered separately. For this specification, the distinction of services is based on regulatory definitions.

For services provided by the 3GMS, the interception for each service shall be able to be delivered separately. For this specification, the distinction of services is based on regulatory definitions. The following are examples of separately delivered services:

- VoIP from broadband data
- IMS VoIP from other IMS services
- IMS messaging (SMS & MMS) from other IMS services

A mobile target in a given 3GMS can be a subscriber of that 3GMS, or a user roaming from another 3GMS or from any other network capable of using that 3GMS (such as a GSM or mobile satellite). The intercepted CC and the IRI can only be delivered for activities on that given 3GMS.

For interception, there needs to be a means of identifying the target, correspondent and initiator of the communication. Target Identities used for interception of CS and GPRS service shall be MSISDN, IMEI and IMSI. Target Identities for multi-media shall be SIP URL. Other target identities for multi-media are for further study. When network encryption is introduced, it shall be a national option as to whether the network provides the CC to the agency decrypted, or encrypted with a key available to the agency. User provided end to end, encryption, encoding or compression cannot be removed by the network.

Location Dependent Interception (LDI) allows a 3GMS to service multiple interception jurisdictions within its service area. Multiple law agencies with their own interception areas can be served by the 3GMS. All the information or rules given for interception within a 3GMS apply to interception within an Interception Area (IA) when LDI is invoked. A target may be marked in one or more different IAs within the same 3GMS. Interception is not required nor prohibited by this standard when LDI is active and the location of the target subscriber is not known or available.

[Clause 5.1.2 Modification End]

4.2 Delta <2>: Delivery Requirements for Messaging

[Clause 5.13 Modification Start. Note: This leaves a gap after section 5.6 intentionally, to align with the later version where 5.13 is introduced in 3GPP TS 33.106]

5.13 Delivery Requirements for Messaging

The 3GPP network shall be able to support the separate delivery of intercept information (IRI or IRI/CC) for messaging services to the LEMF from other targeted services. This requirement is applicable for the following messaging services:

- SMS (3GPP TS 23.040 [21]); and

- MMS ([22]).

Message service delivery is independent from network access technology.

[Clause 5.13 Modification End]

[Clause 2 Modification Start – add references used in clause 5.13 above. Again, reference numbers are maintained for alignment, although they cause a gap to appear after reference number 10]

[21]   3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[22]   OMA OMA-AD-MMS-V1_3-20110913-A:"Multimedia Messaging Service Architecture".

[Clause 2 Modification end]

5 Deltas to Lawful Interception Architecture and Functions (3GPP TS 33.107)

This section describes the changes that apply to ATIS.3GPP.33.107V640-2005 [2].

5.1 Delta <3>: UMTS IRI Packet Data Header Information Reporting

The following clauses: 2 and 7.3 have been modified to provide UMTS IRI Packet Data Header Information reporting to support U.S. national requirements. In addtion, a new clause, 7.4.x, has been added. The deltas are shown below:

 [Clause 2 Modification Start. Note: Reference numbers are maintained for alignment with later versions of the specification, although they cause a gap to appear here]

[39]   IETF RFC 791: "Internet Protocol".

[40]   IETF RFC 2460: "Internet Protocol, Version 6 (IPv6) Specification".

[41]   IEFT RFC 3697: "IPv6 Flow Label Specification".

[Clause 2 Modification End]

[Clause 7.3 Modification Start]

7.3 Provision of Intercept Related Information

Intercept Related Information (Events) are necessary at the Mobile Station Attach, Mobile Station Detach, PDP Context Activation, Start of intercept with PDP context active, PDP Context Deactivation, RA update, Serving System, Packet Data Header Information reporting, and SMS events.

Serving System event reporting is a national option.

For systems deployed in the U.S., Packet Header Information Reporting records shall be delivered to Law Enforcement for IRI only authorizations.

Figure 21 shows the transfer of intercept related information to the DF2. If an event for / from a mobile subscriber occurs, the 3G GSN or the Home Location Register (HLR) sends the relevant data to the DF2. For Packet Data Header Information reporting, a 3G GSN either isolates the relevant data and sends it to the DF2 or sends the packet stream to another entity in the network (e.g., DF3) for isolation which then provides the relevant data to the DF2.

See Clause 7A for multi-media Intercept Related Information (IRI) produced at the CSCF.
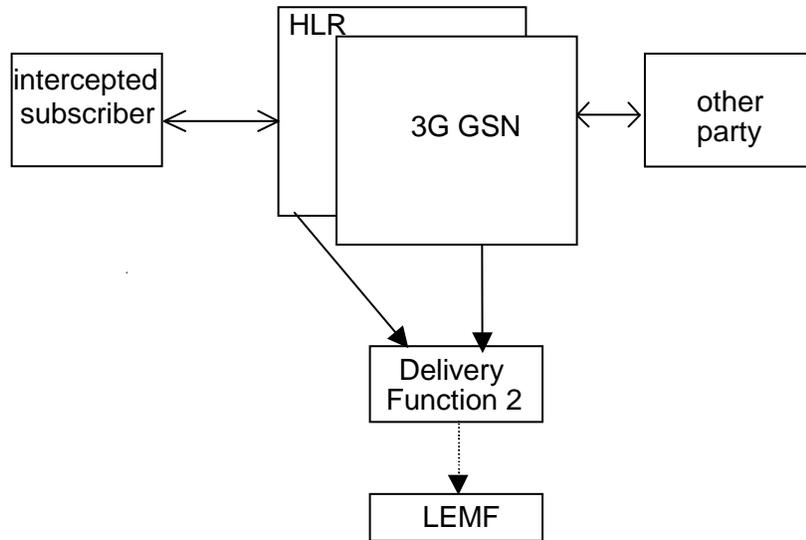
Figure 21: Provision of Intercept Related Information

7.3.1 X2-interface

The following information needs to be transferred from the 3G GSN or the HLR to the DF2 in order to allow a DF2 to perform its functionality:

- target identity (MSISDN, IMSI, IMEI);
- events and associated parameters as defined in clauses 7.3.2 and 7.4 may be provided;
- the target location (if available) or the IAs in case of LDI;
- Correlation number;
- Quality of Service (QoS) identifier;
- Encryption parameters (keys and associated parameters for decrypting CC), if available and necessary.

The IRI should be sent to DF2 using a reliable transport mechanism.

The 3G GSN detects packets containing Packet Data Header Information in the communications path, but the information needed for Packet Data Header Information reporting may need to be transferred from the 3G GSN either directly to the DF2 or via another entity in order to allow the DF2 to perform its functionality.

7.3.2 Structure of the events

There are several different events in which the information is sent to the DF2 if this is required. Details are described in the following clause. The events for interception are configurable (if they are sent to DF2) in the 3G GSN or the HLR and can be suppressed in the DF2.

The following events are applicable to 3G SGSN:

- Mobile Station Attach;
- Mobile Station Detach;
- PDP context activation;
- Start of interception with mobile station attached (national option);
- Start of intercept with PDP context active;
- PDP context modification;
- PDP context deactivation;
- RA update;
- SMS;
- Packet Data Header Information reporting.

NOTE: 3G GGSN interception is a national option. Location information may not be available in this case. If interception is performed at the 3G GGSN, then Packet Data Header Information reporting shall also be performed at the 3G GGSN and not at the 3G SGSN.

The following events are applicable to the 3G GGSN:

- PDP context activation;
- PDP context modification;
- PDP context deactivation;
- Start of interception with PDP context active;
- Packet Data Header Information reporting.

The following events are applicable to the HLR:

- Serving System.

A set of elements as shown below can be associated with the events. The events trigger the transmission of the information from 3G GSN or HLR to DF2, perhaps via a MF in the case of Packet Data Header Information reporting. Available IEs from this set of elements as shown below can be extended in the 3G GSN or HLR, if this is necessary as a national option. DF2 can extend available information if this is necessary as a national option e.g. a unique number for each surveillance warrant.

Table 2: Information Events for Packet Data Event Records

Observed MSISDN MSISDN of the target subscriber (monitored subscriber).
Observed IMSI IMSI of the target subscriber (monitored subscriber).
Observed IMEI IMEI of the target subscriber (monitored subscriber),it shall be checked for each activation over the radio interface.
Event type Description which type of event is delivered: MS attach, MS detach, PDP context activation, Start of intercept with PDP context active, PDP context deactivation, SMS, Serving System, Packet Data Header Information, Cell and/or RA update.
Event date Date of the event generation in the 3G GSN or the HLR.
Event time Time of the event generation in the 3G GSN or the HLR. Timestamp shall be generated relative to GSN or HLR internal clock.
PDP address The PDP address of the target subscriber. Note that this address might be dynamic.
Access Point Name The APN of the access point. (Typically the GGSN of the other party).
Location Information Location Information is the Service Area Identity (SAI), RAI and/or location area identity that is present at the GSN at the time of event record production.
Old Location Information Location Information of the subscriber before Routing Area Update
PDP Type The used PDP type.
Correlation Number The correlation number is used to correlate CC and IRI.
SMS The SMS content with header which is sent with the SMS-service. The header also includes the SMS-Centre address.
Network Element Identifier Unique identifier for the element reporting the ICE.
Failed attach reason Reason for failed attach of the target subscriber.
Failed context activation reason Reason for failed context activation of the target subscriber.
IAs The observed Interception Areas.
Initiator The initiator of the PDP context activation, deactivation or modification request either the network or the 3G MS.
SMS Initiator SMS indicator whether the SMS is MO or MT.
Deactivation / termination cause The termination cause of the PDP context.
QoS This field indicates the Quality of Service associated with the PDP Context procedure.
Serving System Address Information about the serving system (e.g. serving SGSN number or serving SGSN address).
Destination IP Address The IP address, including type IPv4 or IPv6, of the destination of the IP packet.
Destination Port Number The port number of the destination of the IP packet.
Flow Label (IPv6 only) The field in the IPv6 header that is used by a source to label packets of a flow (see RFC 3697 [41]).
Packet Count The number of packets detected and reported (for a particular summary period).
Packet Data Summary Reason The reason for a Packet Data Summary message being sent to the LEMF (e.g., timed out, counter expiration, end of session).
Packet Size The size of the packet (i.e., Total Length Field in IPv4 or Payload Length field in IPv6).

Source IP Address The IP address, including type IPv4 or IPv6, of the source of the IP packet.
Source Port Number The port number of the source of the IP packet.
Sum of Packet Sizes (for a particular summary period) The sum of values contained in the Total Length fields of the IPv4 packets or the sum of the values contained in the Payload Length fields of the IPv6 packets.
Summary Period Includes the dates and times of the first and last packets in a particular packet data interval.
Transport Protocol (e.g., TCP) The identification of the transport protocol of the packet or packet flow being reported.

[Clause 7.3 Modification End]

[New Clause 7.4.11 Insertion Start. This leaves a gap after the current 7.4.9 for alignment.]

7.4.11 Packet Data Header Information Reporting

7.4.11.0 Introduction

Packet Data Header Information reporting can be done either on a per-packet (i.e., non-summarized) basis or in a summary report.

7.4.11.1   Packet Data Header Report

This event is used to provide packet header reports on a per packet basis (non-summarized reporting) and is triggered by each packet sent or received by the target. These elements will be delivered either directly to DF2 or via another network entity if available:

Observed MSISDN
Observed IMSI
Observed IMEI
PDP address of observed party
Event Type
Event Time
Event Date
Correlation Number
Access Point Name
PDP Type
Network Element Identifier
Source IP Address
Source Port Number
Destination IP Address
Destination Port Number
Transport Protocol (e.g., TCP)
Packet Size
Flow Label (IPv6 only)

7.4.11.2   Packet Data Summary Report

This event is used to report:
1) The source and destination information derived from the packet headers, including:
   a) Source and destination IP Addresses,
   b) IP next-layer protocol,
   c) Layer-4 ports, and
   d) Flow label, if the packet is IPv6.
2) Summary information for the number of packets and bytes transmitted or received by the subject for each unique packet flow within a PDP context, and

3) The date and the time of the first and last packets associated with that packet flow. A packet flow is defined as the 6-tuple of source/destination IP address/port number and the layer 4 protocol and PDP Context.
IP addresses and the IP next-layer protocol are always reported, the flow label is reported if the packet is IPv6, and the layer-4 ports are reported.

The event provides packet summary reports for each unique packet data session (PDP context) and packet flow, and is triggered by one of the following:

- Start of a packet flow associated with a PDP Context.
- An interim report for a packet flow associated with a PDP Context is to be reported.
- End of a packet flow associated with a PDP Context (including end of the PDP Context itself).

An interim report can be triggered by:

- The expiration of a configurable timer per intercept (called a Summary Timer). The Summary Timer is configurable in units of seconds.
- A per-intercept configurable count threshold being reached.

These elements will be delivered either directly to DF2 or via an MF for each packet flow if available:

Observed MSISDN
Observed IMSI
Observed IMEI
PDP address of observed party
Event Type
Event Time
Event Date
Correlation Number
Access Point Name
PDP Type
Network Element Identifier
Source IP Address
Source Port Number
Destination IP Address
Destination Port Number
Transport Protocol (e.g., TCP)
Flow Label (IPv6 only)
Summary Period
Packet Count (for this summary period)
Sum of Packet Sizes (for this summary period)

If the packets are IPv4, the sum of all observed packet sizes is the sum of the values contained in the Total Length field of each packet as specified in IETF RFC 791[18].

If the packet is IPv6, the sum of all observed packet sizes is the sum of the values contained in the Payload Length field for each packet as specified in IETF RFC 2460 [19].

If no packets were detected for the duration of the Summary Timer, then the Packet Data Summary Report shall not be sent.

[New Clause 7.4.11 Insertion End]

5.2 Delta <4>: UMTS Start of interception for already attached UE Reporting

3GPP TS 33.107 release 6 does not address the cases when interception starts for an already attached UE with no PDP context.   When LI is activated after UE has attached, a new event "Start of interception" shall be sent.

The clauses: 7.3.2 and 7.4 have been modified to provide UMTS Start of interception for already attached UE message to support US national requirements.

[Clause 7.3.2 Modification Start]

7.3.2 Structure of the events

There are several different events in which the information is sent to the DF2 if this is required. Details are described in the following clause. The events for interception are configurable (if they are sent to DF2) in the 3G GSN or the HLR and can be suppressed in the DF2.

The following events are applicable to 3G SGSN:

- Mobile Station Attach;
- Mobile Station Detach;
- PDP context activation;
- Start of interception with mobile station attached (national option);
- Start of intercept with PDP context active;
- PDP context modification;
- PDP context deactivation;
- RA update;
- SMS.
NOTE: 3G GGSN interception is a national option. Location information may not be available in this case.

The following events are applicable to the 3G GGSN:

- PDP context activation;
- PDP context modification;
- PDP context deactivation;
- Start of interception with PDP context active.

The following events are applicable to the HLR:

- Serving System.

A set of fields as shown below can be associated with the events. The events trigger the transmission of the information from 3G GSN or HLR to DF2. Available IEs from this set of fields as shown below can be extended in the 3G GSN or HLR, if this is necessary as a national option. DF2 can extend available information if this is necessary as a national option e.g. a unique number for each surveillance warrant.

[Clause 7.3.2 Modification End]

[Clause 7.4.10 Insertion Start]

7.4.10 Start of interception with mobile station attached

This event will be generated if interception has started for the already attached target. These elements will be delivered to the DF2 if available:

Observed MSISDN
Observed IMSI
Observed IMEI
Event Type

Event Time
Event Date
Network Element Identifier
Location Information
IAs (if applicable)

[Clause 7.4.10 Insertion End]

5.3 Delta <5>: Source and Destination Address of SMS Messages

[Clause 6.3.4.1 Modification Start]

6.3.4.1 SMS

For MO-SMS the event is generated in the 3G MSC Server. Dependent on national requirements, event generation shall occur either when the 3G MSC Server receives the SMS from the target MS or when the 3G MSC Server receives notification that the SMSC successfully receives the SMS; for MT-SMS the event is generated in the 3G MSC Server. Dependent on national requirements, event generation shall occur either when the 3G MSC Server receives the SMS from the SMSC or when the 3G MSC Server receives notification that the target MS successfully received the message. This information will be delivered to the DF2 if available:

Observed MSISDN
Observed IMSI
event type
event date
event time
Network Element Identifier
Location Information
SMS initiator
SMS Message
SMS Origin
SMS Destination

[Clause 6.3.4.1 Modification End]

[Clause 7.4.7 Modification Start]

7.4.7 SMS

For MO-SMS the event is generated in the 3G SGSN. Dependent on national requirements, event generation shall occur either when the 3G SGSN receives the SMS from the target MS or when the 3G SGSN receives notification that the SMS-Centre successfully receives the SMS; for MT-SMS the event is generated in the 3G SGSN. Dependent on national requirements, event generation shall occur either when the 3G SGSN receives the SMS from the SMS-Centre or when the 3G SGSN receives notification that the target MS successfully received the message. These fields will be delivered to the DF2 if available:

Observed MSISDN
Observed IMSI
Observed IMEI
Event Type
Event Time
Event Date
Network Element Identifier
Location Information
SMS
SMS Initiator
SMS Origin
SMS Destination
IAs (if applicable)

[Clause 7.4.7 Modification End]

6 Deltas to Handover Interface for Lawful Interception (3GPP TS 33.108)

This Clause describes the changes that apply to ATIS.3GPP.33.108V682-2005 [3].

Within the 3GPP™ Release 6 LI specifications and this document, the term "GSM system(s)" is often used in the generic sense to describe the third-generation (3G) mobile telecommunications technologies, which includes "GPRS/ EDGE[3]" access technologies. This is due to the fact that UMTS and GSM radio access networks can share the same Core Network (CN).   Unless otherwise specified, the term "GSM system(s)" includes GPRS/EDGE, and the surveillance solution shall also be applicable.

6.1 Delta <6>: Packet Data Header Report Restriction

[Annex H Modification Start]

Annex H (normative): United States lawful interception (PS domain and IMS)

With respect to the handover interfaces they must be capable of delivering intercepted communications and IRI information to the government in a format such that they may be transmitted by means of equipment, facilities, or services procured by the government to a location other than the premises of the carrier.

With respect to location information 'when authorized' means the ability to provide location information on a per-surveillance basis.

The delivery methods described in this document are optional methods and no specific method is required in the United States.

The specification of lawful intercept capabilities in this document does not imply that those services supported by these lawful intercept capabilities are covered by CALEA. Inclusion of a capability in this document does not imply that capability is required by CALEA. This document is intended to satisfy the requirements of section 107 (a) (2) of the Communications Assistance for Law Enforcement Act, Pub. L. 103-414 such that a telecommunications carrier, manufacturer, or support service provider that is in compliance with this document shall have "Safe Harbor".

In the United States surveillance on the GGSN is not required, but is an option that may be negotiated between the service provider and law enforcement.

In North America, for the Packet Data Header Report, only the packetHeaderDataMapped choice shall be used.

A TSP shall not be responsible for decrypting or decompressing, or ensuring the government's ability to decrypt or decompress, any communication encrypted or compressed by a subscriber or customer, unless the encryption or compression was provided by the TSP and the TSP possesses the information necessary to decrypt or decompress the communication. A TSP that provides the government with information about how to decrypt or decompress a communication (e.g. identifying the type of compression software used to compress the communication, directing the government to the appropriate vendor that can provide decryption or decompression equipment, or providing the encryption key used to encrypt the communication) fully satisfies its obligation under the preceding sentence.

Reporting of Dialed Digits present in the content stream shall be performed on a per lawful authorization basis. Dialed Digit Reporting (DDR) requirements can be achieved with this standard by directing the intercept subject's media stream to the LEMF where the LEMF can isolate the Dialed Digits. Other methods for reporting of intercept subject Dialed Digits are for further study.

NOTE: Dialed Digits are keypad digits 0, 1, 2, 3, 4, 5, 6, 7. 8, 9, *, and # entered by the intercept subject.

[Annex H Modification End]

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[3] Enhanced Data rates for GSM Evolution (EDGE) (also known as Enhanced GPRS (EGPRS)

6.2 Delta <7>: Source and Destination Address of SMS Messages

[Table 6.7 Modification Start]

Table 6.7: SMS-MO and SMS-MT Communication REPORT Record

Parameter	MOC	Description/Conditions
observed MSISDN	C	Provide at least one and others when available.
observed IMSI		
observed IMEI		
event type	C	Provide SMS event type.
event date	M	Provide the date and time the event is detected.
event time		
network identifier	M	Shall be provided.
lawful intercept identifier	M	Shall be provided.
SMS originating address	~~O~~C	Provide ~~to identify the originating and destination address of the SMS message~~ if available. The originating address is that of the mobile terminal or other entity that created the SMS. The destination address is that of the mobile terminal or other entities that the SMS is intended for.
SMS destination address		
location information	C	Provide, when authorized, to identify location information for the intercept subject's MS.
SMS	C	Provide, when authorized, to deliver SMS content, including header which is sent with the SMS-service.
service center address	C	Provide to identify the address of the relevant SMS-C server. If SMS content is provided, this parameter is optional.
SMS initiator	M	Indicates whether the SMS is MO, MT, or Undefined.

[Table 6.7 Modification End]

6.3 Delta <8>: Security, Transparency, Integrity and Completeness Requirements

[Section 6.3 insertion - start]

6.3.0 Introduction

Security is defined by national requirements.

6.3.1 Security

The intercept shall be protected from disclosure (e.g., using encryption) along the chain of network elements from isolation to delivery.

6.3.2 Transparency

Unauthorized parties (e.g., non-LI authorized Service Provider administrators) shall not have access or knowledge of intercepts. The intercept shall be protected from disclosure to the subject and associates, or any other user of the network.

6.3.3 Integrity

The network shall use a mechanism (e.g., hashing) to preserve the integrity of the intercept.

6.3.4 Completeness

The network shall protect against LI information losses (e.g., dropped packets) in the delivery of the intercept (e.g., by employing a buffering mechanism).

[Section 6.3 insertion - end]

6.4 Delta <9>: Content of communication interception for packet domain at GGSN

[Annex H Modification Start]

In the United States, for a broadband access intercept pertaining to:

1) 3GPP GPRS/UMTS access,

a) The SGSN and the HSS shall perform interception. GGSN may optionally support interception; however, it must support interception in the cases outlined below.

b) The GGSN shall support interception in the following cases:.

-    If direct tunnel functionality as defined in TS 23.060 [42] is used in the network,

-    If the network supports roaming and the communications comes into the GGSN from a SGSN (in the visited network) over a Gp interface.

c) For any other scenario where the traffic does not pass the SGSN, the GGSN shall support interception.

[Annex H Modification End]

[Section 2 Modification Start – add reference 42 used in Clause 6.17 above. Again, reference numbers are maintained for alignment, although this causes a gap to appear]

[42]   3GPP TS 23.060: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; General Packet Radio Service (GPRS); Service description".

[Section 2 Modification End]

6.5 Delta <10>: Network Element Identifier Correction

[Annex H Modification Start]

A TSP shall not be responsible for decrypting or decompressing, or ensuring the government's ability to decrypt or decompress, any communication encrypted or compressed by a subscriber or customer, unless the encryption or compression was provided by the TSP and the TSP possesses the information necessary to decrypt or decompress the communication. A TSP that provides the government with information about how to decrypt or decompress a communication (e.g. identifying the type of compression software used to compress the communication, directing the government to the appropriate vendor that can provide decryption or decompression equipment, or providing the encryption key used to encrypt the communication) fully satisfies its obligation under the preceding sentence.

For systems deployed in the U.S., the network element identifier is required.

Reporting of DialedDialed Digits present in the content stream shall be performed on a per lawful authorization basis. DialedDialed Digit Reporting (DDR) requirements can be achieved with this standard by directing the intercept subject's media stream to the LEMF where the LEMF can isolate the DialedDialed Digits. Other methods for reporting of intercept subject DialedDialed Digits are for further study.

[Annex H Modification End]

6.6 Delta <11>: Reporting of Serving System Change Correction

To indicate this is a mandatory U.S. requirement, the text in Annex H has been modified to show that when a mobile terminal is authorized for service with another network operator or service provider, a Serving System REPORT record shall be triggered.

 [Annex H Modification Start]

Annex H (Normative): United States lawful interception (PS domain and IMS)

With respect to the handover interfaces they must be capable of delivering intercepted communications and IRI information to the government in a format such that they may be transmitted by means of equipment, facilities, or services procured by the government to a location other than the premises of the carrier.

With respect to location information 'when authorized' means the ability to provide location information on a per-surveillance basis.

The delivery methods described in this document are optional methods and no specific method is required in the United States.

The specification of lawful intercept capabilities in this document does not imply that those services supported by these lawful intercept capabilities are covered by CALEA. Inclusion of a capability in this document does not imply that capability is required by CALEA. This document is intended to satisfy the requirements of section 107 (a) (2) of the Communications Assistance for Law Enforcement Act, Pub. L. 103-414 such that a telecommunications carrier, manufacturer, or support service provider that is in compliance with this document shall have "Safe Harbor".

In the United States surveillance on the GGSN is not required, but is an option that may be negotiated between the service provider and law enforcement.

A TSP shall not be responsible for decrypting or decompressing, or ensuring the government's ability to decrypt or decompress, any communication encrypted or compressed by a subscriber or customer, unless the encryption or compression was provided by the TSP and the TSP possesses the information necessary to decrypt or decompress the communication. A TSP that provides the government with information about how to decrypt or decompress a communication (e.g. identifying the type of compression software used to compress the communication, directing the government to the appropriate vendor that can provide decryption or decompression equipment, or providing the encryption key used to encrypt the communication) fully satisfies its obligation under the preceding sentence.

Reporting of DialedDialed Digits present in the content stream shall be performed on a per lawful authorization basis. DialedDialed Digit Reporting (DDR) requirements can be achieved with this standard by directing the intercept subject's media stream to the LEMF where the LEMF can isolate the DialedDialed Digits. Other methods for reporting of intercept subject DialedDialed Digits are for further study.

NOTE: DialedDialed Digits are keypad digits 0, 1, 2, 3, 4, 5, 6, 7. 8, 9, *, and # entered by the intercept subject.

When a mobile terminal is authorized for service with another network operator or service provider, or within another service area as defined in J-STD-025-B [65], a Serving System REPORT record shall be triggered.

[Annex H Modification End]

6.7 Delta <12>: Timing Requirements Missing

To indicate this is a mandatory U.S. requirement, the text in Annex H has been modified to identify the U.S. Timing Requirements.

[Annex H Modification Start]

Annex H (normative): United States lawful interception (PS domain and IMS)

With respect to the handover interfaces they must be capable of delivering intercepted communications and IRI information to the government in a format such that they may be transmitted by means of equipment, facilities, or services procured by the government to a location other than the premises of the carrier.

With respect to location information 'when authorized' means the ability to provide location information on a per-surveillance basis.

The delivery methods described in this document are optional methods and no specific method is required in the United States.

The specification of lawful intercept capabilities in this document does not imply that those services supported by these lawful intercept capabilities are covered by CALEA. Inclusion of a capability in this document does not imply

that capability is required by CALEA. This document is intended to satisfy the requirements of section 107 (a) (2) of the Communications Assistance for Law Enforcement Act, Pub. L. 103-414 such that a telecommunications carrier, manufacturer, or support service provider that is in compliance with this document shall have "Safe Harbor".

In the United States surveillance on the GGSN is not required, but is an option that may be negotiated between the service provider and law enforcement.

A TSP shall not be responsible for decrypting or decompressing, or ensuring the government's ability to decrypt or decompress, any communication encrypted or compressed by a subscriber or customer, unless the encryption or compression was provided by the TSP and the TSP possesses the information necessary to decrypt or decompress the communication. A TSP that provides the government with information about how to decrypt or decompress a communication (e.g. identifying the type of compression software used to compress the communication, directing the government to the appropriate vendor that can provide decryption or decompression equipment, or providing the encryption key used to encrypt the communication) fully satisfies its obligation under the preceding sentence.

Reporting of DialedDialed Digits present in the content stream shall be performed on a per lawful authorization basis. DialedDialed Digit Reporting (DDR) requirements can be achieved with this standard by directing the intercept subject's media stream to the LEMF where the LEMF can isolate the DialedDialed Digits. Other methods for reporting of intercept subject DialedDialed Digits are for further study.

> NOTE: DialedDialed Digits are keypad digits 0, 1, 2, 3, 4, 5, 6, 7. 8, 9, *, and # entered by the intercept subject.

An IRI record shall be sent from the TSP's IAP to the LEMF within eight seconds of the detection of the associated event by the IAP at least 95% of the time and with the event time stamped to an accuracy of at least 200 milliseconds, and is reported to at least the thousandth of a second. The same requirements shall apply to timestamps within content (HI-3 interface).

The time-stamp shall be coded as:

- Coordinated universal time; or
- Local time with the local time differential from coordinated universal time.

When a TSP delivers content of communication using UMTS LI Correlation (ULIC) header, ULIC version 1, including the time stamp attribute, shall be used.

[Annex H Modification End]

6.8 Delta <13>: Dialed Digit Extraction Clarification

Clarifications to the Dialed Digit Extraction (DDE) requirement have been added to the text in Annex H.

This modification is applicable to ATIS.3GPP.33.108V682-2005 and to subsequent versions of 3GPP Release 6 (i.e., 3GPP TS 33.108V6.10.0).

[2 References Modification Start]

> [55bis] ATIS-0700005.a.2010 *"Supplement A to ATIS-0700005, Lawfully Authorized Electronic Surveillance (LAES) for 3GPP IMS-based VoIP and other Multimedia Services"*

[2 References Modification End]

[Annex H Modification Start]

Annex H (normative):
United States lawful interception (PS domain and IMS)

Reporting of Dialed Digits present in the content stream shall be performed on a per lawful authorization basis. Dialed Digit Reporting (DDR) requirements can be achieved with this standard by directing the intercept subject's

~~media stream to the LEMF where the LEMF can isolate the Dialed Digits. Other methods for reporting of intercept subject Dialed Digits are for further study.~~

For IMS-based VoIP DDR message definition, see ATIS-0700005.2007 [55] and ATIS-0700005.a.2010 (supplement) [55bis].

> NOTE: The term Dialed Digit Extraction (DDE) used in [55] and [55bis] is the same as Dialed Digit Reporting (DDR).

> NOTE: Dialed Digits are keypad digits 0, 1, 2, 3, 4, 5, 6, 7. 8, 9, *, and # entered by the intercept subject.

> NOTE: DDR does not apply to PS domain and IMS-based multi-media services other than voice.

[Annex H Modification End]

6.9 Delta <14>: IMS-based VoIP and other multimedia services

Clarifications to the Multi-Media domain are shown below. This modification is applicable to ATIS.3GPP.33.108V682-2005 and to subsequent versions of 3GPP Release 6 (i.e., 3GPP TS 33.108V6.10.0).

[Annex C Modification Start]

Annex C (normative): UMTS HI3 interface

For the United States, use ATIS-0700005.2007 and ATIS-0700005.a.2010 (supplement) for the reporting of IRI and CC interception for IMS VoIP and other Multimedia Services.

There are two possible methods for delivery of content of communication to the LEMF standardized in this document:

-       UMTS LI Correlation Header (ULIC) and UDP/TCP. TCP is the protocol preferred by law enforcement for IRI and CC delivery. If TCP is available, its use is assumed unless a different protocol is agreed to by the LEA and the service provider.

-       FTP

[Annex C Modification End]

[Annex H Modification Start]

Annex H (normative): United States lawful interception (PS domain and IMS)

For the United States, use ATIS-0700005.2007 and ATIS-0700005.a.2010 (supplement) for the reporting of IRI and CC interception for IMS VoIP and other Multimedia Services.

With respect to the handover interfaces they must be capable of delivering intercepted communications and IRI information to the government in a format such that they may be transmitted by means of equipment, facilities, or services procured by the government to a location other than the premises of the carrier.

With respect to location information 'when authorized' means the ability to provide location information on a per-surveillance basis.

The delivery methods described in this document are optional methods and no specific method is required in the United States.

[Annex H Modification End]

6.10 Delta <15>: IMS Conferencing

[Annex H Modification Start]

Annex H (normative): United States lawful interception (PS domain and IMS)

With respect to the handover interfaces they must be capable of delivering intercepted communications and IRI information to the government in a format such that they may be transmitted by means of equipment, facilities, or services procured by the government to a location other than the premises of the carrier.

With respect to location information 'when authorized' means the ability to provide location information on a per-surveillance basis.

The delivery methods described in this document are optional methods and no specific method is required in the United States.

The specification of lawful intercept capabilities in this document does not imply that those services supported by these lawful intercept capabilities are covered by CALEA. Inclusion of a capability in this document does not imply that capability is required by CALEA. This document is intended to satisfy the requirements of section 107 (a) (2) of the Communications Assistance for Law Enforcement Act, Pub. L. 103-414 such that a telecommunications carrier, manufacturer, or support service provider that is in compliance with this document shall have "Safe Harbor".

In the United States surveillance on the GGSN is not required, but is an option that may be negotiated between the service provider and law enforcement.

A TSP shall not be responsible for decrypting or decompressing, or ensuring the government's ability to decrypt or decompress, any communication encrypted or compressed by a subscriber or customer, unless the encryption or compression was provided by the TSP and the TSP possesses the information necessary to decrypt or decompress the communication. A TSP that provides the government with information about how to decrypt or decompress a communication (e.g. identifying the type of compression software used to compress the communication, directing the government to the appropriate vendor that can provide decryption or decompression equipment, or providing the encryption key used to encrypt the communication) fully satisfies its obligation under the preceding sentence.

Reporting of DialedDialed Digits present in the content stream shall be performed on a per lawful authorization basis. DialedDialed Digit Reporting (DDR) requirements can be achieved with this standard by directing the intercept subject's media stream to the LEMF where the LEMF can isolate the DialedDialed Digits. Other methods for reporting of intercept subject DialedDialed Digits are for further study.

  NOTE: Dialed Digits are keypad digits 0, 1, 2, 3, 4, 5, 6, 7. 8, 9, *, and # entered by the intercept subject.

When lawfully authorized, a TSP shall be responsible for the interception of a target using IMS Conferencing Services.

The capabilities to lawfully intercept a target using IMS Conferencing Services is defined in Clause 11 of 3GPP TS 33.107 and Clause 11 of 3GPP TS 33.108 beginning with Release 10.

[Annex H Modification End]

6.11 Delta <16>: Delivery Method Clarification

This delta clarifies the use of TCP/IP or UDP/IP for the delivery of packet data communication content to an LEMF when the ULIC Header method is employed in the U.S. Changes are shown below in Annex C and Annex H.

[Annex C Modification Start]

ANNEX C (NORMATIVE): UMTS HI3 INTERFACE

There are two possible methods for delivery of content of communication to the LEMF standardized in this document:

-   UMTS LI Correlation Header (ULIC) via TCP/IP or UDP/IP. and UDP/TCP. TCP is the protocol preferred by law enforcement for IRI and CC delivery. If TCP is available, its use is assumed unless a different protocol is agreed to by the LEA and the service provider. The ULIC timestamp parameter is mandatory.
-   FTP

Two versions of ULIC are defined: version 0 and version 1.

ULICv1 shall be supported by the network and, optionally, ULICv0 may be supported by the network. When both are supported, ULICv1 is the default value. For systems deployed in the U.S., see Annex H.

C.1   UMTS LI CORRELATION HEADER

C.1.1 Introduction

The header and the payload of the communication between the intercepted subscriber and the other party (later called: Payload Information Element) is duplicated. A new header (later called: ULIC-Header) is added before it is sent to LEMF.

Data packets with the ULIC header shall be sent to the LEA via UDP/IP or TCP/IP. TCP is the protocol preferred by law enforcement for IRI and CC delivery. If TCP is available, its use is assumed unless a different protocol is agreed to by the LEA and the service provider. The timestamp parameter in ULIC is mandatory.

For systems deployed in the U.S., see Annex H.

[Annex C Modification End]

[Annex H Modification Start]

ANNEX H (NORMATIVE): UNITED STATES LAWFUL INTERCEPTION (PS DOMAIN AND IMS)

With respect to the handover interfaces they must be capable of delivering intercepted communications and IRI information to the government in a format such that they may be transmitted by means of equipment, facilities, or services procured by the government to a location other than the premises of the carrier.

With respect to location information 'when authorized' means the ability to provide location information on a per-surveillance basis.

The delivery methods described in this document are optional methods and no specific method is required in the United States. However, with respect to data packets delivered with the ULIC header sent to the LEA via UDP/IP or TCP/IP, the LEA's preference is ULICv1 via TCP/IP. When both TCP/IP and UDP/IP are supported, TCP/IP is the default transmission protocol used. The timestamp parameter in ULIC is mandatory.

The specification of lawful intercept capabilities in this document does not imply that those services supported by these lawful intercept capabilities are covered by CALEA. Inclusion of a capability in this document does not imply that capability is required by CALEA. This document is intended to satisfy the requirements of section 107 (a) (2) of the Communications Assistance for Law Enforcement Act, Pub. L. 103-414 such that a telecommunications carrier, manufacturer, or support service provider that is in compliance with this document shall have "Safe Harbor".

In the United States surveillance on the GGSN is not required, but is an option that may be negotiated between the service provider and law enforcement.

A TSP shall not be responsible for decrypting or decompressing, or ensuring the government's ability to decrypt or decompress, any communication encrypted or compressed by a subscriber or customer, unless the encryption or compression was provided by the TSP and the TSP possesses the information necessary to decrypt or decompress the communication. A TSP that provides the government with information about how to decrypt or decompress a communication (e.g. identifying the type of compression software used to compress the communication, directing the government to the appropriate vendor that can provide decryption or decompression equipment, or providing the encryption key used to encrypt the communication) fully satisfies its obligation under the preceding sentence.

Reporting of DialedDialed Digits present in the content stream shall be performed on a per lawful authorization basis. DialedDialed Digit Reporting (DDR) requirements can be achieved with this standard by directing the intercept subject's media stream to the LEMF where the LEMF can isolate the DialedDialed Digits. Other methods for reporting of intercept subject DialedDialed Digits are for further study.

   NOTE: Dialed Digits are keypad digits 0, 1, 2, 3, 4, 5, 6, 7. 8, 9, *, and # entered by the intercept subject.

[Annex H Modification End]

6.12 Delta <17>: UMTS IRI Packet Data Header Information Reporting

The following clauses: 2, 4.5.1, 6.5, 6.5.1.1, 6.6, and Annex B.3 have been modified to provide UMTS IRI Packet Data Header Information reporting to support U.S. national requirements. The deltas are shown below:

[Clause 2 Modification Start]

[69]   IETF RFC 2460: "Internet Protocol, Version 6 (IPv6) Specification".

[70]   IEFT RFC 3697: "IPv6 Flow Label Specification".

[Clause 2 Modification End]

[Clause 4.5.1 Modification Start]

4.5.1   Data transmission protocols

The protocol used by the "LI application" for the encoding and the sending of data between the MF and the LEMF is based on already standardized data transmission protocols like ROSE or FTP or TPKT/TCP/IP.

The specified data communication methods provide a general means of data communication between the LEA and the operator's (NO/AN/SP) mediation function. They are used for the delivery of:

-   HI2 type of information (IRI records);

-   Certain types of content of communication (e.g. SMS).

The present document specifies the use of the several possible methods for delivery: ROSE or FTP or TPKT/TCP/IP (specifications for this specific protocol are in Clause G.2 – "HI2 delivery methods". This protocol is defined by IETF RFC 2126: "ISO Transport Service on top of TCP (ITOT)" [28] on the application layer and the BER on the presentation layer. The lower layers for data communication may be chosen in agreement with the operator (NO/AN/SP) and the LEA.

The delivery to the LEMF should use the internet protocol stack.

> NOTE: TPKT/TCP/IP is recommended in the case of IRI only with the option of IRI Packet Data Header Information reporting.

[Clause 4.5.1 Modification End]

[Clause 6.5 Modification Start]

6.5   IRI for packet domain

The IRI will in principle be available in the following phases of a data transmission:

1. At connection attempt when the target identity becomes active, at which time packet transmission may or may not occur (set up of a data context, target may be the originating or terminating party);

2. At the end of a connection, when the target identity becomes inactive (removal of a data context);

3. At certain times when relevant information are available.

In addition, information on non-transmission related actions of a target constitute IRI and is sent via HI2, e.g. information on subscriber controlled input.

The IRI may be subdivided into the following categories:

1. Control information for HI2 (e.g. correlation information);

2. Basic data context information, for standard data transmission between two parties.

The events defined in [19] are used to generate records for the delivery via HI2.

There are eight different event types received at DF2 level. According to each event, a Record is sent to the LEMF if this is required. The following table gives the mapping between event type received at DF2 level and record type sent to the LEMF.

Table 6.1: Mapping between UMTS Data Events and HI2 records type

Event	IRI Record Type
GPRS attach	REPORT
GPRS detach	REPORT
PDP context activation (successful)	BEGIN
PDP context modification	CONTINUE
PDP context activation (unsuccessful)	REPORT
Start of intercept with PDP context active	BEGIN or optionally CONTINUE
PDP context deactivation	END
Location update	REPORT
SMS	REPORT
ServingSystem	REPORT
Packet Data Header Information	REPORT

A set of information is used to generate the records. The records used transmit the information from mediation function to LEMF. This set of information can be extended in the GSN or DF2 MF, if this is necessary in a specific country. The following table gives the mapping between information received per event and information sent in records.

Table 6.2: Mapping between Events information and IRI information

parameter	description	HI2 ASN.1 parameter
observed MSISDN	Target Identifier with the MSISDN of the target subscriber (monitored subscriber).	partyInformation (party-identiity)
observed IMSI	Target Identifier with the IMSI of the target subscriber (monitored subscriber).	partyInformation (party-identity)
observed IMEI	Target Identifier with the IMEI of the target subscriber (monitored subscriber)	partyInformation (party-identity)
observed PDP address	PDP address used by the target..	partyInformation (services-data-information)
event type	Description which type of event is delivered: PDP Context Activation, PDP Context Deactivation,GPRS Attach, etc.	gPRSevent
event date	Date of the event generation in the xGSN	timeStamp
event time	Time of the event generation in the xGSN	
access point name	The APN of the access point	partyInformation (services-data-information)
PDP type	This field describes the PDP type as defined in TS GSM 09.60, TS GSM 04.08, TS GSM 09.02	partyInformation (services-data-information)
initiator	This field indicates whether the PDP context activation, deactivation, or modification is MS directed or network initiated.	initiator
correlation number	Unique number for each PDP context delivered to the LEMF, to help the LEA, to have a correlation between each PDP Context and the IRI.	gPRSCorrelationNumber
lawful interception identifier	Unique number for each lawful authorization.	lawfulInterceptionIdentifier
location information	When authorized, this field provides the location information of the target that is present at the SGSN at the time of event record production.	locationOfTheTarget
SMS	The SMS content with header which is sent with the SMS-service	sMS
failed context activation reason	This field gives information about the reason for a failed context activation of the target subscriber.	gPRSOperationErrorCode
failed attach reason	This field gives information about the reason for a failed attach attempt of the target subscriber.	gPRSOperationErrorCode
service center address	This field identifies the address of the relevant server within the calling (if server is originating) or called (if server is terminating) party address parameters for SMS-MO or SMS-MT.	serviceCenterAddress

parameter	description	HI2 ASN.1 parameter
umts QOS	This field indicates the Quality of Service associated with the PDP Context procedure.	qOS
context deactivation reason	This field gives information about the reason for context deactivation of the target subscriber.	gPRSOperationErrorCode
network identifier	Operator ID plus SGSN, GGSN, or HLR address.	networkIdentifier
iP assignment	Observed PDP address is statically or dynamically assigned.	iP-assignment
SMS originating address	Identifies the originator of the SMS message.	DataNodeAddress
SMS terminating address	Identifies the intended recipient of the SMS message.	DataNodeAddress
SMS initiator	Indicates whether the SMS is MO, MT, or Undefined	sms-initiator
serving SGSN number	An E.164 number of the serving SGSN.	servingSGSN-Number
serving SGSN address	An IP address of the serving SGSN.	servingSGSN-Address
destination IP address	Identifies the destination IP address of a packet.	destinationIPAddress
destination port number	Identifies the destination port number of a packet.	destinationPortNumber
source IP address	Identifies the source IP address of a packet.	sourceIPAddress
source port number	Identifies the source port number of a packet.	sourcePortNumber
transport protocol	Identifies the transport protocol (i.e., Protocol Field in IPv4 or Next Header Field in IPv6).	transportProtocol
flow label	The field in the IPv6 header that is used by a source to label packets of a flow (see RFC 3697 [42]).	flowLabel
packet count	The number of packets detected and reported in a particular packet data summary report.	packetCount
packet size	The size of a packet (i.e., Total Length Field in IPv4 [40] or Payload Length Field in IPv6 [41]).	packetsize
packet direction	Identifies the direction of the intercepted packet (from subject or to subject).	packetDirection
packet header copy	Provides a copy of the packet headers including IP layer and next layer, and extensions, but excluding content.	packetHeaderCopy
summary period	Provides the period of time during which the packets of the summary report were sent or received by the subject.	summaryPeriod
sum of packet sizes	Sum of values in Total Length Fields in IPv4 packets or Payload Length Field in IPv6 packets.	sumOfPacketSizes
packet data summary reason	Provides the reason for a summary report.	packetDataSummaryReason
packet data summary	For each particular packet flow, identifies pertinent reporting information (e.g., source IP address, destination IP address, source port, destination port, transport protocol, packet count, time interval, sum of packet sizes) associated with the particular packet flow.	packetDataSummary

NOTE: LIID parameter must be present in each record sent to the LEMF.

[Clause 6.5 Modification End]

[Clause 6.5.1.1 Modification Start]

6.5.1.1   REPORT record information

The REPORT record is used to report non-communication related subscriber actions (events) and for reporting unsuccessful packet-mode communication attempts.

The REPORT record shall be triggered when:

- the intercept subject's mobile station performs a GPRS attach procedure (successful or unsuccessful);

- the intercept subject's mobile station performs a GPRS detach procedure;

- the intercept subject's mobile station is unsuccessful at performing a PDP context activation procedure;

- the intercept subject's mobile station performs a cell, routing area, or combined cell and routing area update;

  the intercept subject's mobile station sends an SMS-Mobile Originated (MO) communication. Dependent on national requirements, the triggering event shall occur either when the 3G SGSN receives the SMS from the target MS or, when the 3G SGSN receives notification that the SMS-Centre successfully received the SMS;

  for GSM and UMTS systems deployed in the U.S., a REPORT record shall be triggered when the 3G SGSN receives an SMS-MO communication from the intercept subject's mobile station;

- the intercept subject's mobile station receives a SMS Mobile-Terminated (MT) communication. Dependent on national requirements, the triggering event shall occur either when the 3G SGSN receives the SMS from the SMS-Centre or, when the 3G SGSN receives notification that the target MS successfully received the SMS;

  for GSM and UMTS systems deployed in the U.S., a REPORT record shall be triggered when the 3G SGSN receives an SMS-MT communication from the SMS-Centre destined for the intercept subject's mobile station;

- as a national option, a mobile terminal is authorized for service with another network operator or service provider.

- packet data header reporting is performed on an individual intercepted packet basis and a packet is detected as it is sent or received by the target for a packet-data communication PDP Context.;

- when packet data summary reporting is performed on an summary basis for a packet-data communication PDP Context associated with a particular packet flow (defined as the combination of source IP address, destination IP address, source port, destination port, protocol, for IPv6 also include the flow label, and PDP context) and:

  - the packet flow starts,

  - an interim packet summary report is to be provided, or

  - packet flow ends including the case where PDP Context is deactivated.

  An interim packet summary report is triggered if:

  - the expiration of a configurable Summary Timer per intercept occurs. The Summary Timer is configurable in units of seconds, or

  - a per-intercept configurable count threshold is reached.

Packet Data Header Information reporting is reported either on a per-packet (i.e., non-summarized) basis or in a summary report. These reports provide IRI associated with the packets detected. The Packet Data Header Information related REPORT record is used to convey Packet Data Header Information during an active packet-data communication PDP Context.

  NOTE: In the case of IP Fragments, Packet Data Header Information on a 6-tuple basis may only be available on the first packet and subsequent packets may not include such information and therefore may not be reported.

Table 6.9.a: Packet Data Header Information REPORT Record

Parameter	MOC	Description/Conditions
observed MSISDN observed IMSI observed IMEI	C	Provide at least one and others when available.
observed PDP address	M	Provide to identify the: - static address requested by the intercept subject's MS, and allocated by the Network for a successful PDP context activation. - address allocated dynamically by the network to the intercept subject MS in association with a PDP context activation (i.e., address is sent by the Network in an Activate PDP Context Accept) for a successful PDP context activation procedure when the PDP Context activation request does not contain a static PDP address. - address offered by the network in association with a network-initiated PDP context activation request when the intercept subject's MS accepts the network-initiated PDP context activation request.
event type	M	Provide the Packet Data Header Information event type.
event date event time	M	Provide the date and time the event is detected.
access point name	M	Provide to identify the packet data network to which the intercept subject is connected.
PDP type	M	Provide to describe the PDP type of the observed PDP address. The PDP Type defines the end user protocol to be used between the external packet data network and the MS.
network identifier	M	Shall be provided.
correlation number	M	Provide to uniquely identify the PDP context delivered to the LEMF used to correlate IRI records with CC.
lawful intercept identifier	M	Shall be provided.
packet data header information	M	Shall be provided to identify the Packet Data Header Information to be reported on a per-packet basis as defined in Table 6.b or on a summary basis. For summary reporting, includes one or more packet flow summaries where each packet flow summary is associated with a particular packet flow as defined in Table 6.c.

Table 6.9.b: Contents of per-packet, packet data header information parameter

Parameter	MOC	Description/Conditions
source IP address	C	Provide when mapping packet header information to identify the source IP address for a particular packet flow.
source port number	C	Provide when mapping packet header information to report the source port number for a particular packet flow when the transport protocol supports port numbers.
destination IP address	C	Provide when mapping packet header information to Identify the destination IP address for a particular packet flow.
destination port number	C	Provide when mapping packet header information to report the destination port number for a particular packet flow when the transport protocol supports port numbers.
transport protocol	C	Provide when mapping packet header information to identify the transport protocol (e.g., TCP) for a particular packet flow.
flow label	C	Provide when mapping packet header information for IPv6 only for a particular packet flow.
direction	M	Shall be provided. Identifies the direction of the packet (from subject or to subject).
packet size	O	Provide when mapping packet header information to convey the value contained in Total Length Fields of the IPv4 packets or the value contained in the Payload Length fields of the IPv6 packets.
packet data header copy	C	Provide when reporting a copy of the entire packet header information rather than mapping individual information.

Table 6.9.c: Contents of a single summary flow Packet Data Header Information parameter

Parameter	MOC	Description/Conditions
source IP address	M	Shall be provided. Identifies the source IP address for a particular packet flow.
source port number	C	Provide to report the source port number for a particular packet flow when the transport protocol supports port numbers.
destination IP address	M	Shall be provided. Identifies the destination IP address for a particular packet flow.
destination port number	C	Provide to report the destination port number for a particular packet flow when the transport protocol supports port numbers.
transport protocol	M	Identifies the transport protocol (e.g., TCP) for a particular packet flow.
flow label	C	Provide for IPv6 only for a particular packet flow.
summary period	M	Provides the period of time during which the packets of a particular packet flow of the summary report were sent or received by the subject and defined by specifying the time when the first packet and the last packet of the reporting period were detected.
packet count	M	Provides the number of packets detected for a particular packet flow.
sum of packet sizes	O	Provides the sum of values contained in Total Length Fields of the IPv4 packets or the sum of the values contained in the Payload Length fields of the IPv6 packets.
packet data summary reason	M	Provides the reason for the report being delivered to the LEMF (i.e., timeout, count limit, end of session).

[Clause 6.5.1.1 Modification End]

[Clause 6.6 Modification Start]

6.6 IRI reporting for packet domain at GGSN

As a national option, in the case where the GGSN is reporting IRI for an intercept subject, the intercept subject is handed off to another SGSN and the same GGSN continues to handle the content of communications subject to roaming agreements, the GGSN shall continue to report the following IRI of the content of communication:

- PDP context activation;

- PDP context deactivation;

- Start of interception with PDP context active;

- PDP context modification;

- Packet Data Header Information.

[Clause 6.6 Modification End]

[Clause B.3 Modification Start]

B.3   INTERCEPT RELATED INFORMATION (HI2 PS AND IMS)

Declaration of ROSE operation umts-sending-of-IRI is ROSE delivery mechanism specific. When using FTP delivery mechanism, data UmtsIRIsContent must be considered.

NOTE: The original 3GPP ASN.1 definitions are reproduced here only to show change-marked deltas. This ASN.1 definition should not be compiled and used in the same system as the original 3GPP OID (or with the other two described in this document), since that would collide with the original OID definition. There are three separate, unrelated, deltas to the original 3GPP OID defined in this document. These are combined in one ASN.1 object, that appears in Annex A. That object falls in the WTSC OID hierarchy, and should be used to replace the 3GPP HI2 objects in North American implementations.

```
UmtsHI2Operations {itu-t(0) identified-organization(4) etsi(0) securityDomain(2) lawfulintercept(2)
threeGPP(4) hi2(1) r6(6) version-6(6)}

DEFINITIONS IMPLICIT TAGS ::=

BEGIN

IMPORTS

    OPERATION,
    ERROR
        FROM Remote-Operations-Information-Objects
        {joint-iso-itu-t(2) remote-operations(4) informationObjects(5) version1(0)}

    LawfulInterceptionIdentifier,
    TimeStamp,
    Network-Identifier,
    National-Parameters,
    National-HI2-ASN1parameters,
    DataNodeAddress,
    IPAddress,
    IP-value,
    X25Address

        FROM HI2Operations
        {itu-t(0) identified-organization(4) etsi(0) securityDomain(2)
            lawfulIntercept(2) hi2(1) version5(5)}; -- Imported from TS 101 671


-- Object Identifier Definitions

-- Security DomainId
lawfulInterceptDomainId OBJECT IDENTIFIER ::= {itu-t(0) identified-organization(4) etsi(0)
securityDomain(2) lawfulIntercept(2)}

-- Security Subdomains
threeGPPSUBDomainId OBJECT IDENTIFIER ::= {lawfulInterceptDomainId threeGPP(4)}
hi2DomainId OBJECT IDENTIFIER ::= {threeGPPSUBDomainId hi2(1) r6(6) version-6(6)}

umts-sending-of-IRI  OPERATION ::=
{
    ARGUMENT UmtsIRIsContent
    ERRORS      { OperationErrors }
    CODE      global:{threeGPPSUBDomainId hi2(1) opcode(1)}
}
-- Class 2 operation . The timer shall be set to a value between 3 s and 240 s.
-- The timer.default value is 60s.
-- NOTE: The same note as for HI management operation applies.

UmtsIRIsContent      ::= CHOICE
{
    umtsiRIContent         UmtsIRIContent,
    umtsIRISequence        UmtsIRISequence
}

UmtsIRISequence      ::= SEQUENCE OF UmtsIRIContent

-- Aggregation of UmtsIRIContent is an optional feature.
-- It may be applied in cases when at a given point in time
-- several IRI records are available for delivery to the same LEA destination.
-- As a general rule, records created at any event shall be sent
-- immediately and not withheld in the DF or MF in order to
-- apply aggragation.
-- When aggregation is not to be applied,
-- UmtsIRIContent needs to be chosen.
```

```
UmtsIRIContent     ::= CHOICE
{
    iRI-Begin-record      [1] IRI-Parameters,  -- include at least one optional parameter
    iRI-End-record        [2] IRI-Parameters,
    iRI-Continue-record   [3] IRI-Parameters,  -- include at least one optional parameter
    iRI-Report-record     [4] IRI-Parameters   -- include at least one optional parameter
}

unknown-version       ERROR ::= { CODE local:0}
missing-parameter     ERROR ::= { CODE local:1}
unknown-parameter-value ERROR ::= { CODE local:2}
unknown-parameter     ERROR ::= { CODE local:3}

OperationErrors ERROR ::=
{
    unknown-version |
    missing-parameter |
    unknown-parameter-value |
    unknown-parameter
}
-- This values may be sent by the LEMF, when an operation or a parameter is misunderstood.

-- Parameters having the same tag numbers must be identical in Rel-5 and Rel-6 modules.
IRI-Parameters    ::= SEQUENCE
{
    hi2DomainId           [0]  OBJECT IDENTIFIER,  -- 3GPP HI2 domain
    iRIversion            [23] ENUMERATED
    {
        version2 (2),
        …,
        version3 (3),
        version4 (4),
            -- note that version5 (5) cannot be used as it was missed in the version 5 of this
            -- ASN.1 module.
        version6 (6)
    } OPTIONAL,
        -- if not present, it means version 1 is handled
    lawfulInterceptionIdentifier  [1] LawfulInterceptionIdentifier,
        -- This identifier is associated to the target.
    timeStamp             [3] TimeStamp,
        -- date and time of the event triggering the report.)
    initiator             [4] ENUMERATED
    {
        not-Available    (0),
        originating-Target  (1),
            -- in case of GPRS, this indicates that the PDP context activation, modification
            -- or deactivation is MS requested
        terminating-Target  (2),
            -- in case of GPRS, this indicates that the PDP context activation, modification or
            -- deactivation is network initiated
    ...
    } OPTIONAL,

    locationOfTheTarget    [8] Location OPTIONAL,
        -- location of the target subscriber
    partyInformation      [9] SET SIZE (1..10) OF PartyInformation OPTIONAL,
        -- This parameter provides the concerned party, the identiy(ies) of the party
        --)and all the information provided by the party.

    serviceCenterAddress [13] PartyInformation OPTIONAL,
        -- e.g. in case of SMS message this parameter provides the address of  the relevant
        -- server within the calling (if server is originating) or called (if server is
        -- terminating) party address parameters
    sMS                   [14] SMS-report OPTIONAL,
        -- this parameter provides the SMS content and associated information

    national-Parameters    [16] National-Parameters OPTIONAL,
    gPRSCorrelationNumber  [18] GPRSCorrelationNumber OPTIONAL,
    gPRSevent             [20] GPRSEvent OPTIONAL,
        -- This information is used to provide particular action of the target
        -- such as attach/detach
    sgsnAddress           [21] DataNodeAddress OPTIONAL,
    gPRSOperationErrorCode [22] GPRSOperationErrorCode OPTIONAL,
    ggsnAddress           [24] DataNodeAddress OPTIONAL,
```

```
    qOS                [25] UmtsQos OPTIONAL,
    networkIdentifier    [26] Network-Identifier OPTIONAL,
    sMSOriginatingAddress    [27] DataNodeAddress OPTIONAL,
    sMSTerminatingAddress    [28] DataNodeAddress OPTIONAL,
    iMSevent          [29] IMSevent OPTIONAL,
    sIPMessage        [30] OCTET STRING  OPTIONAL,
    servingSGSN-number   [31] OCTET STRING (SIZE (1..20)) OPTIONAL,
    servingSGSN-address   [32] OCTET STRING (SIZE (5..17))   OPTIONAL,
            -- Octets are coded according to 3GPP TS 23.003 [25]
    ...,
    packetDataHeaderInformation   [43] PacketDataHeaderInformation OPTIONAL,
        national-HI2-ASN1parameters [255] National-HI2-ASN1parameters   OPTIONAL
}
-- Parameters having the same tag numbers must be identical in Rel-5 and Rel-6 modules

-- PARAMETERS FORMATS

PartyInformation        ::= SEQUENCE
{
    party-Qualifier   [0]  ENUMERATED
    {
      gPRS-Target(3),
      ...
    },
    partyIdentity     [1] SEQUENCE
    {
      imei              [1] OCTET STRING (SIZE (8)) OPTIONAL,
         -- See MAP format [4]

      imsi              [3] OCTET STRING (SIZE (3..8)) OPTIONAL,
         -- See MAP format [4] International Mobile
         -- Station Identity E.212 number beginning with Mobile Country Code

      msISDN            [6] OCTET STRING (SIZE (1..9)) OPTIONAL,
         -- MSISDN of the target, encoded in the same format as the AddressString
         -- parameters defined in MAP format document [4], § 14.7.8

      e164-Format       [7] OCTET STRING    (SIZE (1 .. 25)) OPTIONAL,
         -- E164 address of the node in international format. Coded in the same format as
         -- the calling party number  parameter of the ISUP (parameter part:[5])

      sip-uri           [8] OCTET STRING  OPTIONAL,
         -- See [26]

      ...,
      tel-url           [9] OCTET STRING  OPTIONAL
         -- See [36]
    },

    services-Data-Information  [4] Services-Data-Information OPTIONAL,
       -- This parameter is used to transmit all the information concerning the
       -- complementary information associated to the basic data call
    ...
}

Location ::= SEQUENCE
{
    globalCellID      [2] GlobalCellID  OPTIONAL,
       --see MAP format (see [4])
    rAI               [4] Rai     OPTIONAL,
       -- the Routeing Area Identifier is coded in accordance with the § 10.5.5.15 of
       -- document [9] without the Routing Area Identification IEI (only the
       -- last 6 octets are used)
    gsmLocation       [5] GSMLocation OPTIONAL,
    umtsLocation      [6] UMTSLocation OPTIONAL,
    sAI               [7] Sai  OPTIONAL,
       -- format:  PLMN-ID  3 octets (no. 1 – 3)
       --          LAC      2 octets (no. 4 – 5)
       --          SAC      2 octets (no. 6 – 7)
       --          (according to 3GPP TS 25.413)
    ...
}

GlobalCellID   ::= OCTET STRING  (SIZE (5..7))
```

```
Rai            ::= OCTET STRING (SIZE (6))
Sai            ::=  OCTET STRING (SIZE (7))

GSMLocation    ::= CHOICE
{
   geoCoordinates    [1] SEQUENCE
   {
      latitude   [1]   PrintableString (SIZE(7..10)),
                    -- format :    XDDMMSS.SS
      longitude    [2]   PrintableString (SIZE(8..11)),
                    -- format :    XDDDMMSS.SS
      mapDatum   [3]  MapDatum DEFAULT wGS84,
      ...,
      azimuth        [4] INTEGER (0..359) OPTIONAL
         -- The azimuth is the bearing, relative to true north.
   },
      -- format :   XDDDMMSS.SS
      --            X         : N(orth), S(outh), E(ast), W(est)
      --          DD or DDD   : degrees (numeric characters)
      --          MM        : minutes (numeric characters)
      --          SS.SS        : seconds, the second part (.SS) is optionnal
      -- Example :
      --      latitude short form     N502312
      --      longitude long form     E1122312.18

   utmCoordinates [2] SEQUENCE
   {
      utm-East      [1] PrintableString (SIZE(10)),
      utm-North     [2] PrintableString (SIZE(7)),
         -- example  utm-East 32U0439955
         --       utm-North   5540736
      mapDatum   [3]  MapDatum DEFAULT wGS84,
      ...,
      azimuth        [4] INTEGER (0..359) OPTIONAL
         -- The azimuth is the bearing, relative to true north.
   },

   utmRefCoordinates    [3] SEQUENCE
   {
      utmref-string     PrintableString (SIZE(13)),
      mapDatum       MapDatum DEFAULT wGS84,
      ...
   },
      -- example  32UPU91294045

   wGS84Coordinates    [4] OCTET STRING
      -- format is as defined in [37]; polygon type of shape is not allowed.
}

MapDatum ::= ENUMERATED
{
   wGS84,
   wGS72,
   eD50,    -- European Datum 50
   ...
}

UMTSLocation ::= CHOICE {
   point            [1]  GA-Point,
   pointWithUnCertainty [2]   GA-PointWithUnCertainty,
   polygon          [3]   GA-Polygon
}

GeographicalCoordinates ::= SEQUENCE {
   latitudeSign      ENUMERATED { north, south },
   latitude          INTEGER (0..8388607),
   longitude          INTEGER (-8388608..8388607),
   ...
}

GA-Point ::= SEQUENCE {
   geographicalCoordinates   GeographicalCoordinates,
   ...
}
```

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```
GA-PointWithUnCertainty ::=SEQUENCE {
   geographicalCoordinates    GeographicalCoordinates,
   uncertaintyCode            INTEGER (0..127)
}

maxNrOfPoints                 INTEGER ::= 15

GA-Polygon ::= SEQUENCE (SIZE (1..maxNrOfPoints)) OF
   SEQUENCE {
      geographicalCoordinates    GeographicalCoordinates,
      ...
   }

SMS-report      ::= SEQUENCE
{
   sMS-Contents   [3] SEQUENCE
   {
      sms-initiator     [1] ENUMERATED    -- party which sent the  SMS
      {
         target          (0),
         server          (1),
         undefined-party  (2),
         ...
      },
      transfer-status      [2] ENUMERATED
      {
         succeed-transfer  (0),     -- the transfer of the SMS message succeeds
         not-succeed-transfer(1),
         undefined        (2),
         ...
      } OPTIONAL,
      other-message     [3] ENUMERATED    -- in case of terminating call, indicates if
                            -- the server will send other SMS
      {
         yes          (0),
         no        (1),
         undefined   (2),
         ...
      } OPTIONAL,
      content           [4] OCTET STRING (SIZE (1 .. 270)) OPTIONAL,
                         -- Encoded in the format defined for the SMS mobile
      ...
   }
}

GPRSCorrelationNumber ::= OCTET STRING (SIZE(8..20))

GPRSEvent ::= ENUMERATED
{
   pDPContextActivation               (1),
   startOfInterceptionWithPDPContextActive      (2),
   pDPContextDeactivation             (4),
   gPRSAttach              (5),
   gPRSDetach              (6),
   locationInfoUpdate            (10),
   sMS              (11),
   pDPContextModification          (13),
   servingSystem            (14),
   ...,
      packetDataHeaderInformation         (16)
}
-- see [19]

IMSevent ::= ENUMERATED
{
   unfilteredSIPmessage (1),
      -- This value indicates to LEMF that the whole SIP message is sent.

   ...,
   sIPheaderOnly (2)
      -- If warrant requires only IRI then specific content in a 'sIPMessage'
      -- (e.g. 'Message', etc.) has been deleted before sending it to LEMF.
}
```

```
Services-Data-Information ::= SEQUENCE
{
    gPRS-parameters [1] GPRS-parameters OPTIONAL,
    ...
}

GPRS-parameters ::= SEQUENCE
{
    pDP-address-allocated-to-the-target    [1] DataNodeAddress OPTIONAL,
    aPN              [2] OCTET STRING (SIZE(1..100)) OPTIONAL,
    pDP-type          [3] OCTET STRING (SIZE(2)) OPTIONAL,
    ...
}

GPRSOperationErrorCode ::= OCTET STRING
-- The parameter shall carry the GMM cause value or the SM cause value, as defined in the
-- standard [9], without the IEI.


UmtsQos ::= CHOICE
{
    qosMobileRadio [1] OCTET STRING,
        -- The qosMobileRadio parameter shall be coded in accordance with the § 10.5.6.5 of
        -- document [9] without the Quality of service IEI and Length of
        -- quality of service IE (. That is, first
        -- two octets carrying 'Quality of service IEI' and 'Length of quality of service
        -- IE' shall be excluded).
    qosGn [2] OCTET STRING
        -- qosGn parameter shall be coded in accordance with § 7.7.34 of document [17]
}

PacketDataHeaderInformation ::= CHOICE
{

    packetDataHeader      [1]   PacketDataHeader,
    packetDataSummary [2]   PacketDataSummary,
...
}

PacketDataHeader ::= CHOICE
{

    packetDataHeaderMapped  [1]   PacketDataHeaderMapped,
    packetDataHeaderCopy [2]   PacketDataHeaderCopy,
...
}

PacketDataHeaderMapped ::= SEQUENCE OF
{
    sourceIPAddress       [1] IPAddress,
    sourcePortNumber      [2] INTEGER (0..65535) OPTIONAL,
    destinationIPAddress     [3] IPAddress,
    destinationPortNumber      [4] INTEGER (0..65535) OPTIONAL,
    transportProtocol     [5] INTEGER,
    -- For IPv4, report the "Protocol" field and for IPv6 report "Next Header" field.
    -- Assigned Internet Protocol Numbers can be found at
    -- http://www.iana.org/assignments/protocol-numbers/protocol-numbers.xml
    packetsize       [6] INTEGER OPTIONAL,
    flowLabel       [7] INTEGER OPTIONAL,
    direction       [9] TPDU-direction,
...
}


TPDU-direction ::= ENUMERATED
{
    from-target      (1),
    to-target      (2),
    unknown      (3)
}

PacketDataHeaderCopy ::= SEQUENCE OF
{
```

```
   direction      [1] TPDU-direction,
   headerCopy     [2] OCTET STRING, -- includes a copy of the packet header at the IP
           -- network layer and above including extension headers, but excluding contents.
...
}


PacketDataSummary ::= SEQUENCE OF PacketFlowSummary

PacketFlowSummary ::= SEQUENCE
{

   sourceIPAddress      [1] IPAddress,
   sourcePortNumber     [2] INTEGER (0..65535) OPTIONAL,
   destinationIPAddress   [3] IPAddress,
   destinationPortNumber     [4] INTEGER (0..65535) OPTIONAL,
   transportProtocol    [5] INTEGER,
   -- For IPv4, report the "Protocol" field and for IPv6 report "Next Header" field.
   -- Assigned Internet Protocol Numbers can be found at
   -- http://www.iana.org/assignments/protocol-numbers/protocol-numbers.xml
   flowLabel         [6] INTEGER OPTIONAL,
   summaryPeriod         [7] ReportInteval,
   packetCount       [8] INTEGER,
   sumOfPacketSizes     [9] INTEGER OPTIONAL,
   packetDataSummaryReason [10] ReportReason,
...
}

ReportReason ::= ENUMERATED
{
   timerExpired        [0],
   countThresholdHit   [1],
   pDPContextDeactivated     [2],
   pDPContextModification    [3],
   other or unknown      [4],
   ...
}

ReportInterval ::= SEQUENCE
{
   firstPacketTimeStamp    [0] TimeStamp,
   lastPacketTimeStamp     [1] TimeStamp,
   ...
}

END -- OF UmtsHI2Operations
```

[Clause B.3 Modification End]

6.13 Delta <18>: UMTS Start of interception for already attached UE Reporting

3GPP TS 33.108 Release 6 does not address the cases when interception starts for an already attached UE with no PDP context. When LI is activated after UE has already attached to the network, an IRI-Report-record with new GPRSevent "Start of interception" shall be sent.

Clauses affected in 3GPP TS 33.108: 6.5; 6.5.1.1; B.3.

[Clause 6.5 Modification Start]

6.5 IRI for packet domain

The IRI will in principle be available in the following phases of a data transmission:

1. At connection attempt when the target identity becomes active, at which time packet transmission may or may not occur (set up of a data context, target may be the originating or terminating party);

2. At the end of a connection, when the target identity becomes inactive (removal of a data context);

3. At certain times when relevant information are available.

In addition, information on non-transmission related actions of a target constitute IRI and is sent via HI2, e.g. information on subscriber controlled input.

The IRI may be subdivided into the following categories:

1. Control information for HI2 (e.g. correlation information);

2. Basic data context information, for standard data transmission between two parties.

The events defined in [19] are used to generate records for the delivery via HI2.

There are several different event types received at DF2 level. According to each event, a Record is sent to the LEMF if this is required. The following table gives the mapping between event type received at DF2 level and record type sent to the LEMF.

Table 6.1: Mapping between UMTS Data Events and HI2 records type

Event	IRI Record Type
GPRS attach	REPORT
GPRS detach	REPORT
PDP context activation (successful)	BEGIN
PDP context modification	CONTINUE
PDP context activation (unsuccessful)	REPORT
Start of interception with mobile station attached (national option)	REPORT
Start of interception with PDP context active	BEGIN or optionally CONTINUE
PDP context deactivation	END
Location update	REPORT
SMS	REPORT
ServingSystem	REPORT

A set of information is used to generate the records. The records used transmit the information from mediation function to LEMF. This set of information can be extended in the GSN or DF2 MF, if this is necessary in a specific country. The following table gives the mapping between information received per event and information sent in records.

Table 6.2: Mapping between Events information and IRI information

parameter	description	HI2 ASN.1 parameter
observed MSISDN	Target Identifier with the MSISDN of the target subscriber (monitored subscriber).	partyInformation (party-identiity)
observed IMSI	Target Identifier with the IMSI of the target subscriber (monitored subscriber).	partyInformation (party-identity)
observed IMEI	Target Identifier with the IMEI of the target subscriber (monitored subscriber)	partyInformation (party-identity)
observed PDP address	PDP address used by the target.	partyInformation (services-data-information)
event type	Description which type of event is delivered: PDP Context Activation, PDP Context Deactivation,GPRS Attach, etc.	gPRSevent
event date	Date of the event generation in the xGSN	timeStamp
event time	Time of the event generation in the xGSN	
access point name	The APN of the access point	partyInformation (services-data-information)
PDP type	This field describes the PDP type as defined in TS GSM 09.60, TS GSM 04.08, TS GSM 09.02	partyInformation (services-data-information)
initiator	This field indicates whether the PDP context activation, deactivation, or modification is MS directed or network initiated.	initiator
correlation number	Unique number for each PDP context delivered to the LEMF, to help the LEA, to have a correlation between each PDP Context and the IRI.	gPRSCorrelationNumber

parameter	description	HI2 ASN.1 parameter
lawful interception identifier	Unique number for each lawful authorization.	lawfulInterceptionIdentifier
location information	When authorized, this field provides the location information of the target that is present at the SGSN at the time of event record production.	locationOfTheTarget
SMS	The SMS content with header which is sent with the SMS-service	sMS
failed context activation reason	This field gives information about the reason for a failed context activation of the target subscriber.	gPRSOperationErrorCode
failed attach reason	This field gives information about the reason for a failed attach attempt of the target subscriber.	gPRSOperationErrorCode
service center address	This field identifies the address of the relevant server within the calling (if server is originating) or called (if server is terminating) party address parameters for SMS-MO or SMS-MT.	serviceCenterAddress
umts QOS	This field indicates the Quality of Service associated with the PDP Context procedure.	qOS
context deactivation reason	This field gives information about the reason for context deactivation of the target subscriber.	gPRSOperationErrorCode
network identifier	Operator ID plus SGSN, GGSN, or HLR address.	networkIdentifier
iP assignment	Observed PDP address is statically or dynamically assigned.	iP-assignment
SMS originating address	Identifies the originator of the SMS message.	DataNodeAddress
SMS terminating address	Identifies the intended recipient of the SMS message.	DataNodeAddress
SMS initiator	Indicates whether the SMS is MO, MT, or Undefined	sms-initiator
serving SGSN number	An E.164 number of the serving SGSN.	servingSGSN-Number
serving SGSN address	An IP address of the serving SGSN.	servingSGSN-Address

NOTE: LIID parameter must be present in each record sent to the LEMF.

6.5.1 Events and information

This clause describes the information sent from the Delivery Function (DF) to the Law Enforcement Monitoring Facility (LEMF) to support Lawfully Authorized Electronic Surveillance (LAES). The information is described as records and information carried by a record. This focus is on describing the information being transferred to the LEMF.

The IRI events and data are encoded into records as defined in the Table 6-1 Mapping between GPRS Events and HI2 records type and Annex B.3 Intercept related information (HI2). IRI is described in terms of a 'causing event' and information associated with that event. Within each IRI Record there is a set of events and associated information elements to support the particular service.

The communication events described in Table 6-1: Mapping between GPRS Events and HI2 record type and Table 6-2: Mapping between Events information and IRI information convey the basic information for reporting the disposition of a communication. This clause describes those events and supporting information.

Each record described in this clause consists of a set of parameters. Each parameter is either:

mandatory (M) - required for the record,

conditional (C) - required in situations where a condition is met (the condition is given in the Description), or

optional (O)   - provided at the discretion of the implementation.

The information to be carried by each parameter is identified. Both optional and conditional parameters are considered to be OPTIONAL syntactically in ASN.1 Stage 3 descriptions. The Stage 2 inclusion takes precedence over Stage 3 syntax.

6.5.1.1   REPORT record information

The REPORT record is used to report non-communication related subscriber actions (events) and for reporting unsuccessful packet-mode communication attempts.

The REPORT record shall be triggered when:

- the intercept subject's mobile station performs a GPRS attach procedure (successful or unsuccessful);

- the intercept subject's mobile station performs a GPRS detach procedure;

- the intercept subject's mobile station is unsuccessful at performing a PDP context activation procedure;

- the intercept subject's mobile station performs a cell, routing area, or combined cell and routing area update;

- the interception is activated after intercept subject's mobile station has successfully performed GPRS attach procedure;

- the intercept subject's mobile station sends an SMS-Mobile Originated (MO) communication. Dependent on national requirements, the triggering event shall occur either when the 3G SGSN receives the SMS from the target MS or, when the 3G SGSN receives notification that the SMS-Centre successfully received the SMS;

    for GSM and UMTS systems deployed in the U.S., a REPORT record shall be triggered when the 3G SGSN receives an SMS-MO communication from the intercept subject's mobile station;

- the intercept subject's mobile station receives a SMS Mobile-Terminated (MT) communication. Dependent on national requirements, the triggering event shall occur either when the 3G SGSN receives the SMS from the SMS-Centre or, when the 3G SGSN receives notification that the target MS successfully received the SMS;

    for GSM and UMTS systems deployed in the U.S., a REPORT record shall be triggered when the 3G SGSN receives an SMS-MT communication from the SMS-Centre destined for the intercept subject's mobile station;

- as a national option, a mobile terminal is authorized for service with another network operator or service provider.

Table 6.9: Start Of Interception with mobile station attached REPORT Record

Parameter	MOC	Description/Conditions
observed MSISDN		
observed IMSI	C	Provide at least one and others when available.
observed IMEI		
event type	C	Provide Start Of Interception with mobile station attached event type.
event date	M	Provide the date and time the event is detected.
event time		
network identifier	M	Shall be provided.
lawful intercept identifier	M	Shall be provided.
location information	C	Provide, when authorized, to identify location information for the intercept subject's MS.

Start Of Interception with mobile station attached REPORT Record shall be sent in the following case:

- the interception is activated any time after intercept subject's mobile station has successfully performed GPRS attach procedure.

[Clause 6.5 Modification End]

[Clause B Modification Start]

B.3 INTERCEPT RELATED INFORMATION (HI2 PS AND IMS)

Declaration of ROSE operation umts-sending-of-IRI is ROSE delivery mechanism specific. When using FTP delivery mechanism, data UmtsIRIsContent must be considered.

ASN1 description of IRI (HI2 interface)

NOTE: The original 3GPP ASN.1 definitions are reproduced here only to show change-marked deltas. This ASN.1 definition should not be compiled and used in the same system as the original 3GPP OID (or with the other two described in this document), since that would collide with the original OID definition. There are three separate, unrelated, deltas to the original 3GPP OID defined in this document. These are combined in one ASN.1 object, that appears in Annex A. That object falls in the WTSC OID hierarchy, and should be used to replace the 3GPP HI2 objects in North American implementations.

```
UmtsHI2Operations {itu-t(0) identified-organization(4) etsi(0) securityDomain(2) lawfulintercept(2)
threeGPP(4) hi2(1) r6(6) version-6(6)}

DEFINITIONS IMPLICIT TAGS ::=

BEGIN

IMPORTS

     OPERATION,
     ERROR
        FROM Remote-Operations-Information-Objects
        {joint-iso-itu-t(2) remote-operations(4) informationObjects(5) version1(0)}

     LawfulInterceptionIdentifier,
     TimeStamp,
     Network-Identifier,
     National-Parameters,
     National-HI2-ASN1parameters,
     DataNodeAddress,
     IPAddress,
     IP-value,
     X25Address

        FROM HI2Operations
        {itu-t(0) identified-organization(4) etsi(0) securityDomain(2)
            lawfulIntercept(2) hi2(1) version5(5)}; -- Imported from TS 101 671


-- Object Identifier Definitions

-- Security DomainId
lawfulInterceptDomainId OBJECT IDENTIFIER ::= {itu-t(0) identified-organization(4) etsi(0)
securityDomain(2) lawfulIntercept(2)}

-- Security Subdomains
threeGPPSUBDomainId OBJECT IDENTIFIER ::= {lawfulInterceptDomainId threeGPP(4)}
hi2DomainId OBJECT IDENTIFIER ::= {threeGPPSUBDomainId hi2(1) r6(6) version-6(6)}

umts-sending-of-IRI  OPERATION ::=
{
   ARGUMENT UmtsIRIsContent
   ERRORS      { OperationErrors }
   CODE     global:{threeGPPSUBDomainId hi2(1) opcode(1)}
}
-- Class 2 operation . The timer shall be set to a value between 3 s and 240 s.
-- The timer.default value is 60s.
-- NOTE: The same note as for HI management operation applies.

UmtsIRIsContent      ::= CHOICE
{
   umtsiRIContent       UmtsIRIContent,
   umtsIRISequence       UmtsIRISequence
}

UmtsIRISequence      ::= SEQUENCE OF UmtsIRIContent

-- Aggregation of UmtsIRIContent is an optional feature.
-- It may be applied in cases when at a given point in time
-- several IRI records are available for delivery to the same LEA destination.
-- As a general rule, records created at any event shall be sent
```

```
-- immediately and not withheld in the DF or MF in order to
-- apply aggragation.
-- When aggregation is not to be applied,
-- UmtsIRIContent needs to be chosen.


UmtsIRIContent    ::= CHOICE
{
    iRI-Begin-record     [1] IRI-Parameters,  -- include at least one optional parameter
    iRI-End-record       [2] IRI-Parameters,
    iRI-Continue-record    [3] IRI-Parameters,  -- include at least one optional parameter
    iRI-Report-record    [4] IRI-Parameters   -- include at least one optional parameter
}

unknown-version       ERROR ::= { CODE local:0}
missing-parameter     ERROR ::= { CODE local:1}
unknown-parameter-value ERROR ::= { CODE local:2}
unknown-parameter     ERROR ::= { CODE local:3}

OperationErrors ERROR ::=
{
    unknown-version |
    missing-parameter |
    unknown-parameter-value |
    unknown-parameter
}
-- This values may be sent by the LEMF, when an operation or a parameter is misunderstood.

-- Parameters having the same tag numbers must be identical in Rel-5 and Rel-6 modules.
IRI-Parameters    ::= SEQUENCE
{
    hi2DomainId         [0]  OBJECT IDENTIFIER,  -- 3GPP HI2 domain
    iRIversion          [23] ENUMERATED
    {
        version2 (2),
        …,
        version3 (3),
        version4 (4),
            -- note that version5 (5) cannot be used as it was missed in the version 5 of this
            -- ASN.1 module.
        version6 (6)
    } OPTIONAL,
        -- if not present, it means version 1 is handled
    lawfulInterceptionIdentifier  [1] LawfulInterceptionIdentifier,
        -- This identifier is associated to the target.
    timeStamp           [3] TimeStamp,
        -- date and time of the event triggering the report.)
    initiator           [4] ENUMERATED
    {
        not-Available     (0),
        originating-Target  (1),
            -- in case of GPRS, this indicates that the PDP context activation, modification
            -- or deactivation is MS requested
        terminating-Target  (2),
            -- in case of GPRS, this indicates that the PDP context activation, modification or
            -- deactivation is network initiated
    ...
    } OPTIONAL,

    locationOfTheTarget     [8] Location OPTIONAL,
        -- location of the target subscriber
    partyInformation     [9] SET SIZE (1..10) OF PartyInformation OPTIONAL,
        -- This parameter provides the concerned party, the identiy(ies) of the party
        --)and all the information provided by the party.

    serviceCenterAddress [13] PartyInformation OPTIONAL,
        -- e.g. in case of SMS message this parameter provides the address of  the relevant
        -- server within the calling (if server is originating) or called (if server is
        -- terminating) party address parameters
    sMS                 [14] SMS-report OPTIONAL,
        -- this parameter provides the SMS content and associated information

    national-Parameters     [16] National-Parameters OPTIONAL,
    gPRSCorrelationNumber   [18] GPRSCorrelationNumber OPTIONAL,
```

```
gPRSevent          [20] GPRSEvent OPTIONAL,
    -- This information is used to provide particular action of the target
    -- such as attach/detach
sgsnAddress        [21] DataNodeAddress OPTIONAL,
gPRSOperationErrorCode [22] GPRSOperationErrorCode OPTIONAL,
ggsnAddress        [24] DataNodeAddress OPTIONAL,
qOS                [25] UmtsQos OPTIONAL,
networkIdentifier  [26] Network-Identifier OPTIONAL,
sMSOriginatingAddress [27] DataNodeAddress OPTIONAL,
sMSTerminatingAddress [28] DataNodeAddress OPTIONAL,
iMSevent           [29] IMSevent OPTIONAL,
sIPMessage         [30] OCTET STRING  OPTIONAL,
servingSGSN-number [31] OCTET STRING (SIZE (1..20)) OPTIONAL,
servingSGSN-address [32] OCTET STRING (SIZE (5..17))   OPTIONAL,
                   -- Octets are coded according to 3GPP TS 23.003 [25]
    ...,
    national-HI2-ASN1parameters   [255] National-HI2-ASN1parameters   OPTIONAL
}
-- Parameters having the same tag numbers must be identical in Rel-5 and Rel-6 modules

-- PARAMETERS FORMATS

PartyInformation        ::= SEQUENCE
{
    party-Qualifier   [0]  ENUMERATED
    {
       gPRS-Target(3),
       ...
    },
    partyIdentity     [1] SEQUENCE
    {
       imei            [1] OCTET STRING (SIZE (8)) OPTIONAL,
          -- See MAP format [4]

       imsi            [3] OCTET STRING (SIZE (3..8)) OPTIONAL,
          -- See MAP format [4] International Mobile
          -- Station Identity E.212 number beginning with Mobile Country Code

       msISDN          [6] OCTET STRING (SIZE (1..9)) OPTIONAL,
          -- MSISDN of the target, encoded in the same format as the AddressString
          -- parameters defined in MAP format document [4], § 14.7.8

       e164-Format     [7] OCTET STRING   (SIZE (1 .. 25)) OPTIONAL,
          -- E164 address of the node in international format. Coded in the same format as
          -- the calling party number  parameter of the ISUP (parameter part:[5])

       sip-uri         [8] OCTET STRING  OPTIONAL,
          -- See [26]

       ...,
       tel-url         [9] OCTET STRING  OPTIONAL
          -- See [36]
    },

    services-Data-Information  [4] Services-Data-Information OPTIONAL,
       -- This parameter is used to transmit all the information concerning the
       -- complementary information associated to the basic data call
    ...
}

Location ::= SEQUENCE
{
    globalCellID    [2] GlobalCellID  OPTIONAL,
       --see MAP format (see [4])
    rAI             [4] Rai      OPTIONAL,
       -- the Routeing Area Identifier is coded in accordance with the § 10.5.5.15 of
       -- document [9] without the Routing Area Identification IEI (only the
       -- last 6 octets are used)
    gsmLocation     [5] GSMLocation OPTIONAL,
    umtsLocation    [6] UMTSLocation OPTIONAL,
    sAI             [7] Sai OPTIONAL,
       -- format:  PLMN-ID  3 octets (no. 1 – 3)
       --          LAC      2 octets (no. 4 – 5)
       --          SAC      2 octets (no. 6 – 7)
```

```
   --        (according to 3GPP TS 25.413)
   ...
}

GlobalCellID   ::= OCTET STRING (SIZE (5..7))
Rai            ::= OCTET STRING (SIZE (6))
Sai            ::=  OCTET STRING (SIZE (7))

GSMLocation    ::= CHOICE
{
   geoCoordinates    [1] SEQUENCE
   {
      latitude    [1]   PrintableString (SIZE(7..10)),
                        -- format :    XDDMMSS.SS
      longitude   [2]   PrintableString (SIZE(8..11)),
                        -- format :    XDDDMMSS.SS
      mapDatum    [3]   MapDatum DEFAULT wGS84,
      ...,
      azimuth     [4] INTEGER (0..359) OPTIONAL
         -- The azimuth is the bearing, relative to true north.
   },
      -- format :    XDDDMMSS.SS
      --             X         : N(orth), S(outh), E(ast), W(est)
      --           DD or DDD   : degrees (numeric characters)
      --           MM       : minutes (numeric characters)
      --           SS.SS       : seconds, the second part (.SS) is optionnal
      -- Example :
      --      latitude short form     N502312
      --      longitude long form     E1122312.18

   utmCoordinates [2] SEQUENCE
   {
      utm-East     [1] PrintableString (SIZE(10)),
      utm-North    [2] PrintableString (SIZE(7)),
         -- example  utm-East 32U0439955
         --      utm-North   5540736
      mapDatum    [3]   MapDatum DEFAULT wGS84,
      ...,
      azimuth       [4] INTEGER (0..359) OPTIONAL
         -- The azimuth is the bearing, relative to true north.
   },

   utmRefCoordinates    [3] SEQUENCE
   {
      utmref-string     PrintableString (SIZE(13)),
      mapDatum      MapDatum DEFAULT wGS84,
      ...
   },
      -- example  32UPU91294045

   wGS84Coordinates     [4] OCTET STRING
      -- format is as defined in [37]; polygon type of shape is not allowed.
}

MapDatum ::= ENUMERATED
{
   wGS84,
   wGS72,
   eD50,    -- European Datum 50
   ...
}

UMTSLocation ::= CHOICE {
   point           [1]  GA-Point,
   pointWithUnCertainty [2]   GA-PointWithUnCertainty,
   polygon             [3]   GA-Polygon
}

GeographicalCoordinates ::= SEQUENCE {
   latitudeSign        ENUMERATED { north, south },
   latitude            INTEGER (0..8388607),
   longitude           INTEGER (-8388608..8388607),
   ...
}
```

```
GA-Point ::= SEQUENCE {
   geographicalCoordinates    GeographicalCoordinates,
   ...
}

GA-PointWithUnCertainty ::=SEQUENCE {
   geographicalCoordinates    GeographicalCoordinates,
   uncertaintyCode            INTEGER (0..127)
}

maxNrOfPoints                 INTEGER ::= 15

GA-Polygon ::= SEQUENCE (SIZE (1..maxNrOfPoints)) OF
   SEQUENCE {
      geographicalCoordinates    GeographicalCoordinates,
      ...
   }

SMS-report     ::= SEQUENCE
{
   sMS-Contents   [3] SEQUENCE
   {
      sms-initiator    [1] ENUMERATED    -- party which sent the  SMS
      {
         target         (0),
         server         (1),
         undefined-party  (2),
         ...
      },
      transfer-status      [2] ENUMERATED
      {
         succeed-transfer  (0),      -- the transfer of the SMS message succeeds
         not-succeed-transfer(1),
         undefined         (2),
         ...
      } OPTIONAL,
      other-message    [3] ENUMERATED    -- in case of terminating call, indicates if
                              -- the server will send other SMS
      {
         yes         (0),
         no       (1),
         undefined   (2),
         ...
      } OPTIONAL,
      content          [4] OCTET STRING (SIZE (1 .. 270)) OPTIONAL,
                          -- Encoded in the format defined for the SMS mobile
      ...
   }
}

GPRSCorrelationNumber ::= OCTET STRING (SIZE(8..20))

GPRSEvent ::= ENUMERATED
{
   pDPContextActivation                (1),
   startOfInterceptionWithPDPContextActive     (2),
   pDPContextDeactivation              (4),
   gPRSAttach               (5),
   gPRSDetach               (6),
   locationInfoUpdate            (10),
   sMS                (11),
   pDPContextModification           (13),
   servingSystem            (14),
   ...,
   startOfInterceptionWithMSAttached       (15)

}
-- see [19]

IMSevent ::= ENUMERATED
{
   unfilteredSIPmessage (1),
      -- This value indicates to LEMF that the whole SIP message is sent.
```

```
   ...,
   sIPheaderOnly (2)
      -- If warrant requires only IRI then specific content in a 'sIPMessage'
      -- (e.g. 'Message', etc.) has been deleted before sending it to LEMF.
}

Services-Data-Information ::= SEQUENCE
{
   gPRS-parameters [1] GPRS-parameters OPTIONAL,
   ...
}

GPRS-parameters ::= SEQUENCE
{
   pDP-address-allocated-to-the-target    [1] DataNodeAddress OPTIONAL,
   aPN              [2] OCTET STRING (SIZE(1..100)) OPTIONAL,
   pDP-type            [3] OCTET STRING (SIZE(2)) OPTIONAL,
   ...
}

GPRSOperationErrorCode ::= OCTET STRING
-- The parameter shall carry the GMM cause value or the SM cause value, as defined in the
-- standard [9], without the IEI.


UmtsQos ::= CHOICE
{
   qosMobileRadio [1] OCTET STRING,
      -- The qosMobileRadio parameter shall be coded in accordance with the § 10.5.6.5 of
      -- document [9] without the Quality of service IEI and Length of
      -- quality of service IE (. That is, first
      -- two octets carrying 'Quality of service IEI' and 'Length of quality of service
      -- IE' shall be excluded).
   qosGn [2] OCTET STRING
      -- qosGn parameter shall be coded in accordance with § 7.7.34 of document [17]
}

END -- OF UmtsHI2Operations
```

 [Clause B Modification End]

6.14 Delta <19>: OCTET STRING Encoding Correction

3GPP TS 33.108 Release 6 utilizes the OCTET STRING coding format in the ASN.1 and in a number of cases the coding of the contents is undefined. The changes shown clarify the instances of the vague use of OCTET STRING to enable Law Enforcement to correctly decode the contents.

Clause affected in 33.108: Annex B.3.

[Clause B.3 Modification Start]

B.3   INTERCEPT RELATED INFORMATION (HI2 PS AND IMS)

Declaration of ROSE operation umts-sending-of-IRI is ROSE delivery mechanism specific. When using FTP delivery mechanism, data UmtsIRIsContent must be considered.

ASN1 description of IRI (HI2 interface)

NOTE: The original 3GPP ASN.1 definitions are reproduced here only to show change-marked deltas. This ASN.1 definition should not be compiled and used in the same system as the original 3GPP OID (or with the other two described in this document), since that would collide with the original OID definition. There are three separate, unrelated, deltas to the original 3GPP OID defined in this document. These are combined in one ASN.1 object, that appears in Annex A. That object falls in the WTSC OID hierarchy, and should be used to replace the 3GPP HI2 objects in North American implementations.

```
UmtsHI2Operations {itu-t(0) identified-organization(4) etsi(0) securityDomain(2) lawfulintercept(2)
threeGPP(4) hi2(1) r6(6) version-6(6)}

DEFINITIONS IMPLICIT TAGS ::=

BEGIN

IMPORTS

     OPERATION,
     ERROR
        FROM Remote-Operations-Information-Objects
        {joint-iso-itu-t(2) remote-operations(4) informationObjects(5) version1(0)}

     LawfulInterceptionIdentifier,
     TimeStamp,
     Network-Identifier,
     National-Parameters,
     National-HI2-ASN1parameters,
     DataNodeAddress,
     IPAddress,
     IP-value,
     X25Address

        FROM HI2Operations
        {itu-t(0) identified-organization(4) etsi(0) securityDomain(2)
             lawfulIntercept(2) hi2(1) version5(5)}; -- Imported from TS 101 671


-- Object Identifier Definitions

-- Security DomainId
lawfulInterceptDomainId OBJECT IDENTIFIER ::= {itu-t(0) identified-organization(4) etsi(0)
securityDomain(2) lawfulIntercept(2)}

-- Security Subdomains
threeGPPSUBDomainId OBJECT IDENTIFIER ::= {lawfulInterceptDomainId threeGPP(4)}
hi2DomainId OBJECT IDENTIFIER ::= {threeGPPSUBDomainId hi2(1) r6(6) version-6(6)}

umts-sending-of-IRI  OPERATION ::=
{
   ARGUMENT UmtsIRIsContent
   ERRORS      { OperationErrors }
   CODE     global:{threeGPPSUBDomainId hi2(1) opcode(1)}
}
-- Class 2 operation . The timer shall be set to a value between 3 s and 240 s.
-- The timer.default value is 60s.
-- NOTE: The same note as for HI management operation applies.

UmtsIRIsContent        ::= CHOICE
{
   umtsiRIContent         UmtsIRIContent,
   umtsIRISequence        UmtsIRISequence
}

UmtsIRISequence        ::= SEQUENCE OF UmtsIRIContent

-- Aggregation of UmtsIRIContent is an optional feature.
-- It may be applied in cases when at a given point in time
-- several IRI records are available for delivery to the same LEA destination.
-- As a general rule, records created at any event shall be sent
-- immediately and not withheld in the DF or MF in order to
-- apply aggragation.
-- When aggregation is not to be applied,
-- UmtsIRIContent needs to be chosen.
```

```
UmtsIRIContent     ::= CHOICE
{
   iRI-Begin-record     [1] IRI-Parameters,  -- include at least one optional parameter
   iRI-End-record       [2] IRI-Parameters,
   iRI-Continue-record     [3] IRI-Parameters,  -- include at least one optional parameter
   iRI-Report-record    [4] IRI-Parameters   -- include at least one optional parameter
}

unknown-version       ERROR ::= { CODE local:0}
missing-parameter     ERROR ::= { CODE local:1}
unknown-parameter-value ERROR ::= { CODE local:2}
unknown-parameter     ERROR ::= { CODE local:3}

OperationErrors ERROR ::=
{
   unknown-version |
   missing-parameter |
   unknown-parameter-value |
   unknown-parameter
}
-- This values may be sent by the LEMF, when an operation or a parameter is misunderstood.

-- Parameters having the same tag numbers must be identical in Rel-5 and Rel-6 modules.
IRI-Parameters     ::= SEQUENCE
{
   hi2DomainId          [0]  OBJECT IDENTIFIER,  -- 3GPP HI2 domain
   iRIversion           [23] ENUMERATED
   {
      version2 (2),
      …,
      version3 (3),
      version4 (4),
         -- note that version5 (5) cannot be used as it was missed in the version 5 of this
         -- ASN.1 module.
      version6 (6)
   } OPTIONAL,
      -- if not present, it means version 1 is handled
   lawfulInterceptionIdentifier  [1] LawfulInterceptionIdentifier,
      -- This identifier is associated to the target.
   timeStamp            [3] TimeStamp,
      -- date and time of the event triggering the report.)
   initiator            [4] ENUMERATED
   {
      not-Available    (0),
      originating-Target  (1),
         -- in case of GPRS, this indicates that the PDP context activation, modification
         -- or deactivation is MS requested
      terminating-Target  (2),
         -- in case of GPRS, this indicates that the PDP context activation, modification or
         -- deactivation is network initiated
   ...
   } OPTIONAL,

   locationOfTheTarget     [8] Location OPTIONAL,
      -- location of the target subscriber
   partyInformation     [9] SET SIZE (1..10) OF PartyInformation OPTIONAL,
      -- This parameter provides the concerned party, the identiy(ies) of the party
      --)and all the information provided by the party.

   serviceCenterAddress [13] PartyInformation OPTIONAL,
      -- e.g. in case of SMS message this parameter provides the address of  the relevant
      -- server within the calling (if server is originating) or called (if server is
      -- terminating) party address parameters
   sMS          [14] SMS-report OPTIONAL,
      -- this parameter provides the SMS content and associated information

   national-Parameters     [16] National-Parameters OPTIONAL,
   gPRSCorrelationNumber     [18] GPRSCorrelationNumber OPTIONAL,
   gPRSevent        [20] GPRSEvent OPTIONAL,
      -- This information is used to provide particular action of the target
      -- such as attach/detach
   sgsnAddress       [21] DataNodeAddress OPTIONAL,
   gPRSOperationErrorCode  [22] GPRSOperationErrorCode OPTIONAL,
```

```
   ggsnAddress           [24] DataNodeAddress OPTIONAL,
   qOS             [25] UmtsQos OPTIONAL,
   networkIdentifier     [26] Network-Identifier OPTIONAL,
   sMSOriginatingAddress      [27] DataNodeAddress OPTIONAL,
   sMSTerminatingAddress      [28] DataNodeAddress OPTIONAL,
   iMSevent        [29] IMSevent OPTIONAL,
   sIPMessage         [30] OCTET STRING  OPTIONAL,
   servingSGSN-number      [31] OCTET STRING (SIZE (1..20)) OPTIONAL,
                          -- Coded according to 3GPP TS 29.002 [4] and 3GPP TS 23.003 [25].
   servingSGSN-address    [32] OCTET STRING (SIZE (5..17))    OPTIONAL,
              -- Octets are coded according to 3GPP TS 23.003 [25]
   ...,
   national-HI2-ASN1parameters   [255] National-HI2-ASN1parameters   OPTIONAL
}
-- Parameters having the same tag numbers must be identical in Rel-5 and Rel-6 modules

-- PARAMETERS FORMATS

PartyInformation        ::= SEQUENCE
{
   party-Qualifier   [0]  ENUMERATED
   {
      gPRS-Target(3),
      ...
   },
   partyIdentity     [1] SEQUENCE
   {
      imei            [1] OCTET STRING (SIZE (8)) OPTIONAL,
         -- See MAP format [4]

      imsi            [3] OCTET STRING (SIZE (3..8)) OPTIONAL,
         -- See MAP format [4] International Mobile
         -- Station Identity E.212 number beginning with Mobile Country Code

      msISDN          [6] OCTET STRING (SIZE (1..9)) OPTIONAL,
         -- MSISDN of the target, encoded in the same format as the AddressString
         -- parameters defined in MAP format document [4], § 14.7.8

      e164-Format     [7] OCTET STRING    (SIZE (1 .. 25)) OPTIONAL,
         -- E164 address of the node in international format. Coded in the same format as
         -- the calling party number  parameter of the ISUP (parameter part:[5|29])

      sip-uri         [8] OCTET STRING  OPTIONAL,
         -- See [26]


      ...,
      tel-url         [9] OCTET STRING  OPTIONAL
         -- See [36]
   },

   services-Data-Information  [4] Services-Data-Information OPTIONAL,
      -- This parameter is used to transmit all the information concerning the
      -- complementary information associated to the basic data call
   ...
}

Location ::= SEQUENCE
{
   globalCellID      [2] GlobalCellID  OPTIONAL,
      --see MAP format (see [4])
   rAI             [4] Rai     OPTIONAL,
      -- the Routeing Area Identifier is coded in accordance with the § 10.5.5.15 of
      -- document [9] without the Routing Area Identification IEI (only the
      -- last 6 octets are used)
   gsmLocation        [5] GSMLocation OPTIONAL,
   umtsLocation       [6] UMTSLocation OPTIONAL,
   sAI             [7] Sai  OPTIONAL,
      -- format:  PLMN-ID  3 octets (no. 1 – 3)
      --          LAC     2 octets (no. 4 – 5)
      --          SAC     2 octets (no. 6 – 7)
      --          (according to 3GPP TS 25.413)
   ...
}
```

```
GlobalCellID   ::= OCTET STRING  (SIZE (5..7))
Rai            ::= OCTET STRING (SIZE (6))
Sai            ::=  OCTET STRING (SIZE (7))


GSMLocation    ::= CHOICE
{
   geoCoordinates    [1] SEQUENCE
   {
      latitude   [1]   PrintableString (SIZE(7..10)),
                    -- format :    XDDMMSS.SS
      longitude     [2]   PrintableString (SIZE(8..11)),
                    -- format :    XDDDMMSS.SS
      mapDatum   [3]  MapDatum DEFAULT wGS84,
      ...,
      azimuth       [4] INTEGER (0..359) OPTIONAL
         -- The azimuth is the bearing, relative to true north.
   },
      -- format :    XDDDMMSS.SS
      --          X      : N(orth), S(outh), E(ast), W(est)
      --       DD or DDD   : degrees (numeric characters)
      --       MM      : minutes (numeric characters)
      --       SS.SS      : seconds, the second part (.SS) is optionnal
      -- Example :
      --       latitude short form     N502312
      --       longitude long form     E1122312.18

   utmCoordinates [2] SEQUENCE
   {
      utm-East      [1] PrintableString (SIZE(10)),
      utm-North     [2] PrintableString (SIZE(7)),
         -- example  utm-East 32U0439955
         --       utm-North   5540736
      mapDatum   [3]  MapDatum DEFAULT wGS84,
      ...,
      azimuth       [4] INTEGER (0..359) OPTIONAL
         -- The azimuth is the bearing, relative to true north.
   },

   utmRefCoordinates    [3] SEQUENCE
   {
      utmref-string     PrintableString (SIZE(13)),
      mapDatum       MapDatum DEFAULT wGS84,
      ...
   },
      -- example  32UPU91294045

   wGS84Coordinates    [4] OCTET STRING
      -- format is as defined in [37]; polygon type of shape is not allowed.
}

MapDatum ::= ENUMERATED
{
   wGS84,
   wGS72,
   eD50,     -- European Datum 50
   ...
}

UMTSLocation ::= CHOICE {
   point             [1]  GA-Point,
   pointWithUnCertainty [2]   GA-PointWithUnCertainty,
   polygon           [3]   GA-Polygon
}

GeographicalCoordinates ::= SEQUENCE {
   latitudeSign       ENUMERATED { north, south },
   latitude          INTEGER (0..8388607),
   longitude          INTEGER (-8388608..8388607),
   ...
}

GA-Point ::= SEQUENCE {
   geographicalCoordinates    GeographicalCoordinates,
   ...
```

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```
}

GA-PointWithUnCertainty ::=SEQUENCE {
   geographicalCoordinates    GeographicalCoordinates,
   uncertaintyCode            INTEGER (0..127)
}

maxNrOfPoints                 INTEGER ::= 15

GA-Polygon ::= SEQUENCE (SIZE (1..maxNrOfPoints)) OF
   SEQUENCE {
      geographicalCoordinates   GeographicalCoordinates,
      ...
   }

SMS-report     ::= SEQUENCE
{
   sMS-Contents   [3] SEQUENCE
   {
      sms-initiator     [1] ENUMERATED    -- party which sent the  SMS
      {
         target         (0),
         server         (1),
         undefined-party  (2),
         ...
      },
      transfer-status     [2] ENUMERATED
      {
         succeed-transfer (0),     -- the transfer of the SMS message succeeds
         not-succeed-transfer(1),
         undefined       (2),
         ...
      } OPTIONAL,
      other-message     [3] ENUMERATED    -- in case of terminating call, indicates if
                              -- the server will send other SMS
      {
         yes        (0),
         no       (1),
         undefined  (2),
         ...
      } OPTIONAL,
      content           [4] OCTET STRING (SIZE (1 .. 270)) OPTIONAL,
                           -- Encoded in the format defined for the SMS mobile
      ...
   }
}

GPRSCorrelationNumber ::= OCTET STRING (SIZE(8..20))

GPRSEvent ::= ENUMERATED
{
   pDPContextActivation                (1),
   startOfInterceptionWithPDPContextActive   (2),
   pDPContextDeactivation              (4),
   gPRSAttach                  (5),
   gPRSDetach                  (6),
   locationInfoUpdate              (10),
   sMS                (11),
   pDPContextModification          (13),
   servingSystem               (14),
   ...

}
-- see [19]

IMSevent ::= ENUMERATED
{
   unfilteredSIPmessage (1),
      -- This value indicates to LEMF that the whole SIP message is sent.

   ...,
   sIPheaderOnly (2)
      -- If warrant requires only IRI then specific content in a 'sIPMessage'
      -- (e.g. 'Message', etc.) has been deleted before sending it to LEMF.
```

```
}

Services-Data-Information ::= SEQUENCE
{
    gPRS-parameters [1] GPRS-parameters OPTIONAL,
    ...
}

GPRS-parameters ::= SEQUENCE
{
    pDP-address-allocated-to-the-target    [1] DataNodeAddress OPTIONAL,
    aPN                 [2] OCTET STRING (SIZE(1..100)) OPTIONAL,
    pDP-type            [3] OCTET STRING (SIZE(2)) OPTIONAL,
    -- Include either Octets 3 and 4 of the Packet Data Protocol Address information element of
    -- 3GPP TS 24.008 [9] or Octets 4 and 5 of the End User Address IE of 3GPP TS 29.060 [17].
    ...
}

GPRSOperationErrorCode ::= OCTET STRING
-- The parameter shall carry the GMM cause value or the SM cause value, as defined in the
-- standard [9], without the IEI.


UmtsQos ::= CHOICE
{
    qosMobileRadio [1] OCTET STRING,
        -- The qosMobileRadio parameter shall be coded in accordance with the § 10.5.6.5 of
        -- document [9] without the Quality of service IEI and Length of
        -- quality of service IE (. That is, first
        -- two octets carrying 'Quality of service IEI' and 'Length of quality of service
        -- IE' shall be excluded).
    qosGn [2] OCTET STRING
        -- qosGn parameter shall be coded in accordance with § 7.7.34 of document [17]
}

END -- OF UmtsHI2Operations
```

[Clause B.3 Modification End]

Annex A: ASN.1
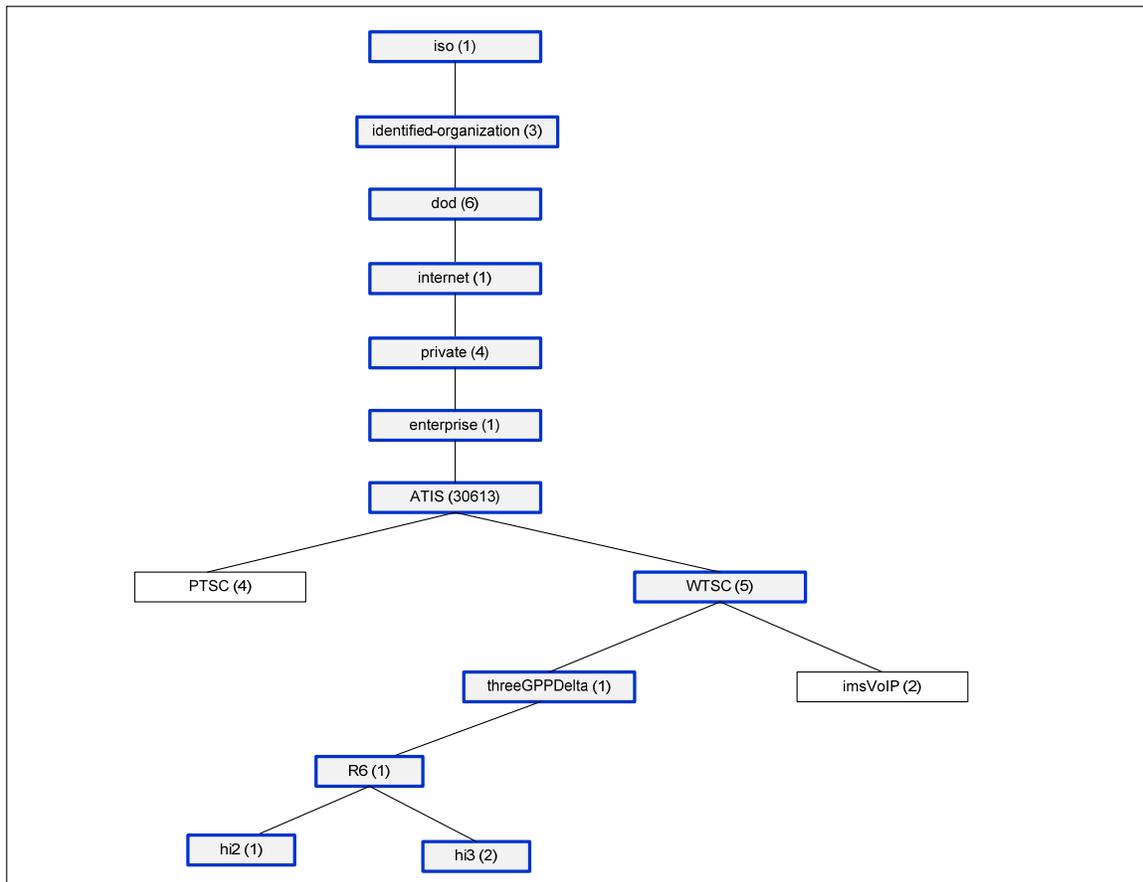
A.1 Object Tree Model

Figure 1. Object Tree Model

A.2 Merged ASN.1

Use the following objects to replace the 3GPP HI2 and HI3 objects in North American implementations. This annex incorporates the three sets of changes described in the body of this document. Since it is meant for machine consumption, change marks are not shown in this Annex as they are in the body of the document. For detailed change marks, see the respective sections in the body of the document. There are no values defined for the National-Parameters type.

```
UmtsHI2OperationsDelta {iso(1) identified-organization(3) dod(6) internet(1) private(4) enterprise(1)
ATIS(30613) WTSC(5) threeGPPDelta(1) r6(6) hi2(1) Version 1(1)}


DEFINITIONS IMPLICIT TAGS ::=


BEGIN


IMPORTS


      OPERATION,
      ERROR
         FROM Remote-Operations-Information-Objects
         {joint-iso-itu-t(2) remote-operations(4) informationObjects(5) version1(0)}

      LawfulInterceptionIdentifier,
      TimeStamp,
      Network-Identifier,
      National-Parameters,
      National-HI2-ASN1parameters,
      DataNodeAddress,
      IPAddress,
      IP-value,
      X25Address

         FROM HI2Operations
         {itu-t(0) identified-organization(4) etsi(0) securityDomain(2)
             lawfulIntercept(2) hi2(1) version5(5)}; -- Imported from TS 101 671


-- Object Identifier Definitions

-- Security DomainId
lawfulInterceptDomainId  OBJECT  IDENTIFIER  ::=  {iso(1)  identified-organization(3)  dod(6)  internet(1)
private(4) enterprise(1) ATIS(30613) WTSC(5) threeGPPDelta(1) r6(6) lawfulIntercept(1)}

-- Security Subdomains
threeGPPdeltaSUBDomainId OBJECT IDENTIFIER ::= {lawfulInterceptDomainId securitySubdomain(1)}
hi2DomainId OBJECT IDENTIFIER ::= {threeGPPdeltaSUBDomainId hi2(1) version-1(1)}

umts-sending-of-IRI  OPERATION ::=
{
   ARGUMENT UmtsIRIsContent
   ERRORS      { OperationErrors }
   CODE     global:{threeGPPSUBDomainId hi2(1) opcode(1)}
}
-- Class 2 operation . The timer shall be set to a value between 3 s and 240 s.
-- The timer.default value is 60s.
-- NOTE: The same note as for HI management operation applies.

UmtsIRIsContent        ::= CHOICE
{
   umtsiRIContent        UmtsIRIContent,
   umtsIRISequence       UmtsIRISequence
}

UmtsIRISequence        ::= SEQUENCE OF UmtsIRIContent


-- Aggregation of UmtsIRIContent is an optional feature.
-- It may be applied in cases when at a given point in time
-- several IRI records are available for delivery to the same LEA destination.
-- As a general rule, records created at any event shall be sent
-- immediately and not withheld in the DF or MF in order to
-- apply aggragation.
-- When aggregation is not to be applied,
```

```
-- UmtsIRIContent needs to be chosen.


UmtsIRIContent      ::= CHOICE
{
    iRI-Begin-record     [1] IRI-Parameters,  -- include at least one optional parameter
    iRI-End-record       [2] IRI-Parameters,
    iRI-Continue-record  [3] IRI-Parameters,  -- include at least one optional parameter
    iRI-Report-record    [4] IRI-Parameters   -- include at least one optional parameter
}


unknown-version         ERROR ::= { CODE local:0}
missing-parameter       ERROR ::= { CODE local:1}
unknown-parameter-value ERROR ::= { CODE local:2}
unknown-parameter       ERROR ::= { CODE local:3}


OperationErrors ERROR ::=
{
    unknown-version |
    missing-parameter |
    unknown-parameter-value |
    unknown-parameter
}
-- This values may be sent by the LEMF, when an operation or a parameter is misunderstood.


-- Parameters having the same tag numbers must be identical in Rel-5 and Rel-6 modules.
IRI-Parameters      ::= SEQUENCE
{
    hi2DomainId         [0]   OBJECT IDENTIFIER,  -- 3GPP HI2 domain
    iRIversion          [23] ENUMERATED
    {
        version2 (2),
        ...,
        version3 (3),
        version4 (4),
            -- note that version5 (5) cannot be used as it was missed in the version 5 of this
            -- ASN.1 module.
        version6 (6)
    } OPTIONAL,
        -- if not present, it means version 1 is handled
    lawfulInterceptionIdentifier  [1] LawfulInterceptionIdentifier,
        -- This identifier is associated to the target.
    timeStamp           [3] TimeStamp,
        -- date and time of the event triggering the report.)
    initiator           [4] ENUMERATED
    {
        not-Available      (0),
        originating-Target (1),
            -- in case of GPRS, this indicates that the PDP context activation, modification
            -- or deactivation is MS requested
        terminating-Target (2),
            -- in case of GPRS, this indicates that the PDP context activation, modification or
            -- deactivation is network initiated
    ...
    } OPTIONAL,

    locationOfTheTarget     [8] Location OPTIONAL,
        -- location of the target subscriber
    partyInformation         [9] SET SIZE (1..10) OF PartyInformation OPTIONAL,
        -- This parameter provides the concerned party, the identiy(ies) of the party
        --)and all the information provided by the party.

    serviceCenterAddress    [13] PartyInformation OPTIONAL,
        -- e.g. in case of SMS message this parameter provides the address of  the relevant
        -- server within the calling (if server is originating) or called (if server is
        -- terminating) party address parameters
    sMS                     [14] SMS-report OPTIONAL,
        -- this parameter provides the SMS content and associated information

    national-Parameters     [16] National-Parameters OPTIONAL,
    gPRSCorrelationNumber   [18] GPRSCorrelationNumber OPTIONAL,
    gPRSevent               [20] GPRSEvent OPTIONAL,
        -- This information is used to provide particular action of the target
        -- such as attach/detach
    sgsnAddress             [21] DataNodeAddress OPTIONAL,
```

```
    gPRSOperationErrorCode  [22] GPRSOperationErrorCode OPTIONAL,
    ggsnAddress             [24] DataNodeAddress OPTIONAL,
    qOS                     [25] UmtsQos OPTIONAL,
    networkIdentifier       [26] Network-Identifier OPTIONAL,
    sMSOriginatingAddress   [27] DataNodeAddress OPTIONAL,
    sMSTerminatingAddress   [28] DataNodeAddress OPTIONAL,
    iMSevent                [29] IMSevent OPTIONAL,
    sIPMessage              [30] OCTET STRING  OPTIONAL,
    servingSGSN-number      [31] OCTET STRING (SIZE (1..20)) OPTIONAL,
                -- Coded according to 3GPP TS 29.002 [4] and 3GPP TS 23.003 [25].
    servingSGSN-address     [32] OCTET STRING (SIZE (5..17))   OPTIONAL,
                -- Octets are coded according to 3GPP TS 23.003 [25]
    ...,
    packetDataHeaderInformation   [43] PacketDataHeaderInformation OPTIONAL,
    national-HI2-ASN1parameters   [255] National-HI2-ASN1parameters   OPTIONAL
}
-- Parameters having the same tag numbers must be identical in Rel-5 and Rel-6 modules


-- PARAMETERS FORMATS

PartyInformation        ::= SEQUENCE
{
    party-Qualifier   [0]  ENUMERATED
    {
       gPRS-Target(3),
       ...
    },
    partyIdentity     [1] SEQUENCE
    {
       imei               [1] OCTET STRING (SIZE (8)) OPTIONAL,
          -- See MAP format [4]

       imsi               [3] OCTET STRING (SIZE (3..8)) OPTIONAL,
          -- See MAP format [4] International Mobile
          -- Station Identity E.212 number beginning with Mobile Country Code

       msISDN             [6] OCTET STRING (SIZE (1..9)) OPTIONAL,
          -- MSISDN of the target, encoded in the same format as the AddressString
          -- parameters defined in MAP format document [4], § 14.7.8

       e164-Format        [7] OCTET STRING   (SIZE (1 .. 25)) OPTIONAL,
          -- E164 address of the node in international format. Coded in the same format as
          -- the calling party number  parameter of the ISUP (parameter part:[5])

       sip-uri            [8] OCTET STRING  OPTIONAL,
          -- See [26]

       ...,
       tel-url            [9] OCTET STRING  OPTIONAL
          -- See [36]
    },

    services-Data-Information  [4] Services-Data-Information OPTIONAL,
       -- This parameter is used to transmit all the information concerning the
       -- complementary information associated to the basic data call
    ...
}

Location ::= SEQUENCE
{
    globalCellID     [2] GlobalCellID  OPTIONAL,
       --see MAP format (see [4])
    rAI              [4] Rai      OPTIONAL,
       -- the Routeing Area Identifier is coded in accordance with the § 10.5.5.15 of
       -- document [9] without the Routing Area Identification IEI (only the
       -- last 6 octets are used)
    gsmLocation      [5] GSMLocation OPTIONAL,
    umtsLocation     [6] UMTSLocation OPTIONAL,
    sAI              [7] Sai  OPTIONAL,
       -- format: PLMN-ID  3 octets (no. 1 – 3)
       --         LAC      2 octets (no. 4 – 5)
       --         SAC      2 octets (no. 6 – 7)
       --         (according to 3GPP TS 25.413)
```

```
   ...
}

GlobalCellID   ::= OCTET STRING  (SIZE (5..7))
Rai            ::= OCTET STRING (SIZE (6))
Sai            ::=   OCTET STRING (SIZE (7))

GSMLocation    ::= CHOICE
{
   geoCoordinates    [1] SEQUENCE
   {
      latitude    [1]   PrintableString (SIZE(7..10)),
                     -- format :    XDDMMSS.SS
      longitude   [2]   PrintableString (SIZE(8..11)),
                     -- format :    XDDDMMSS.SS
      mapDatum    [3]   MapDatum DEFAULT wGS84,
      ...,
      azimuth     [4] INTEGER (0..359) OPTIONAL
         -- The azimuth is the bearing, relative to true north.
   },
      -- format :    XDDDMMSS.SS
      --             X        : N(orth), S(outh), E(ast), W(est)
      --          DD or DDD   : degrees (numeric characters)
      --          MM       : minutes (numeric characters)
      --          SS.SS       : seconds, the second part (.SS) is optionnal
      -- Example :
      --       latitude short form     N502312
      --       longitude long form     E1122312.18

   utmCoordinates [2] SEQUENCE
   {
      utm-East       [1] PrintableString (SIZE(10)),
      utm-North      [2] PrintableString (SIZE(7)),
         -- example  utm-East 32U0439955
         --       utm-North   5540736
      mapDatum    [3]   MapDatum DEFAULT wGS84,
      ...,
      azimuth        [4] INTEGER (0..359) OPTIONAL
         -- The azimuth is the bearing, relative to true north.
   },

   utmRefCoordinates    [3] SEQUENCE
   {
      utmref-string     PrintableString (SIZE(13)),
      mapDatum       MapDatum DEFAULT wGS84,
      ...
   },
      -- example  32UPU91294045

   wGS84Coordinates     [4] OCTET STRING
      -- format is as defined in [37]; polygon type of shape is not allowed.
}

MapDatum ::= ENUMERATED
{
   wGS84,
   wGS72,
   eD50,    -- European Datum 50
   ...
}

UMTSLocation ::= CHOICE {
   point                [1]   GA-Point,
   pointWithUnCertainty [2]   GA-PointWithUnCertainty,
   polygon              [3]   GA-Polygon
}

GeographicalCoordinates ::= SEQUENCE {
   latitudeSign         ENUMERATED { north, south },
   latitude             INTEGER (0..8388607),
   longitude            INTEGER (-8388608..8388607),
   ...
}
```

```
GA-Point ::= SEQUENCE {
   geographicalCoordinates    GeographicalCoordinates,
   ...
}

GA-PointWithUnCertainty ::=SEQUENCE {
   geographicalCoordinates    GeographicalCoordinates,
   uncertaintyCode            INTEGER (0..127)
}

maxNrOfPoints                  INTEGER ::= 15

GA-Polygon ::= SEQUENCE (SIZE (1..maxNrOfPoints)) OF
   SEQUENCE {
      geographicalCoordinates    GeographicalCoordinates,
      ...
   }

SMS-report     ::= SEQUENCE
{
   sMS-Contents   [3] SEQUENCE
   {
      sms-initiator    [1] ENUMERATED    -- party which sent the  SMS
      {
         target           (0),
         server           (1),
         undefined-party  (2),
         ...
      },
      transfer-status    [2] ENUMERATED
      {
         succeed-transfer    (0),     -- the transfer of the SMS message succeeds
         not-succeed-transfer (1),
         undefined           (2),
         ...
      } OPTIONAL,
      other-message    [3] ENUMERATED    -- in case of terminating call, indicates if
                               -- the server will send other SMS
      {
         yes        (0),
         no         (1),
         undefined  (2),
         ...
      } OPTIONAL,
      content            [4] OCTET STRING (SIZE (1 .. 270)) OPTIONAL,
                            -- Encoded in the format defined for the SMS mobile
      ...
   }
}

GPRSCorrelationNumber ::= OCTET STRING (SIZE(8..20))

GPRSEvent ::= ENUMERATED
{
   pDPContextActivation                        (1),
   startOfInterceptionWithPDPContextActive     (2),
   pDPContextDeactivation                      (4),
   gPRSAttach                                  (5),
   gPRSDetach                                  (6),
   locationInfoUpdate                          (10),
   sMS                                         (11),
   pDPContextModification                      (13),
   servingSystem                               (14),
   startOfInterceptionWithMSAttached           (15),
   packetDataHeaderInformation                 (16),
   ...
}
-- see [19]

IMSevent ::= ENUMERATED
{
   unfilteredSIPmessage (1),
      -- This value indicates to LEMF that the whole SIP message is sent.
   ...,
```

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```
    sIPheaderOnly (2)
       -- If warrant requires only IRI then specific content in a 'sIPMessage'
       -- (e.g. 'Message', etc.) has been deleted before sending it to LEMF.
}


Services-Data-Information ::= SEQUENCE
{
    gPRS-parameters [1] GPRS-parameters OPTIONAL,
    ...
}

GPRS-parameters ::= SEQUENCE
{
    pDP-address-allocated-to-the-target    [1] DataNodeAddress OPTIONAL,
    aPN                                     [2] OCTET STRING (SIZE(1..100)) OPTIONAL,
    pDP-type                                [3] OCTET STRING (SIZE(2)) OPTIONAL,
    -- Include either Octets 3 and 4 of the Packet Data Protocol Address information element of
    -- 3GPP TS 24.008 [9] or Octets 4 and 5 of the End User Address IE of 3GPP TS 29.060 [17].
...
}

GPRSOperationErrorCode ::= OCTET STRING
-- The parameter shall carry the GMM cause value or the SM cause value, as defined in the
-- standard [9], without the IEI.


UmtsQos ::= CHOICE
{
    qosMobileRadio [1] OCTET STRING,
       -- The qosMobileRadio parameter shall be coded in accordance with the § 10.5.6.5 of
       -- document [9] without the Quality of service IEI and Length of
       -- quality of service IE (. That is, first
       -- two octets carrying 'Quality of service IEI' and 'Length of quality of service
       -- IE' shall be excluded).
    qosGn           [2] OCTET STRING
       -- qosGn parameter shall be coded in accordance with § 7.7.34 of document [17]
}

PacketDataHeaderInformation ::= CHOICE
{
    packetDataHeader       [1]   PacketDataHeader,
    packetDataSummary [2]   PacketDataSummary,
...
}

PacketDataHeader ::= CHOICE
{

    packetDataHeaderMapped  [1]   PacketDataHeaderMapped,
    packetDataHeaderCopy    [2]   PacketDataHeaderCopy,
...
}

PacketDataHeaderMapped ::= SEQUENCE
{
    sourceIPAddress          [1] IPAddress,
    sourcePortNumber         [2] INTEGER (0..65535) OPTIONAL,
    destinationIPAddress     [3] IPAddress,
    destinationPortNumber    [4] INTEGER (0..65535) OPTIONAL,
    transportProtocol        [5] INTEGER,
    -- For IPv4, report the "Protocol" field and for IPv6 report "Next Header" field.
    -- Assigned Internet Protocol Numbers can be found at
    -- http://www.iana.org/assignments/protocol-numbers/protocol-numbers.xml
    packetsize               [6] INTEGER OPTIONAL,
    flowLabel                [7] INTEGER OPTIONAL,

    direction                [9] TPDU-direction,
...
}


TPDU-direction ::= ENUMERATED
{
    from-target      (1),
    to-target        (2),
```

```
   unknown         (3)
}


PacketDataHeaderCopy ::= SEQUENCE
{
   direction       [1] TPDU-direction,
   headerCopy      [2] OCTET STRING, -- includes a copy of the packet header at the IP
           -- network layer and above including extension headers, but excluding contents.
...
}


PacketDataHeaderSummary ::= SEQUENCE OF PacketFlowSummary

PacketFlowSummary ::= SEQUENCE
{
   sourceIPAddress       [1] IPAddress,
   sourcePortNumber      [2] INTEGER (0..65535) OPTIONAL,
   destinationIPAddress  [3] IPAddress,
   destinationPortNumber [4] INTEGER (0..65535) OPTIONAL,
   transportProtocol     [5] INTEGER,
   -- For IPv4, report the "Protocol" field and for IPv6 report "Next Header" field.
   -- Assigned Internet Protocol Numbers can be found at
   -- http://www.iana.org/assignments/protocol-numbers/protocol-numbers.xml
   flowLabel             [6] INTEGER OPTIONAL,
   summaryPeriod         [7] ReportInterval,
   packetCount           [8] INTEGER,
   sumOfPacketSizes      [9] INTEGER OPTIONAL,
   packetDataSummaryReason [10] ReportReason,
   ...
}


ReportReason ::= ENUMERATED
{
   timerExpired          (0),
   countThresholdHit     (1),
   pDPComtextDeactivated  (2),
   pDPContextModification (3),
   otherOrUnknown        (4),
   ...
}


ReportInterval ::= SEQUENCE
{
   firstPacketTimeStamp [0] TimeStamp,
   lastPacketTimeStamp  [1] TimeStamp,
   ...
}


END -- OF UmtsHI2OperationsDelta




UmtsHI3OperationsDelta {iso(1) identified-organization(3) dod(6) internet(1) private(4) enterprise(1)
ATIS(30613) WTSC(5) threeGPPDelta(1) r6(6) hi3(2) Version 1(1)}


DEFINITIONS IMPLICIT TAGS ::=

BEGIN

IMPORTS

GPRSCorrelationNumber
   FROM UmtsHI2Operations
   {itu-t(0)   identified-organization(4)   etsi(0)   securityDomain(2)   lawfulintercept(2)   threeGPP(4)
   hi2(1) r7(7) version-2(2)}   -- Imported from TS 33.108v7.2.0

LawfulInterceptionIdentifier,

TimeStamp
   FROM HI2Operations
   {itu-t(0)   identified-organization(4)   etsi(0)   securityDomain(2)   lawfulIntercept(2)   hi2(1)
   version9(9)}; -- from ETSI HI2Operations TS 101 671v2.13.1
```

```
-- Object Identifier Definitions


-- Security DomainId
lawfulInterceptDomainId OBJECT IDENTIFIER ::= {iso(1) identified-organization(3) dod(6) internet(1)
private(4) enterprise(1) ATIS(30613) WTSC(5) threeGPPDelta(1) r6(6) lawfulIntercept(1)}


-- Security Subdomains
threeGPPdeltaSUBDomainId OBJECT IDENTIFIER ::= {lawfulInterceptDomainId securitySubdomain(1)}
hi3DomainId OBJECT IDENTIFIER ::= {threeGPPdeltaSUBDomainId hi3(2) version-1(1)}




CC-PDU   ::= SEQUENCE
{
   uLIC-header    [1] ULIC-header,
   payload        [2] OCTET STRING
}

ULIC-header ::= SEQUENCE
{
   hi3DomainId          [0]  OBJECT IDENTIFIER,  -- 3GPP HI3 Domain
   version              [1]  Version,
   lIID              [2] LawfulInterceptionIdentifier OPTIONAL,
   correlation-Number      [3]  GPRSCorrelationNumber,
   timeStamp            [4]  TimeStamp OPTIONAL,
   sequence-number         [5]   INTEGER (0..65535),
   t-PDU-direction         [6] TPDU-direction,
   ...,
   national-HI3-ASN1parameters     [7] National-HI3-ASN1parameters OPTIONAL,
   --  encoded per national requirements
   ice-type          [8] ICE-type OPTIONAL
      -- The ICE-type indicates the applicable Intercepting Control Element(see ref [19]) in which
      -- the T-PDU is intercepted.
}


Version ::= ENUMERATED
{
   version1(1),
   ...,
   version3(3) ,
      -- versions 4-7 were omitted to align with UmtsHI2Operations.
   lastVersion(8)
      -- Mandatory parameter "version" (tag 1) was always redundant in 33.108, because
      -- the object identifier "hi3DomainId" was introduced into "ULIC-headerV in the initial
      -- version of 33.108v5.0.0 In order to keep backward compatibility, even when the
      -- version of the "hi3DomainId" parameter will be incremented it is recommended to
      -- always send to LEMF the same: enumeration value "lastVersion(8)".
}


TPDU-direction ::= ENUMERATED
{
   from-target    (1),
   to-target      (2),
   unknown     (3)
}

National-HI3-ASN1parameters   ::= SEQUENCE
{
   countryCode    [1] PrintableString (SIZE (2)),
      -- Country Code according to ISO 3166-1 [39],
      -- the country to which the parameters inserted after the extension marker apply
   ...
      -- In case a given country wants to use additional national parameters according to its law,
      -- these national parameters should be defined using the ASN.1 syntax and added after the
      -- extension marker (...).
      -- It is recommended that "version parameter" and "vendor identification parameter" are
      -- included in the national parameters definition. Vendor identifications can be
      -- retrieved from IANA web site. It is recommended to avoid
      -- using tags from 240 to 255 in a formal type definition.
}
```

```
ICE-type ::= ENUMERATED
{
   sgsn          (1),
   ggsn          (2),
   ...
}

END-- OF UmtsHI3OperationsDelta
```