Annex 1 to the Ordinance of the Federal Department of Justice and Police (FDJP) of 15 November 2017 on the conduct of the Surveillance of Post and Telecommunications (VD-ÜPF; SR 780.117)

Technical requirements for the handover interfaces for the conduct of the Surveillance of Telecommunications

Version 4.0

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1 Scope of application

The present document is the Annex 1 to the ordinance of the FDJP of 15 November 2017 on the conduct of the surveillance of post and telecommunications (VD-ÜPF).

It describes the technical requirements and options for the handover interfaces between the equipment of the Communication Service Providers (CSPs) and the equipment of the Post and Telecommunications Surveillance Service (PTSS) for the provision of information requests, real-time interception, historical data (retroactive interception), emergency search and tracing. It specifies how the respective ETSI technical specifications apply to the different administrative and technical handover interfaces in Switzerland.

Some of the administrative and technical handover interfaces are not standardised by ETSI and are therefore specified in a proprietary manner in this document.

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2 Abbreviations

3GPP	Third Generation Partnership Project
5GC	5G Core Network
5GS	5G System
5G-GUTI	5G Globally Unique Temporary Identifier
5G-S-TMSI	5G S-Temporary Mobile Subscription Identifier
AAnF	AKMA Anchor Function
AF	Application Function
AKMA	Authentication and Key Management for Application
AMF	Access and Mobility Management Function
ASCII	American National Standard Code for Information Interchange
ASN.1	Abstract Syntax Notation One
BA	Basic Access (ISDN Basic Access)
BBIFF	Bearer Binding Intercept and Forward Function
BC	Bearer Capability
BRAS	Broadband Remote Access Server
BSSID	Basic Service Set Identifier
BÜPF	“Bundesgesetz vom 18. März 2016 betreffend die Überwachung des Post- und Fernmeldeverkehrs (BÜPF, SR 780.1)” - Federal Act of 18 March 2016 on the Surveillance of Post and Telecommunications
CC	Content of Communication
CD	Call Data
CDR	Charging Data Record
CGI	Cell Global Identification
CLIP/R	Calling Line Identification Presentation / Restriction
CMTS	Cable Modem Termination System
COLP/R	Connected Line Identification Presentation / Restriction
CPE	Customer-Premises Equipment
CS	Circuit-switch
CSP	Communications Service Provider
CUG	Closed User Group
CUPS	Control and User Plane Separation
DCF77	German longwave time signal and standard-frequency radio station.
DDI	Direct Dialling In
DN	Data Network
DNN	Data Network Name
DSG	“Bundesgesetz vom 25. September 2020 über den Datenschutz (DSG, SR 235.1)” – Federal Act of 25 September 2020 on Data Protection (FADP)
DSS1	Digital Subscriber Signalling System No 1
DTD	Document Type Definition
E.164	International public telecommunication numbering plan defined by ITU-T
ECGI	E-UTRAN Cell Global Identification
eCNAM	Enhanced Calling Name
EES	Edge Enabler Server
EJPD	Eidgenössisches Justiz- und Polizeidepartement (see FDJP)
EN-DC	E-UTRA – NR Dual Connectivity
EPS	Evolved Packet System
ETSI	European Telecommunications Standards Institute
EUI	Extended unique identifier
E-UTRAN	Evolved Universal Terrestrial Radio Access Network
FDJP	Federal Department of Justice and Police
FOITT	Federal Office of Information Technology, Systems and Telecommunication
FTP	File Transfer Protocol

GERAN	GSM EDGE Radio Access Network
GPRS	General Packet Radio Service
GPSI	Generic Public Subscription Identifier
GSM	Global System for Mobile Communications
GSMA	GSM Association
GUAMI	Globally Unique AMF Identifier
HI	Handover Interface
HLC	High Layer Compatibility
HPLMN	Home Public Land Mobile Network
HR	Home Routing
HTTP	HyperText Transfer Protocol
HTTPS	HyperText Transfer Protocol over Secure Socket Layer
IANA	Internet Assigned Numbers Authority
ICF	Identifier Caching Function
IEF	Identifier Event Function
IETF	Internet Engineering Task Force
IIF	Internal Interception Function
IQF	Identifier Query Function
IMAP	Internet Message Access Protocol
IMEI	International Mobile station Equipment Identity
IMEISV	International Mobile station Equipment Identity with Software Version
IMSI	International Mobile Subscriber Identity
INI	Internal Network Interface
IP	Internet Protocol
IRI	Interception Related Information
ISC-FDJP	IT Service Centre Federal Department of Justice and Police
ISDN	Integrated Services Digital Network
ISO	International Organization for Standardization
ITU-T	International Telecommunication Union - Telecommunication Standardisation Sector
LALS	Lawful Access Location Services
LAN	Local Area Network
LBO	Local Break-Out
LD	Lawful Disclosure
LEA	Law Enforcement Agency
LEMF	Law Enforcement Monitoring Facility
LI	Lawful Interception
LI_HIQR	Lawful Interception Handover Interface Query Response
LICF	Lawful Interception Control Function
LIPF	Lawful Interception Provisioning Function
LIID	Lawful Interception Identifier
LMISF	LI Mirror IMS State Function
MAP	Mobile Application Part
MCPTT	Mission Critical Push-To-Talk
MDF	Mediation and Delivery Function
MMS	Multimedia Messaging Service
MS	Mobile Station
MSC	Mobile Switching Centre
MSISDN	Mobile Subscriber ISDN Number
MSN	Multiple Subscriber Number
MTA	Mail Transfer Agent
N3IWF	Non 3GPP Inter Working Function
N9HR	N9 Home Routing
NAI	Network Access Identifier

NAS	Non-Access Stratum
NCGI	NR Cell Global Identity
NCI	NR Cell Identity
NEF	Network Exposure Function
NEID	Network Element Identifier
NF	Network Function
NGAP	NG Application Protocol
NID	Network Identity
NIDD	Non-IP Data Delivery
NPLI	Network Provided Location Information
NR	New Radio
NRF	Network Repository Function
NWDAF	Network Data Analytics Function
OFCOM	Federal Office of Communications (Switzerland)
OID	Object Identifier
OMA	Open Mobile Alliance
PCF	Policy Control Function
PCRF	Policy and Charging Rules Function
PDN-GW	Packet Data Network Gateway
PEI	Permanent Equipment Identifier
PLMN	Public Land Mobile Network
POI	Point Of Interception
POP3	Post Office Protocol – Version 3
PRA	Primary Rate Access
PRS	Premium Rate Services
PSTN	Public Switched Telephone Network
PTC	Push-To-Talk over Cellular
PTSS	Postal and Telecommunications Surveillance Service
PUK	Personal Unblocking Key
RAI	Routing Area Identity
RCD	Rich Call Data
RCS	Rich Communication Suite
S1AP	S1 Application Protocol
S8HR	S8 Home Routing
S-GW	Serving Gateway
SAI	Service Area Identity
SCEF	Service Capabilities Exposure Function
SDP	Session Description Protocol
SHAKEN	Secure Handling of Asserted information using toKENs
SIP	Session Initiation Protocol
SIM	Subscriber Identity Module
SIRF	System Information Retrieval Function
SMF	Session Management Function
SMS	Short Message Service
SMSF	SMS Function
SMTP	Simple Mail Transfer Protocol
SN	Subscriber Number
SR	Classified Compilation of Federal Legislation
STIR	Secure Telephony Identity Revisited
SUCI	Subscription Concealed Identifier
SUPI	Subscription Permanent Identifier
TAI	Tracking Area Identity
TCE-O	Telecommunications equipment belonging to the person obliged to cooperate (e.g. the CSP)

TCP	Transport Control Protocol
TDM	Time Division Multiplexing
TF	Triggering Function
TMSI	Temporary Mobile Subscriber Identity
TNGF	Trusted Non-3GPP Gateway Function
TWIF	Trusted WLAN Interworking Function
UDM	Unified Data Management
UDP	User Datagram Protocol
UE	User Equipment
UMS	Unified Messaging System
UMTS	Universal Mobile Telecommunications System
UPF	User Plane Function
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
UTF-8	8-bit Unicode Transformation Format (IETF RFC 3629, ISO 10646)
UTRAN	Universal Terrestrial Radio Access Network
UUID	Universally Unique Identifier
UUS	User-to-User Signalling
VD-ÜPF	”Verordnung des EJPD über die Durchführung der Überwachung des Post- und Fernmeldeverkehrs vom 15. November 2017 (SR 780.117)” - Ordinance of the FDJP of 15 November 2017 on the Conduct of the Surveillance of Post and Telecommunications
VMS	Voicemail Service
VoIP	Voice over IP
VPLMN	Visited Public Land Mobile Network
VPN	Virtual Private Network
VÜPF	”Verordnung über die Überwachung des Post- und Fernmeldeverkehrs vom 15. November 2017 (VÜPF, SR 780.11)“ - Ordinance of 15 November 2017 on the Surveillance of Post and Telecommunications
WGS	World Geodetic System
WLAN	Wireless Local Area Network
xCC	LI_X3 Communications Content
xDSL	Digital subscriber line (x stands for various types)
xIRI	LI_X2 Intercept Related Information
XML	Extensible Markup Language
XSD	XML Schema Definition

3 Definitions

Communication service provider (CSP)
The CSP is intended as the legal entity providing telecommunication services, including network operators, access providers and service providers. Where appropriate, the requirements and options in this document concerning the CSP are applicable by analogy to the providers of derived communication services with extended obligations.

Handover interface (HI)
Physical and logical interface across which the information requests and the interception measures are requested from a CSP, and the results of information requests and the results of interception are delivered from a CSP to a law enforcement monitoring facility (processing system of the PTSS).

Historical Data (retroactive interception)
Retained data associated with telecommunication services involving the target identity, specifically communication associated information or data (including unsuccessful communication attempts), service associated information or data (e.g., service profile management by subscriber) and location information.

Interception Related Information (IRI)
Set of information or data associated with telecommunication services involving the target identity, specifically communication associated information or data (including unsuccessful communication attempts), service associated information or data (e.g., service profile management by subscriber) and location information.

Content of Communication (CC)
Information exchanged between two or more users of a telecommunication service, excluding Interception Related Information.

Law Enforcement Monitoring Facility (LEMF)
The processing system (*Verarbeitungssystem*) which is designated as the transmission destination for the results of information requests and the results of interception relating to a particular interception subject. PTSS operates the LEMF in Switzerland.

Mediation Function (MF)
Mechanism which passes information between a CSP and a Handover Interface, and information between the Internal Network Interface and the Handover Interface.

Target identity
Technical identity (e.g. the interception's subject directory number), which uniquely identifies a target of interception. One target may have one or several target identities.

Delivery network (DN)
Network infrastructure between the CSP and the LEMF used to transmit the results of information requests and the results of interception. It can support different types of lower communication layers, which should be standard or widely used data communication protocols.

4 Administrative Handover Interfaces

This section covers the requirements related to the different administrative handover interfaces carrying the instructions for real-time interceptions, retroactive interceptions (aka historical data or retained data) and information requests orders as well as the different notifications and operational information exchanges between PTSS and the CSP.

4.1 General

The following table enumerates the different types of interception instructions and information requests to be exchanged between the PTSS and the CSP and indicates which administrative handover interface can be used.

VÜPF articles	**Type of instruction and data exchanged between PTSS and CSP**	**1st Administrative HI**	**2nd Administrative HI**	**3rd Administrative HI**
27, 35 to 48, 48a,48c	Information requests Abbr.: IRTask	HI-A according to ETSI TS 102 657 V2.6.1 Annex 1 Section 4.2.4	Secure Email Annex 1 Section 4.3.3.2	Telephone Annex 1 Section 4.4
48b	Information request IR_52_ASSOC_TEMP	Annex 1 Section 8.4.12	Not applicable	Not applicable
54 to 59	Real-time interception instructions Abbr.: LITask	HI-1 according to ETSI TS 103 120 V1.9.1 Annex 1 Section 4.2.2 or 4.2.3	Secure Email Annex 1 Section 4.3.3.1	Telephone Annex 1 Section 4.4
67b,67c, 67d,67e, 68b,68c, 68d,68e	Real-time interception instructions for emergency search and search for convicted persons.	Telephone and HI-1 according to ETSI TS 103 120 V1.9.1 Annex 1 Section 4.4 Section 4.2.2 or 4.2.3	Telephone and Secure Email Annex 1 Section 4.4 Section 4.3.3.1	Telephone Annex 1 Section 4.4
60 to 66, 67a,67f, 68a,68f, 68g	Retroactive (aka historical data or retained data) interception instructions Abbr.: RDTask	HI-A according to ETSI TS 102 657 V2.6.1 Annex 1 Section 4.2.4	Secure Email Annex 1 Section 4.3.3.2	Telephone Annex 1 Section 4.4

Table 4-1: Administrative handover interfaces for interception instructions and information requests

The following table enumerates the different administrative handover interfaces that can be used to exchange general information and notifications between the PTSS and the CSP.

Type of Information	1st Administrative HI	2nd Administrative HI	3rd Administrative HI
General and operational information notifications	Secure Email Annex 1 Section 4.3.4.1	Telephone Annex 1 Section 4.4	Registered post Annex 1 Section 4.5

Table 4-2: Administrative handover interfaces for general information and notifications

4.2 XML over HTTP Exchange

4.2.1 General

The administrative interface using XML over HTTPS may be used to support several administrative processes as mentioned in the tables above in 4.1. The following table enumerates the three interception ordering processes that use HTTPS as a transport method.

Handover interface	Section
HI1 XML over HTTP administrative interface for instructing real-time interceptions (HI-1 eWarrant ETSI TS 103 120 V1.9.1) The description of this administrative interface is used as a reference section but it is not implemented or used by the PTSS and the CSP.	Annex 1 Section 4.2.2
Ad hoc HI1 XML over HTTP administrative interface for instructing real-time interceptions	Annex 1 Section 4.2.3
HI-A XML over HTTP administrative interface for instructing retroactive interceptions “historical data / retained data” (same as for Information Requests) (HI-A ETSI TS 102 657 V2.6.1)	Annex 1 Section 4.2.4

4.2.2 HI-1 XML over HTTP administrative interface for instructing real-time interceptions (HI-1 eWarrant ETSI TS 103 120 V1.9.1)

This whole section 4.2.2 is for reference only. This HI-1 XML over HTTPS administrative interface might be implemented in the future.

HI-1 eWarrant can use the encoding and delivery format XML as described in ETSI TS 103 120 V1.9.1 clause 9.2 and HTTP transport as described in clause 9.3. The requirements and options for this handover interface are detailed in this section.

The overall architecture used between the PTSS and CSP follows the scenario shown in ETSI TS 103 120 V1.9.1 Annex A.3 for a single "Central Authority" (warrant = order).

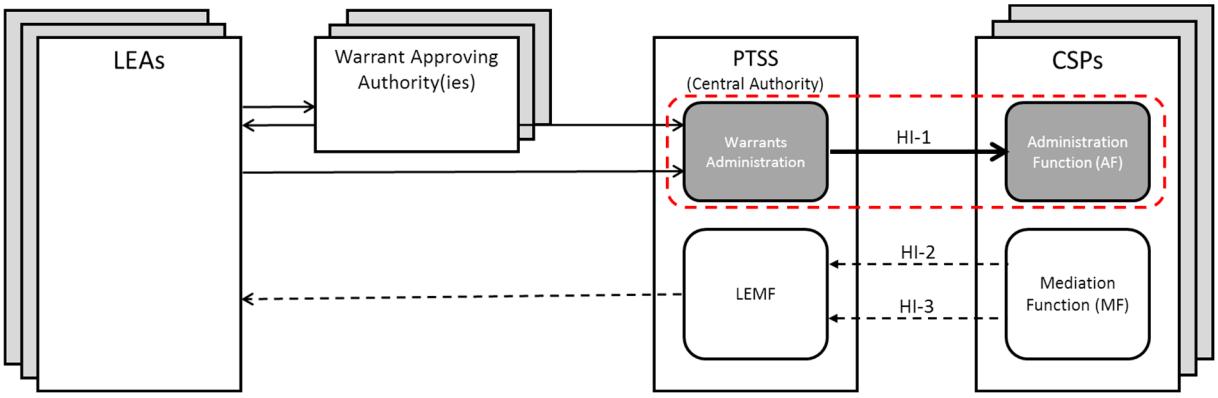

Figure 4-1: HI-1 administrative interface for real-time interception instructions

4.2.2.1 Transport security

Implementations shall support HTTPS as defined in IETF RFC 2818, including the support for mutual authentication through bidirectional certificate usage according to ETSI TS 103 120 V1.9.1 clause 9.3.4.
The exchange of the certificates and security requirements (such as key management, key length and the choice of cryptographic algorithm) is an implementation issue and shall be determined by the PTSS based on consultations with the CSP.

4.2.2.2 Action messages used for the real-time interception instruction process

Action messages defined by the HI-1 interface that are used by task management processes.

Action Requests	Action Responses
Create	CreateResponse
Get	GetResponse
Update	UpdateResponse
List	ListResponse
	Error Information

Table 4-3: Action messages used by the HI-1 interface via HTTP

4.2.2.3 Message flow for a real-time interception activation instruction

This section provides an overview of the message flow for a real-time interception activation instruction.

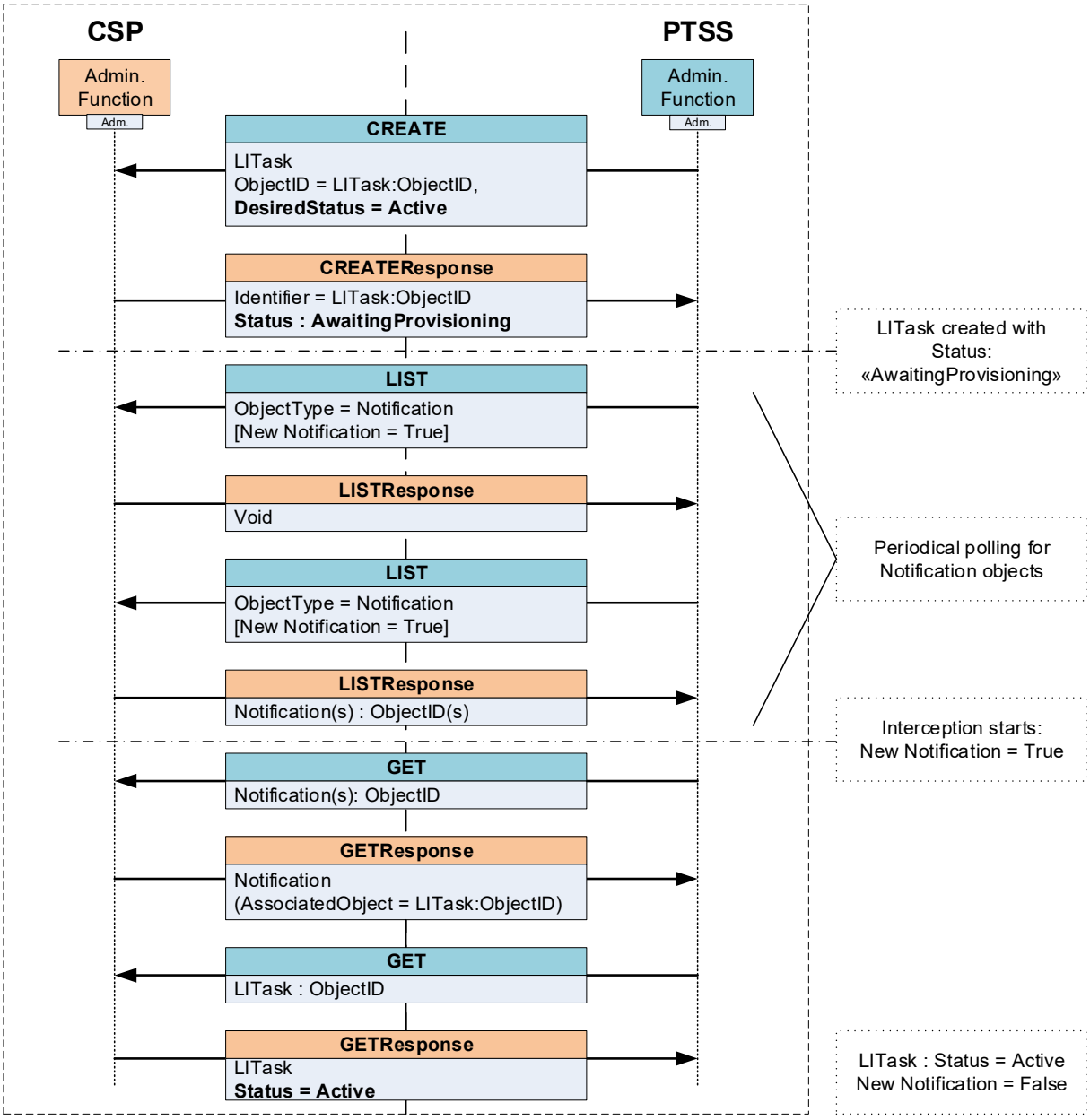

Figure 4-2: Message flow for a real-time interception activation instruction based on HTTP

4.2.2.4 Message flow for a real-time interception deactivation instruction

This section provides an overview of the message flow for a real-time interception deactivation instruction.

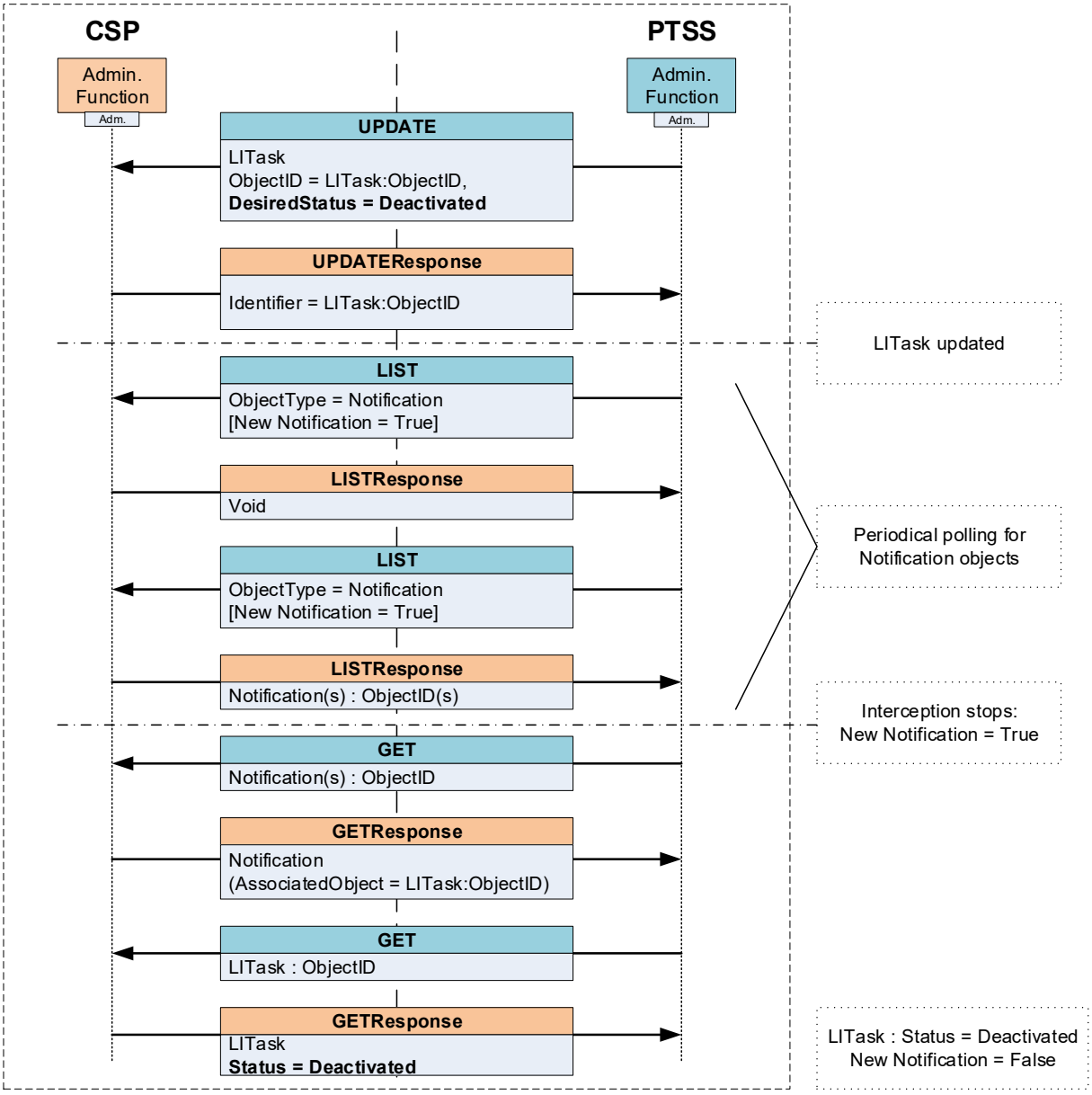

Figure 4-3: Message flow for a real-time interception deactivation instruction based on HTTP

4.2.2.5 Message flow for a real-time interception cancellation instruction

This section provides an overview of the message flow for a real-time interception cancellation instruction.

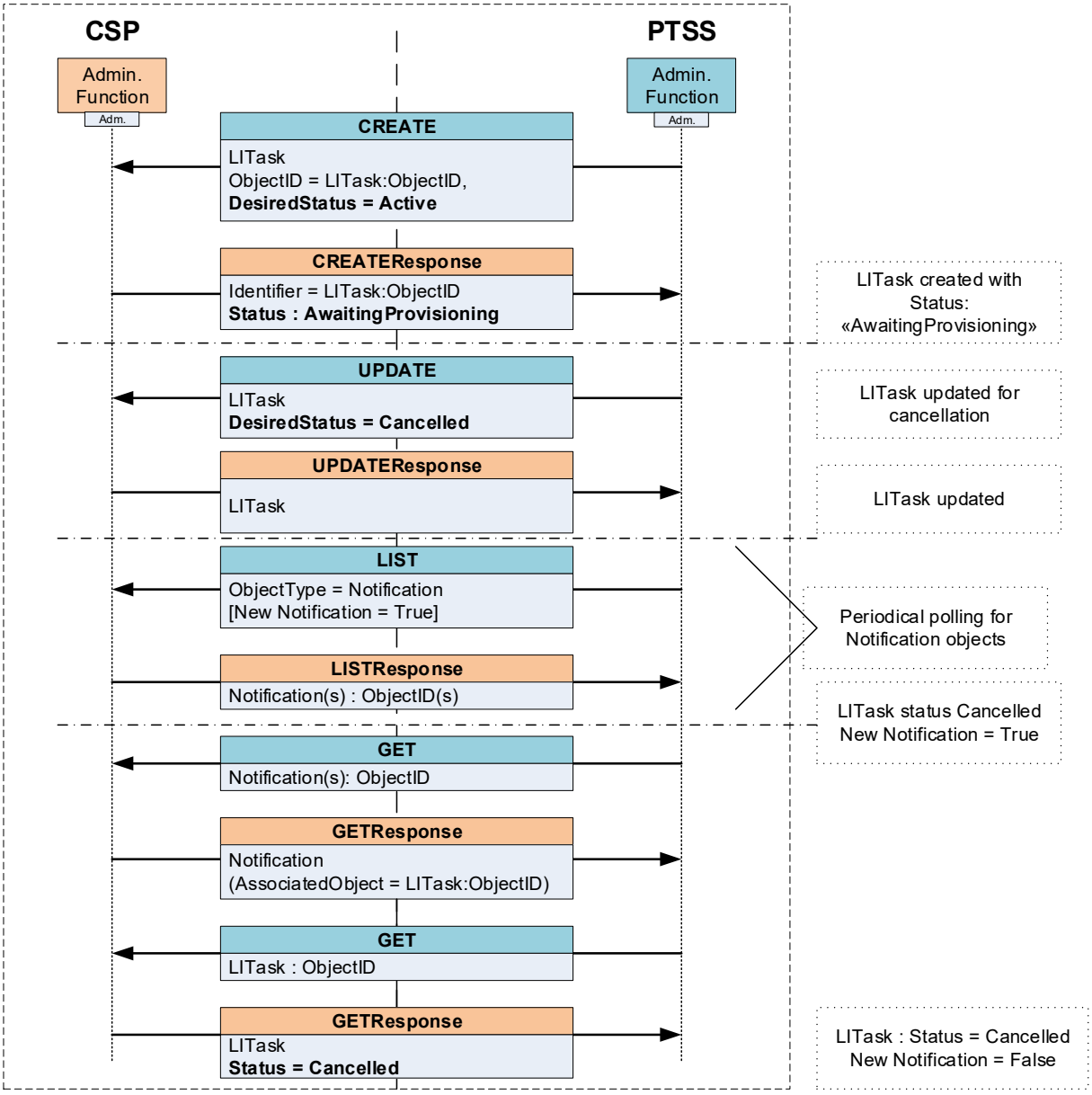

Figure 4-4: Message flow for a real-time interception cancellation instruction based on HTTP

4.2.2.6 Message flow in case of error or invalidity of a real-time interception instruction

This section provides an overview of the message flow in case of error or invalidity of a real-time interception instruction.

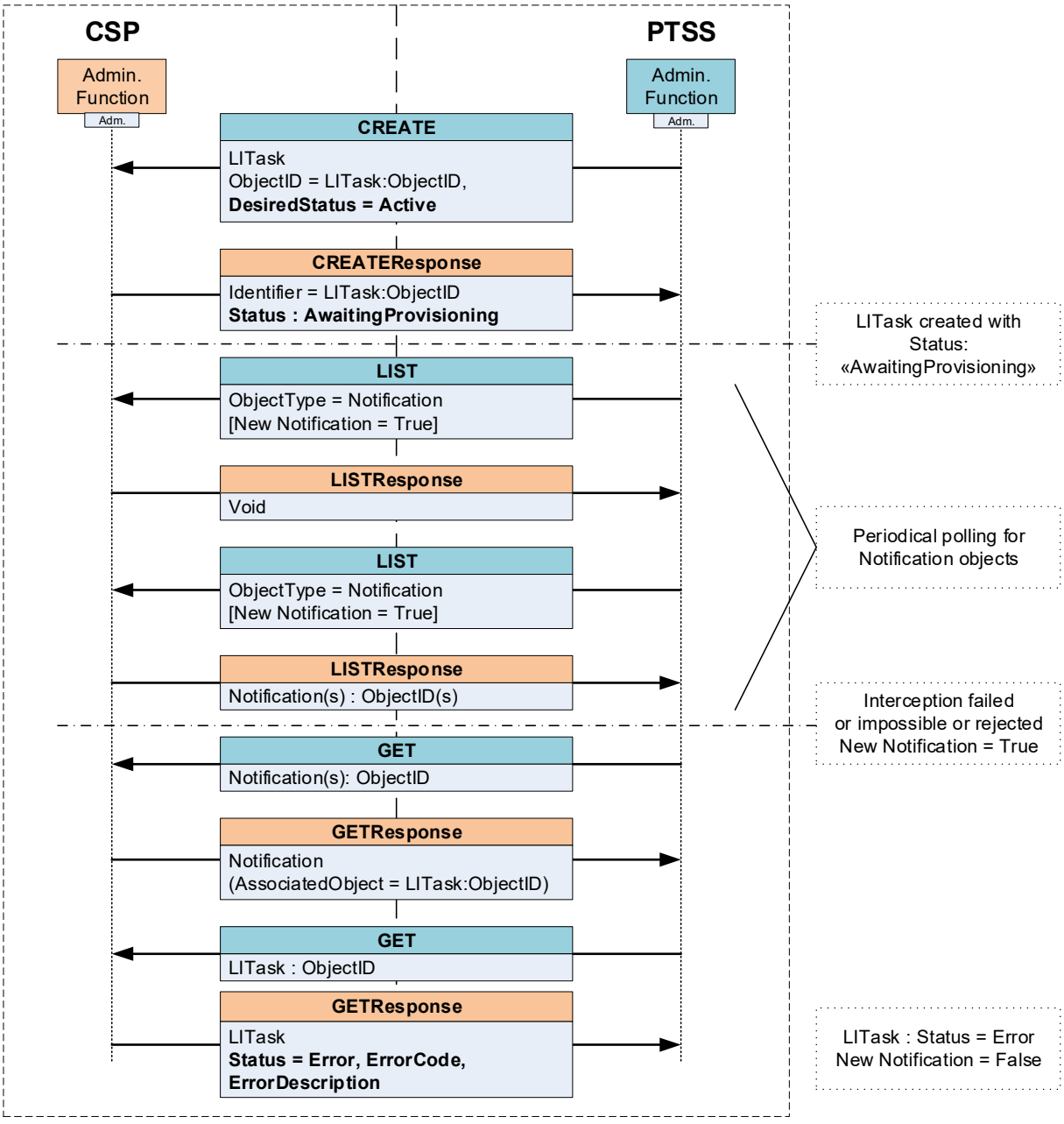

Figure 4-5: Message flow in case of error or invalidity of a real-time interception instruction based on HTTP

4.2.2.7 ETSI TS 103 120 V1.9.1 requirements and options

The table below presents the Swiss national options according to ETSI TS 103 120 V1.9.1 and the real-time interception instructing process.

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
6.2 Messages header		
6.2.3 Version	**NationalProfileOwner:** National profile owner.	PTSS
	NationalProfileVersion: (see ETSI TS 103 280 V2.16.1)	PTSS_DictionaryDefinitions V3.0.0.xml
6.2.4	**UniqueIdentifier:** Unique identifier sufficient for identifying the object/field within the country. LongString (see ETSI TS 103 280 V2.16.1)	PTSS for PTSS and the CSPID for CSPs. CSPID is a 5-digit code allocated by the PTSS to each CSP in Switzerland.
6.4 Action Request and Responses (request payload)		
6.4.5	**GET Response**	List of HI-1 Objects items required in the GET Response Messages: **HI-1 object required fields:** ObjectIdentifier Generation ExternalIdentifier AssociatedObjects LastChanged **Notification object required fields:** NotificationType NewNotification NotificationTimestamp **LITask object required fields:** Reference Status TimeSpan InvalidReason

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
6.4.6	**CREATE Request**	List of the HI-1 Object fields required in the CREATE Request Messages: **HI-1 object required fields:** ObjectIdentifier CountryCode OwnerIdentifier AssociatedObjects **LITask object required fields:** Reference DesiredStatus TimeSpan TargetIdentifier DeliveryDetails CSPID Flags
	CREATE Response	List of the HI-1 Object fields required in the CREATE Response Messages: **HI-1 object required fields:** ObjectIdentifier Generation LastChanged **LITask object required fields:** Reference Status
6.4.7	**UPDATE Request**	List of the HI-1 Object fields required in the UPDATE Request Messages: **HI-1 object required fields:** ObjectIdentifier **LITask object required fields:** Reference DesiredStatus TimeSpan
	UPDATE Response	List of the HI-1 Object fields required in UPDATE Response Messages: **HI-1 object required fields:** ObjectIdentifier Generation LastChanged **LITask object required fields:** Reference

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
6.4.8	**LIST Request (for Notification)**	**Object type** field is **required** and shall be set to “Notification”. As general purpose, **ObjectType** values shall comply with ObjectType Dictionary (ETSI TS 103 120 V1.9.1 clause 6.4.8) **LastChanged** field is not required for Notification related requests.
	LIST Response (for Notification)	Fields required in LIST Response Messages: **Required**: ObjectType Identifier Generation CountryCode OwnerIdentifier LastChanged
6.4.9	**Action Unsuccessful Information**	**ErrorCode** and **ErrorInformation** shall match values of table D.1 “Detailed error codes” of ETSI TS 103 120 V1.9.1 Annex D.
7.1 HI-1 Object		
7.1.1	**ExternalIdentifier**	This field is used to correlate the tasking instructions for accounting purposes. It is composed of the first 14 digits of the LITask:Reference LIID.
7.1.4	**AssociatedObjects**	The field **AssociatedObjects** contains a single **AssociatedObject** that is populated with the *ObjectIdentifier* of the associated LITask or Notification object.
7.4 Notification Object		
7.4.3	**NotificationType** PTSS dictionary reflects specific National PTSS Notification types.	**Dictionary owner:** PTSS **Dictionary Name:** NotificationTypes **Dictionary authorised values:** TaskStatusChanged TaskStatusActive TaskStatusCancelled TaskStatusDeactivated TaskStatusCompleted
8.2 LITask Object		

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
8.2.3	**Status** PTSS dictionary reflects specific National PTSS Status.	**Dictionary owner:** PTSS **Dictionary Name:** TaskStatus **Dictionary authorised values:** ***AwaitingProvisioning***: The Task is approved, but is not yet provisioned in the LI system. ***Active***: The Task is active and can produce LI traffic. ***Cancelled***: The Task has been permanently cancelled ***Error***: The Task is not active due to a problem with the underlying LI system or with the information in the Task Object. ***Deactivated***: The Task has been deactivated by the PTSS

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
8.2.4	**Desired Status** PTSS dictionary reflects specific National PTSS DesiredStatus.	**Dictionary owner:** PTSS **Dictionary Name:** TaskDesiredStatus **Dictionary authorised values:** ***AwaitingProvisioning***: The Task is approved, but is not yet provisioned in the LI system. ***Active***: The Task is active and can produce LI traffic. ***Rejected***: The Task has been explicitly denied or rejected by one or more relevant authorities. ***Cancelled***: The Task has been permanently cancelled. ***Deactivated***: The Task has been deactivated by the PTSS. ***Error***: The Task is not active due to a problem with the underlying LI system or with the information in the Task Object.
8.2.5	**TimeSpan**	**TimeSpan** is split in 5 fields detailed below: **StartTime** is populated by the PTSS in the CREATERequest (Activation) with required interception start date and time. **EndTime** is populated by the PTSS in the UPDATERequest (Deactivation) with required interception stop date and time.
8.2.6	**TargetIdentifier**	**Required fields:** TargetIdentifierValues

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
8.2.8	**DeliveryDetails**	**Required fields:** **IRIorCC**: This structure supports the dictionary entries of the PTSSNationalRequestTypes dictionary. These fields contain references to national LI types taken from the real-time interception type list (see section 6.2) for real-time interception.
8.2.8.2	**DeliveryProfile**	**Dictionary owner:** PTSS **Dictionary Name:** DeliveryProfile **Dictionary authorised values:** Production Integration_1 Integration_2 PMT_Production PMT_Integration_1 PMT_Integration_2 FLICC_Production FLICC_Integration_1 FLICC_Integration_2
8.2.12	**Flags**	**Dictionary owner:** PTSS **Dictionary Name:** FlagsStatus **Dictionary authorised values:** Normal TEST_PTE (NOTE 1) TEST_PTSA (NOTE 1) TEST_PTSE (NOTE 1) TEST_PTSTR (NOTE 1) TEST_PTSTE (NOTE 1) TEST_CTT (NOTE 1) TEST_ATT (NOTE 1)
9.3.2	**Client/Server architecture**	On PTSS side the client uses the following timeout and retries configuration: Connection timeout: 10 seconds Read timeout: 30 seconds Retry policy: every 1 minute, 15 retries Final failure: Alert/requeue for manual processing.

Table 4-4: ETSI TS 103 120 V1.9.1 requirements and options

NOTE 1: Description of the different test types in the instructions:

TEST_PTE:	Permanent Test Environment
TEST_PTSA:	PTSS ad-hoc
TEST_PTSE:	PTSS extended test targets
TEST_PTSTR:	PTSS training targets
TEST_PTSTE:	PTSS pool for authorities
TEST_CTT:	Compliance test target
TEST_ATT:	Authorities' test target

4.2.2.8 Format and coding of real-time interception activation and deactivation.

This section provides requirements and information about the different elements composing XML requests for the real-time interception instructions sent by the PTSS to the CSP and the respective responses.

Example of messages below are extracted from a complete interception activation transaction. The collection of messages below aims to show an example of structure for each kind of message, they do not represent a full transaction.

Action message (Request or Response)
XML header
TransactionIdentifier
Timestamp
XML payload

Create
XML header section 4.2.2.8.1
ee4165be-4817-11e6-beb8-9e71128cae77
2016-07-12T12:10:00.000000Z
XML message payload 4.2.2.8.2

CreateResponse
XML header section 4.2.2.8.1
ee4165be-4817-11e6-beb8-9e71128cae77
2016-07-12T12:10:03.000000Z
XML message payload 4.2.2.8.3

List
XML header section 4.2.2.8.1
b8508613-4320-4043-aa7f-2d0d818bbdb5
2016-07-12T15:00:00.000000Z
XML message payload 4.2.2.8.4

ListResponse
XML header section 4.2.2.8.1
b8508613-4320-4043-aa7f-2d0d818bbdb5
2016-07-12T15:00:10.000000Z
XML message payload 4.2.2.8.5

Get
XML header section 4.2.2.8.1
360d1903-5892-434f-87c1-8d33400fce38
2016-07-13T15:00:20.000000Z
XML message payload 4.2.2.8.6

GetResponse
XML header section 4.2.2.8.1
360d1903-5892-434f-87c1-8d33400fce38
2016-07-13T15:00:30.000000Z
XML message payload 4.2.2.8.7

Update
XML header section 4.2.2.8.1
d8c14821-a4d5-4481-9076-7e3b649c9f66
2016-12-30T12:00:00.000000Z
XML message payload 4.2.2.8.8

UpdateResponse
XML header section 4.2.2.8.1
d8c14821-a4d5-4481-9076-7e3b649c9f66
2016-12-30T12:01:00.000000Z
XML message payload 4.2.2.8.9

Figure 4-6: Format and coding of real-time interception activation and deactivation based on HTTP

4.2.2.8.1 XML of a Request/Response header (real-time interception)

ETSI TS 103 120 V1.9.1 Clause 6.2 Messages header		
Element or attribute	**Description**	**Example**
SenderIdentifier/ CountryCode		
	ISOCountryCode giving 3166-1 alpha-2 code	CH
SenderIdentifier/ UniqueIdentifier		
	LongString	PTSS
ReceiverIdentifier/ CountryCode		
	See SenderIdentifier	CH
ReceiverIdentifier/ UniqueIdentifier		
	See SenderIdentifier	99908
TransactionIdentifier	UUID in IETF RFC 4122 canonical form	ee4165be-4817-11e6-beb8-9e71128cae77
Timestamp	QualifiedMicrosecondDateTime	2016-07-12T12:10:00.000000Z
Version/ ETSIVersion		
	ShortString of the form "VX.Y.Z" (X gives major version, Y gives minor version, Z gives revision.	V1.3.1 or V1.9.1
Version/ NationalProfileOwner		
	National profile owner	PTSS
Version/ NationalProfileVersion		
	ShortString	V3.0.0

Table 4-5: XML of a Request/Response header for real-time interception based on HTTP

4.2.2.8.2 XML of a CREATE request payload (real-time interception).

ETSI TS 103 120 V1.9.1 Clause 6.4		
CREATE request LITask		
Element or attribute	**Description**	**Example**
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
CountryCode	ShortString and ISO 3166-1 Alpha-2 code	CH
OwnerIdentifier	ShortString	PTSS
ExternalIdentifier	LongString	20160921876543

LITask		
Reference	LIID	201609218765432
DesiredStatus/ common:Owner		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	PTSS
DesiredStatus/ common:Name		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	TaskDesiredStatus
DesiredStatus/ common:Value		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	Active
TimeSpan/ StartTime		
	QualifiedDateTime	2016-07-12T12:10:00+02:00
TargetIdentifier/ TargetIdentifierValues/ FormatType/ FormatOwner		
	ShortString	ETSI
TargetIdentifier/ TargetIdentifierValues/ FormatType/ FormatName		
	ShortString	InternationalE164
TargetIdentifier/ TargetIdentifierValues/ Value		
	LongString	41598889988
DeliveryDetails/ DeliveryDestination/ IRIorCC/ common:Owner		
	ShortString	PTSS
DeliveryDetails/ DeliveryDestination/ IRIorCC/ common:Name		
	ShortString	PTSSNationalRequestTypes
DeliveryDetails/ DeliveryDestination/ IRIorCC/ common:Value		
	LongString	RT_23_NA_CC_IRI
DeliveryDetails/ DeliveryDestination/ DeliveryProfile/ common:Owner		
	ShortString	PTSS
DeliveryDetails/ DeliveryDestination/ DeliveryProfile/ common:Name		
	ShortString	DeliveryProfile
DeliveryDetails/ DeliveryDestination/ DeliveryProfile/ common:Value		
	DeliveryProfile dictionary owned by PTSS	Production
CSPID/ CountryCode		
	ReceiverIdentifier	CH
CSPID/ UniqueIdentifier		
	ReceiverIdentifier	99908
Flags/ TaskFlag/ common:Owner		
	FlagStatus dictionary owned by the PTSS. ShortString	PTSS
Flags/ TaskFlag/ common:Name		
	FlagStatus dictionary owned by the PTSS. ShortString	TaskStatus

Flags/ TaskFlag/ common :Value		
	FlagStatus dictionary owned by the PTSS. ShortString	Normal

Table 4-6: XML of a CREATE request payload

4.2.2.8.3 XML of a CREATEResponse payload (real-time interception)

ETSI TS 103 120 V1.9.1 Clause 6.4		
CREATEResponse LITask		
Element or attribute	**Description**	**Example**
Identifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
Generation	Positive integer	1
ExternalIdentifier	LongString	20160921876543
LastChanged	QualifiedDateTime	2016-07-12T12:10:00+02:00
LITask		
Reference	LIID	201609218765432
Status/ common:Owner		
	TaskStatus PTSS proprietary dictionary entry and ShortString	PTSS
Status/ common:Name		
	TaskStatus PTSS proprietary dictionary entry and ShortString	TaskStatus
Status/ common:Value		
	TaskStatus PTSS proprietary dictionary entry and ShortString	AwaitingProvisioning

Table 4-7: XML of a CREATEResponse payload

4.2.2.8.4 XML of a LIST request payload (real-time interception)

ETSI TS 103 120 V1.9.1 Clause 6.4		
LIST request Notification		
Element or attribute	**Description**	**Example**
LIST		
ObjectType/ common:Owner		
	ObjectType Dictionary entry	ETSI
ObjectType/ common:Name		
	ObjectType Dictionary entry	ObjectTypeDictionary
ObjectType/ common:Value		
	ObjectType Dictionary entry	Notification

Table 4-8: XML of a LIST request payload

4.2.2.8.5 XML of a LISTResponse payload (real-time interception)

ETSI TS 103 120 V1.9.1 Clause 6.4		
LISTResponse Notification		
Element or attribute	**Description**	**Example**
LISTResponse		
ObjectType/ common:Owner		
	ObjectType Dictionary entry	ETSI
ObjectType/ common:Name		
	ObjectType Dictionary entry	ObjectTypeDictionary
ObjectType/ common:Value		
	ObjectType Dictionary entry	Notification
Identifier	UUID according to IETF RFC 4122 canonical form	4804bdd0-c4d8-41c3-847a-4b5154864beb
CountryCode	ShortString and ISO 3166-1 Alpha-2 code	CH
OwnerIdentifier	ShortString	99908
Generation	Positive integer	2
LastChanged	QualifiedDateTime	2016-07-12T13:30:00+02:00

Table 4-9: XML of a LISTResponse payload

4.2.2.8.6 XML of a GET request payload (real-time interception)

ETSI TS 103 120 V1.9.1 Clause 6.4		
GET request Notification		
Element or attribute	**Description**	**Example**
GET		
Identifier	UUID according to IETF RFC 4122 canonical form	4804bdd0-c4d8-41c3-847a-4b5154864beb

Table 4-10: XML of a GET request payload

4.2.2.8.7 XML of a GETResponse payload (real-time interception)

ETSI TS 103 120 V1.9.1 Clause 6.4		
GETResponse Notification		
Element or attribute	**Description**	**Example**
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	4804bdd0-c4d8-41c3-847a-4b5154864beb
Generation	Positive integer	3
AssociatedObjects/ AssociatedObject		
	List of ObjectIdentifiers: UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
LastChanged	QualifiedDateTime	2016-07-13T15:00:20+02:00
Notification		
NotificationType/ common:Owner		
	NotificationType PTSS proprietary dictionary entry and ShortString	PTSS
NotificationType/ common:Name		
	NotificationType PTSS proprietary dictionary entry and ShortString	NotificationType
NotificationType/ common:Value		
	NotificationType PTSS proprietary dictionary entry and ShortString	TaskStatusChange
NewNotification	Boolean	True
NotificationTimestamp	QualifiedDateTime	2016-07-12T13:30:00+02:00

Table 4-11: XML of a GETResponse payload

4.2.2.8.8 XML of an UPDATE request payload (real-time interception)

ETSI TS 103 120 V1.9.1 Clause 6.4 Action Request and Responses		
UPDATE request LITask		
Element or attribute	**Description**	**Example**
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
LITask		
Reference	LIID	201609218765432
DesiredStatus/ common:Owner		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	PTSS
DesiredStatus/ common:Name		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	TaskDesiredStatus
DesiredStatus/ common:Value		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	Deactived
TimeSpan/ EndTime		
	QualifiedDateTime	2016-12-31T23:59:59+02:00

Table 4-12: XML of an UPDATE request payload

4.2.2.8.9 XML of an UPDATEResponse payload (real-time interception)

ETSI TS 103 120 V1.9.1 Clause 6.4		
UPDATEResponse LITask		
Element or attribute	**Description**	**Example**
Identifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
Generation	Positive integer	4
LastChanged	QualifiedDateTime	2016-12-30T12:00:00+02:00
LITask		
Reference	LIID	201609218765432

Table 4-13: XML of an UPDATEResponse payload

4.2.2.9 Applicable XML schema version for real-time interception instructions

Any superior version can be adopted from the CSP for better performances. This must be agreed with PTSS in order to ensure the compatibility with the actual HI-1 XML over HTTP administrative interface, and this requires a new compliance assessment.

Applicable XML Schema	Requirement or instruction for application
ETSI TS 103 120 V1.9.1	
XML Schema (xsd)	ts_103120v010301p0_Common.xsd or ts_103120v010901p0_Common.xsd
	ts_103120v010301p0_Core.xsd or ts_103120v010901p0_Core.xsd
	ts_103120v010301p0_Dictionaries.xsd or ts_103120v010901p0_Dictionaries.xsd
	ts_103120v010301p0_Task.xsd or ts_103120v010901p0_Task.xsd
	ts_103120v010301p0_Notification.xsd or ts_103120v010901p0_Notification.xsd
XML file	ts_103120v010301p0_ETSIDictionaryDefinitions.xml or ts_103120v010901p0_ETSIDictionaryDefinitions.xml
	_PTSS_DictionaryDefinitions V3.0.0.xml (NOTE 1)
ETSI TS 103 280 V2.16.1	
XML Schema (xsd)	ts_103280v020301p0.xsd or ts_103280v021301.xsd

Table 4-14: Applicable XML schema version for real-time interception instructions

NOTE 1: The file "_PTSS_DictionaryDefinitions V3.0.0.xml" is issued by PTSS and can be provided upon request to the CSP.

4.2.3 Ad hoc HI-1 XML over HTTP administrative interface for instructing the real-time interceptions

4.2.3.1 Ad hoc HI-1 interface solution overview

The solution detailed in the section below proposes a somewhat simplified process and interface (HI-1) to instruct real-time interceptions in comparison to the comprehensive implementation of the HI-1 eWarrant specified for reference in section 4.2.2. As this ad hoc interface does not use the LIST and GET and Notification messages the consequence is that this ad hoc interface solution provides a more limited control over the instruction process.

This ad hoc interface uses most of the building blocks of the specification ETSI TS 103 120 V1.9.1 such as the LITask objects and the XML messages and the transport network. However, the ad hoc interface requires the CSP to send an UPDATE request to the PTSS and the PTSS to send an UPDATEResponse to the CSP with the following adaptations:

a) In the UPDATE request the CSP shall send a “DesiredStatus” instead of a "Status" to the PTSS as specified in ETSI TS 103 120 V1.9.1 UPDATE request message specification.

b) In the UPDATEResponse the PTSS shall omit the “LastChange” and "Generation" parameters.

4.2.3.2 Ad hoc HI-1 interface transport security

Provisions of the section 4.2.2.1 regarding transport and security remain valid for the exchange on the ad hoc interface (XML messages via HTTPS including the elements referring to ETSI TS 103 120 V1.9.1).

4.2.3.3 Ad hoc HI-1 interface action messages used for a real-time interception instruction process

Action messages defined for the ad hoc interface that are used by the LITask management processes.

Action Requests	Action Responses
Create	CreateResponse
Update	UpdateResponse
	Error Information

Table 4-15: Action messages used by the ad hoc HI-1 interface via HTTP

4.2.3.4 Ad hoc HI-1 interface: Message flow for a real-time interception activation instruction

This section provides an overview of the message flow for an ad hoc real-time interception activation instruction.

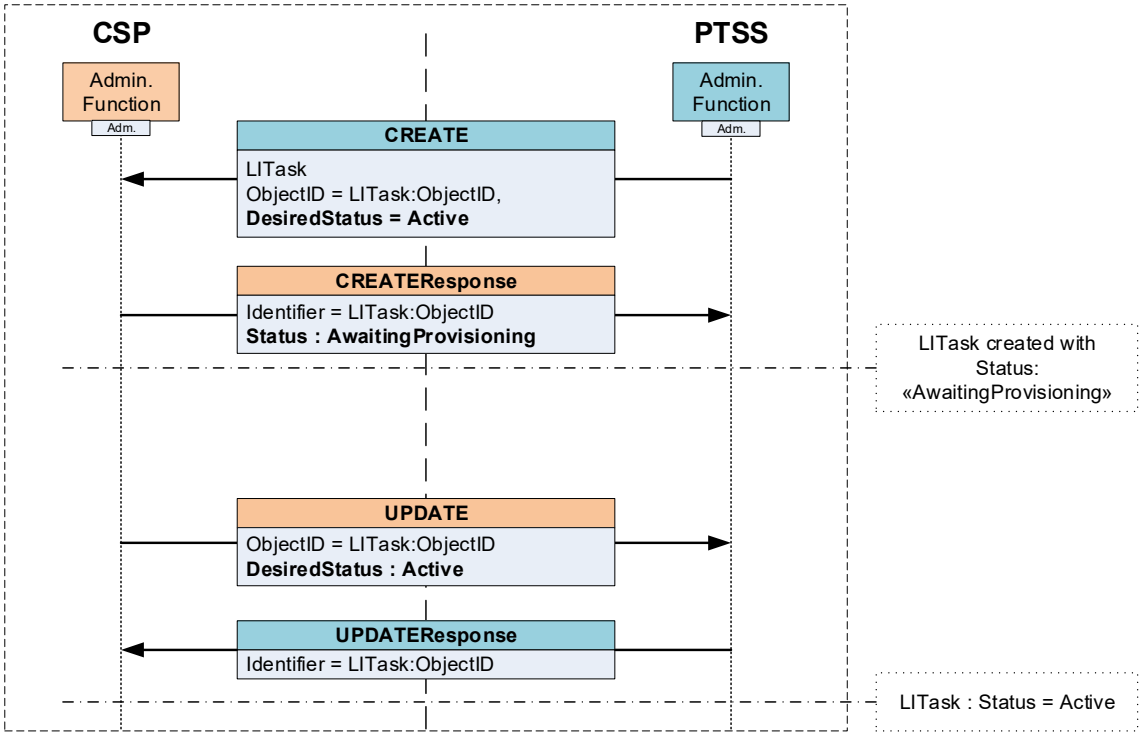

Figure 4-7: Message flow for a real-time interception activation instruction based on ad hoc HI1 interface

4.2.3.5 Ad hoc HI-1 interface: Message flow for a real-time interception deactivation instruction

This section provides an overview of the message flow for an ad hoc real-time interception deactivation instruction.

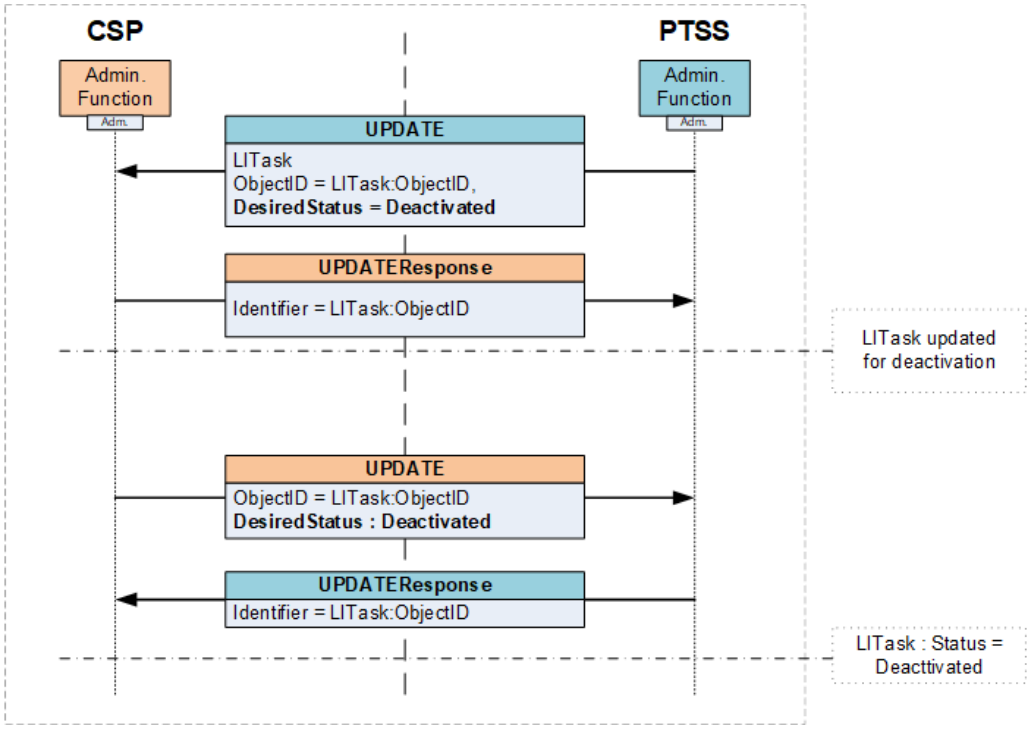

Figure 4-8: Message flow for a real-time interception deactivation instruction based on ad hoc HI1 interface

4.2.3.6 Ad hoc HI-1 interface: Message flow for a real-time interception cancellation instruction

This section provides an overview of the message flow for ad hoc real-time interception cancellation instruction.

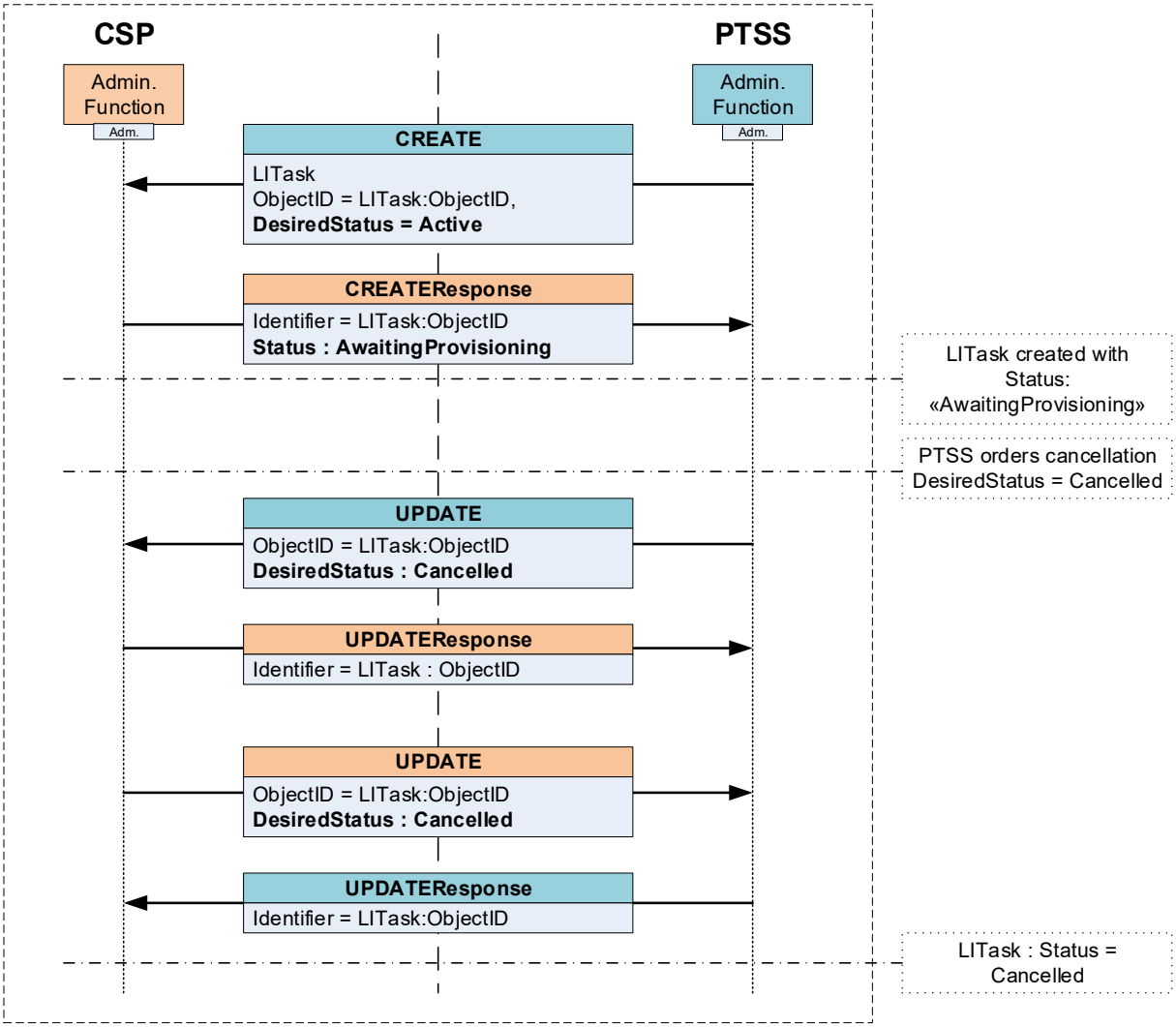

Figure 4-9: Message flow for a real-time interception cancellation instruction based on ad hoc HI1 interface

4.2.3.7 Ad hoc HI-1 interface: Message flow in case of error or invalidity of a real-time interception instruction

This section provides an overview of the message flow in case of error or invalidity of an ad hoc real-time interception instruction.

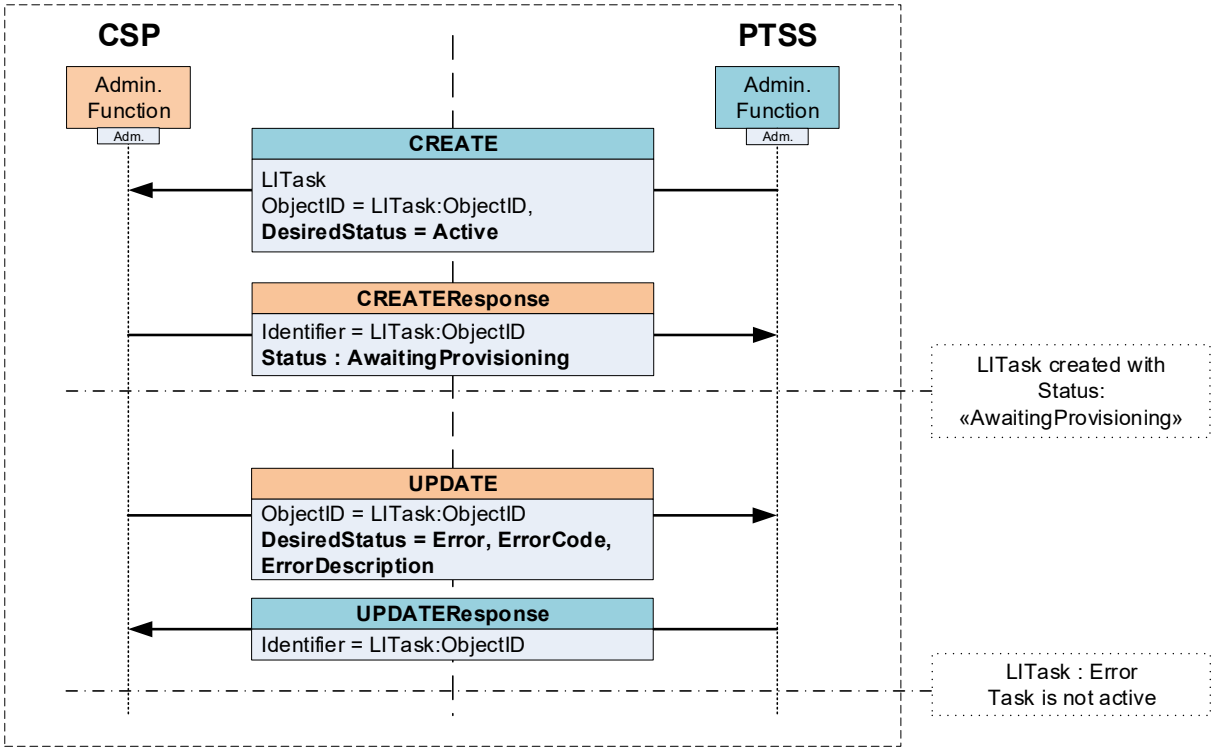

Figure 4-10: Message flow for a real-time interception instruction in case of error or invalidity based on ad hoc HI1 interface

4.2.3.8 Ad hoc HI1 interface: ETSI TS 103 120 V1.9.1 requirements and options

The table below presents the Swiss national options for the implementation of the ad hoc HI1 interface according to ETSI TS 103 120 V1.9.1 and the exchange of simple XML messages via HTTPS process.

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
6.2 Messages header		
6.2.3 Version	**NationalProfileOwner:** National profile owner.	PTSS
	NationalProfileVersion: (see ETSI TS 103 280 V2.6.1)	PTSS_DictionaryDefinitions V3.0.0.xml
6.2.4	**UniqueIdentifier:** Unique identifier sufficient for identifying the object/field within the country. LongString	PTSS for PTSS and the CSPID for CSPs. CSPID is a 5-digit code allocated by the PTSS to each CSP in Switzerland.
6.4 Action Request and Responses (request payload)		
6.4.6	**CREATE request**	List of the HI-1 Object fields required in the CREATE Request Messages: **HI-1 object required fields:** ObjectIdentifier CountryCode OwnerIdentifier **LITask object required fields:** Reference DesiredStatus TimeSpan TargetIdentifier DeliveryDetails CSPID Flags
	CREATEResponse	List of the HI-1 Object fields required in the CREATE Response Messages: **HI-1 object required fields:** ObjectIdentifier Generation LastChanged **LITask object required fields:** Reference Status
6.4.7	**UPDATE request**	List of the HI-1 Object fields required in the UPDATE Request Messages: **HI-1 object required fields:** ObjectIdentifier **LITask object required fields:**

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
		Reference DesiredStatus TimeSpan
	UPDATEResponse	List of the HI-1 Object fields required in UPDATE Response Messages: **HI-1 object required fields:** ObjectIdentifier Generation* LastChanged* **LITask object required fields:** Reference *Only used when the message is sent by the CSP
6.4.9	**Action Unsuccessful Information**	**ErrorCode** and **ErrorInformation** shall match values of table D.1 “Detailed error codes” of ETSI TS 103 120 V1.9.1 Annex D.
7.1 HI-1 Object		
7.1.1	**ExternalIdentifier**	This field is used to correlate the tasking instructions for accounting purposes. It is composed of the first 14 digits of the LITask:Reference LIID.
8.2 LITask Object		
8.2.3	**Status** PTSS dictionary reflects specific National PTSS Status.	**Dictionary owner:** PTSS **Dictionary Name:** TaskStatus **Dictionary authorised values:** ***AwaitingProvisioning***: The Task is approved, but is not yet provisioned in the LI system. ***Active***: The Task is active and can produce LI traffic. ***Cancelled***: The Task has been permanently cancelled. ***Error***: The Task is not active due to a problem with the underlying LI system or with the information in Task Object. ***Deactivated***: The Task has been deactivated by the PTSS.
8.2.4	**Desired Status**	**Dictionary owner:**

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
	PTSS dictionary reflects specific National PTSS DesiredStatus.	PTSS **Dictionary Name:** TaskDesiredStatus **Dictionary authorised values:** ***AwaitingProvisioning***: The Task is approved, but is not yet provisioned in the LI system. ***Active***: The Task is active and can produce LI traffic. ***Rejected***: The Task has been explicitly denied or rejected. ***Cancelled***: The Task has been permanently cancelled ***Deactivated***: The Task has been deactivated by the PTSS. ***Error***: The Task is not active due to a problem with the underlying LI system or with the information in Task Object.
8.2.5	**TimeSpan**	**TimeSpan** is split in 5 fields detailed below: **StartTime** is populated by the PTSS in the CREATERequest (Activation) with required interception start date and time. **EndTime** is populated by the PTSS in the UPDATERequest (Deactivation) with required interception stop date and time.
8.2.6	**TargetIdentifier**	**Required fields:** TargetIdentifierValues
8.2.8	**DeliveryDetails**	**Required fields:** **IRIorCC**: This structure supports the dictionary entries of the PTSSNationalRequestTypes dictionary**.** These fields contain references to national LI types taken from the real-time interception type list (see section 6.2) for real-time interception.
8.2.8.2	**DeliveryProfile**	**Dictionary owner:**

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
		PTSS **Dictionary Name:** DeliveryProfile **Dictionary authorised values:** Production Integration_1 Integration_2 PMT_Production PMT_Integration_1 PMT_Integration_2 FLICC_Production FLICC_Integration_1 FLICC_Integration_2
8.2.12	**Flags**	**Dictionary owner:** PTSS **Dictionary Name:** FlagsStatus **Dictionary authorised values:** Normal TEST_PTE (NOTE 1) TEST_PTSA (NOTE 1) TEST_PTSE (NOTE 1) TEST_PTSTR (NOTE 1) TEST_PTSTE (NOTE 1) TEST_CTT (NOTE 1) TEST_ATT (NOTE 1)

Table 4-16: Ad hoc HI-1 interface ETSI TS 103 120 V1.9.1 requirements and options

NOTE 1: Description of the different test types in the instructions:
TEST_PTE: Permanent Test Environment
TEST_PTSA: PTSS ad-hoc
TEST_PTSE: PTSS extended test targets
TEST_PTSTR: PTSS training targets
TEST_PTSTE: PTSS pool for authorities
TEST_CTT: Compliance test target
TEST_ATT: Authorities' test target

4.2.3.9 Ad hoc HI-1 interface format and coding of real-time interception simple activation and deactivation.

This section provides requirements and information about the different elements composing XML messages for the real-time interception simple process exchanged over the ad hoc HI-1 interface by the PTSS and CSP.

Example of messages below are extracted from a complete interception activation transaction. The collection of messages below aims to show an example of structure for each kind of message. They do not represent a full transaction.

Action message (Request or Response)
XML header
TransactionIdentifier
Timestamp
XML payload

Activation: PTSS➔CSP	Ack.: CSP➔PTSS	Active: CSP➔PTSS	Ack.PTSS➔CSP
Create	CreateResponse	Update*	UpdateResponse*
XML header section 4.2.2.8.1	**XML header section 4.2.2.8.1**	**XML header section 4.2.2.8.1**	**XML header section 4.2.2.8.1**
ee4165be-4817-11e6-beb8-9e71128cae77	ee4165be-4817-11e6-beb8-9e71128cae77	b8508613-4320-4043-aa7f-2d0d818bbdb5	b8508613-4320-4043-aa7f-2d0d818bbdb5
2016-07-12T12:10:00.000000Z	2016-07-12T12:10:03.000000Z	2016-07-13T12:00:00.000000Z	2016-07-13T12:00:10.000000Z
XML message payload 4.2.3.9.1	XML message payload 4.2.3.9.2	XML message payload 4.2.3.9.3	XML message payload 4.2.3.9.4

Deactiv.: PTSS➔CSP	Ack.: CSP➔PTSS	Deactiv.:CSP➔PTSS	Ack.: PTSS➔CSP
Update	UpdateResponse	Update*	UpdateResponse*
XML header section 4.2.2.8.1	**XML header section 4.2.2.8.1**	**XML header section 4.2.2.8.1**	**XML header section 4.2.2.8.1**
d8c14821-a4d5-4481-9076-7e3b649c9f66	d8c14821-a4d5-4481-9076-7e3b649c9f66	3798439e-9e58-42ea-95cc-8fa887dde61a	3798439e-9e58-42ea-95cc-8fa887dde61a
2016-12-30T12:00:00.000000Z	2016-12-31T12:04:00.000000Z	2016-12-31T15:01:00.000000Z	2016-12-31T15:10:00.000000Z
XML message payload 4.2.3.9.5	XML message payload 4.2.3.9.6	XML message payload 4.2.3.9.7	XML message payload 4.2.3.9.8

Figure 4-11: Format and coding of real-time interception activation and deactivation based on HTTP

*Permutation of sender and receiver (PTSS=Receiver and CSP=Sender)

4.2.3.9.1 Ad hoc HI-1 interface XML of a CREATE request payload (real-time interception simple activation)

ETSI TS 103 120 V1.9.1 Clause 6.4		
CREATE request LITask		
Element or attribute	**Description**	**Example**
CREATE		
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
CountryCode	ShortString and ISO 3166-1 Alpha-2 code	CH
OwnerIdentifier	ShortString	PTSS
ExternalIdentifier	LongString	20160921876543
LITask		
Reference	LIID	201609218765432
DesiredStatus/ common:Owner		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	PTSS
DesiredStatus/ common:Name		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	TaskDesiredStatus
DesiredStatus/ common:Value		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	Active
TimeSpan/ StartTime		
	QualifiedDateTime	2016-07-13T12:10:00+02:00
TargetIdentifier/ TargetIdentifierValues/ FormatType/ FormatOwner		
	ShortString	ETSI
TargetIdentifier/ TargetIdentifierValues/ FormatType/ FormatName		
	ShortString	InternationalE164
TargetIdentifier/ TargetIdentifierValues/ Value		
	LongString	41598889988
DeliveryDetails/ DeliveryDestination/ IRIorCC/ common:Owner		

	ShortString	PTSS
DeliveryDetails/ DeliveryDestination/ IRIorCC/ common:Name		
	ShortString	PTSSNationalRequestTypes
DeliveryDetails/ DeliveryDestination/ IRIorCC/ common:Value		
	LongString	RT_23_NA_CC_IRI
DeliveryDetails/ DeliveryDestination/ DeliveryProfile/ common:Owner		
	ShortString	PTSS
DeliveryDetails/ DeliveryDestination/ DeliveryProfile/ common:Name		
	ShortString	DeliveryProfile
DeliveryDetails/ DeliveryDestination/ DeliveryProfile/ common:Value		
	DeliveryProfile dictionary owned by PTSS	Production
CSPID/ CountryCode		
	ReceiverIdentifier	CH
CSPID/ UniqueIdentifier		
	ReceiverIdentifier	99908
Flags/ TaskFlag/ common:Owner		
	FlagStatus dictionary owned by the PTSS. ShortString (see ETSI TS 103 280 V2.16.1).	PTSS
Flags/ TaskFlag/ common:Name		
	FlagStatus dictionary owned by the PTSS. ShortString	FlagStatus
Flags/ TaskFlag/ common :Value		
	FlagStatus dictionary owned by the PTSS. ShortString	Normal

Table 4-17: Ad hoc HI-1 interface XML of a simple CREATE request payload

4.2.3.9.2 Ad hoc HI-1 interface XML of a simple CREATEResponse payload (real-time interception simple activation)

ETSI TS 103 120 V1.9.1 Clause 6.4		
CREATEResponse LITask		
Element or attribute	**Description**	**Example**
CREATEResponse		
Identifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
Generation	Positive integer	1
LastChanged	QualifiedDateTime	2016-07-13T12:10:03+02:00
LITask		
Reference	LIID	201609218765432
Status/ common:Owner		
	TaskStatus PTSS proprietary dictionary entry and ShortString	PTSS
Status/ common:Name		
	TaskStatus PTSS proprietary dictionary entry and ShortString	TaskStatus
Status/ common:Value		
	TaskStatus PTSS proprietary dictionary entry and ShortString	AwaitingProvisioning

Table 4-18: Ad hoc HI-1 interface XML of a CREATEResponse payload (simple interception process)

4.2.3.9.3 Ad hoc HI-1 interface XML of a UPDATE request payload (real-time interception simple activation)

ETSI TS 103 120 V1.9.1 Clause 6.4 Action Request and Responses		
UPDATE request LITask		
Element or attribute	**Description**	**Example**
UPDATE		
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
LITask		
Reference	LIID	201609218765432
DesiredStatus/ common:Owner		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	PTSS
DesiredStatus/ common:Name		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	TaskDesiredStatus
DesiredStatus/ common:Value		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	Active

Table 4-19: Ad hoc HI-1 interface XML of a simple UPDATE request payload (sent by CSP)

4.2.3.9.4 Ad hoc HI-1 interface XML of an UPDATEResponse payload (real-time interception simple activation)

ETSI TS 103 120 V1.9.1 Clause 6.4		
UPDATE Response LITask		
Element or attribute	**Description**	**Example**
UPDATEResponse		
Identifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
LITask		
Reference	LIID	201609218765432

Table 4-20: Ad hoc HI-1 interface XML of a simple UPDATEResponse payload (sent by PTSS)

4.2.3.9.5 Ad hoc HI-1 interface XML of an UPDATE request payload (real-time simple interception deactivation)

ETSI TS 103 120 V1.9.1 Clause 6.4 Action Request and Responses		
UPDATE request LITask		
Element or attribute	**Description**	**Example**
UPDATE		
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
LITask		
Reference	LIID	201609218765432
DesiredStatus/ common:Owner		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	PTSS
DesiredStatus/ common:Name		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	TaskDesiredStatus
DesiredStatus/ common:Value		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	Deactived
TimeSpan/ EndTime		
	QualifiedDateTime	2016-12-30T12:00:00+01:00

Table 4-21: Ad hoc HI-1 interface XML of a simple UPDATE request payload

4.2.3.9.6 Ad hoc HI-1 interface XML of an UPDATEResponse payload (real-time simple interception deactivation)

ETSI TS 103 120 V1.9.1 Clause 6.4		
UPDATEResponse LITask		
Element or attribute	**Description**	**Example**
UPDATEResponse		
Identifier	Object Identifier UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
LITask		
Reference	LIID	201609218765432

Table 4-22: Ad hoc HI-1 interface XML of a simple UPDATEResponse payload

4.2.3.9.7 Ad hoc HI-1 interface XML of a UPDATE request payload (real-time simple interception deactivation)

ETSI TS 103 120 V1.9.1 Clause 6.4 Action Request and Responses		
UPDATE request LITask		
Element or attribute	**Description**	**Example**
UPDATE		
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
LITask		
Reference	LIID	201609218765432
DesiredStatus/ common:Owner		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	PTSS
DesiredStatus/ common:Name		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	TaskDesiredStatus
DesiredStatus/ common:Value		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	Deactivated
Timespan/ EndTime		
	QualifiedDateTime	2016-12-30T15:00:00+02:00

Table 4-23: Ad hoc HI-1 interface XML of a simple UPDATE request payload (sent by CSP)

4.2.3.9.8 Ad hoc HI-1 interface XML of an UPDATEResponse payload (real-time simple interception deactivation)

ETSI TS 103 120 V1.9.1 Clause 6.4		
UPDATEResponse LITask		
Element or attribute	**Description**	**Example**
UPDATEResponse		
Identifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
LITask		
Reference	LIID	201609218765432
Status/ common:Owner	TaskStatus PTSS proprietary dictionary entry and ShortString	PTSS
Status/ common:Name	TaskStatus PTSS proprietary dictionary entry and ShortString	TaskStatus
Status/ common:Value	TaskStatus PTSS proprietary dictionary entry and ShortString	deactivated

Table 4-24: Ad hoc HI-1 interface XML of a simple UPDATEResponse payload (sent by PTSS)

4.2.3.9.9 Ad hoc HI-1 interface XML of a UPDATE request payload for error (real-time simple interception)

In case of error due to a request error use the elements shown in the table below (UPDATERequest):

ETSI TS 103 120 V1.9.1 Clause 6.4 Action Request and Responses		
UPDATE request LITask		
Element or attribute	**Description**	**Example**
UPDATE		
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
LITask		
Reference	LIID	201609218765432
DesiredStatus/ common:Owner		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	PTSS
DesiredStatus/ common:Name		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	TaskDesiredStatus
DesiredStatus/ common:Value		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	Rejected
InvalidReason ErrorCode	Detailed error codes in ETSI TS 103 120 V1.9.1 Annex D.	3009
ErrorDescription		Value not found in system.

Table 4-25: Ad hoc HI-1 interface XML of an UPDATE request payload for error (sent by CSP)

4.2.3.10 Applicable XML schema version for real-time interception instructions on the ad hoc HI1 interface

The XML schema versions are identical to the ones stated in section 4.2.2.9.

4.2.4 HI-A XML over HTTP administrative interface for retained data instructions (HI-A ETSI TS 102 657 V2.6.1)

Based on ETSI TS 102 657 V2.6.1 clause 4.5, HI-A can use the encoding and delivery format XML over HTTP. The requirements and options for this handover interface are detailed in the section 7.5.

Retained data instructions encompass the historical data (aka retroactive interception) (see section 7) and the information requests (see section 8).

4.2.4.1 Transport security

Implementations shall support HTTPS as defined in IETF RFC 2818, including the support for mutual authentication through bidirectional certificate usage.
The exchange of the certificates and security requirements (such as key management, key length and the choice of cryptographic algorithm) is an implementation issue and shall be determined by the PTSS based on consultations with the CSP.

4.2.4.2 Message flow for XML over HTTP instruction processing for retained data

The content of the XML requests are specified in sections 7.3 and 7.4 for the historical data and in sections 8.3 and 8.4 for the Information Requests.

4.2.4.2.1 Message flow for successful XML over HTTP instruction processing for retained data

The message flow of the XML over HTTP interception instructions for retained data exchange between the PTSS and CSP in case of successful processing is according to ETSI TS 102 657 V2.6.1 clause 5.2.1 (flows noted HI-A).

4.2.4.2.2 Message flow for errors or failed XML over HTTP instruction processing for retained data

The message flow of the XML over HTTP interception instructions for retained data exchange between the PTSS and CSP in case of errors and failed processing is according to ETSI TS 102 657 V2.6.1 clause 5.1.5 and the specific requirements described in the section 7.5.

4.2.4.2.3 Message flow for cancellation XML over HTTP instruction processing for retained data

The message flow of the XML over HTTP interception instructions for retained data exchange between the PTSS and CSP in case of cancellation processing is according to ETSI TS 102 657 V2.6.1 clause 5.2.2 and the specific requirements described in the section 7.5.

4.3 Secure Email Exchange

4.3.1 General

The administrative interface using secure email may be used to support several administrative processes as mentioned in the tables above in section 4.1. In addition, the secure email can also be used to transport results of retroactive interception and information requests results.

4.3.2 Secure email with OpenPGP and keys management

The secure email interface uses OpenPGP as specified in the IETF RFC 9580 with the specific requirements and options indicated below:

1. Keys must have at least a 2048-bit size and a validity period of at least 3 years.
2. PGP signed and encrypted data (email body and/or attachments) must be encoded in ASCII armor. (with the suffix .asc).
3. Data (email body and/or attachments) must be first OpenPGP signed and then OpenPGP encrypted. This process can occur in one step or two steps. The whole email must not be signed nor encrypted.
4. Each organisation (CSP and PTSS) is responsible for the generation and the management of its own OpenPGP certificates and related private and public keys. Each organisation shall exchange its public key only and perform the check of the key's fingerprint via another channel than email, for instance by phone.
5. Before the keys expire the PTSS and CSP are responsible for generating new keys and to inform the other party at least 30 calendar days in advance. If a key has been revoked a new key must immediately be generated and sent to the other party.

4.3.3 Secure email for interception instructions and information requests

In order to support the use of secure email for processing of interception instructions the following requirements must be met:

Dedicated email addresses must be created and maintained by each organisation. This email address shall only be used for processing interception instructions. These specific email addresses and corresponding public keys are exchanged bilaterally between the PTSS and each CSP.

- The CSP email address must follow the format `LI_monitor@csp-domain`. The CSP shall generate and maintain the corresponding OpenPGP key pair for this address. This email address shall only be used for the processing of interception instructions, information requests and notifications.
- The PTSS maintain several email addresses to process instructions and generate and maintain the corresponding OpenPGP key pairs.

There are two different types of instructions that can be sent via secure email by the PTSS:

i) Instructions for real-time interceptions that are using a subset of the HI-1 eWarrant defined in ETSI TS 103 120 V1.9.1, see section 4.3.3.1

ii) Instructions for historical data and information requests that are using the retained data handover interface HI-A defined in ETSI TS 102 657 V2.6.1, see section 4.3.3.2

4.3.3.1 Message flow for secure email instruction processing for real-time interceptions

The interception instruction via secure email contains an XML file that is based on ETSI TS 103 120 V1.9.1 and an instruction form that is more easily readable by non-technical personnel.

The ETSI TS 103 120 V1.9.1 based XML structure and elements are described in details in section 4.2.2.8.

4.3.3.1.1 Message flow for email activation instruction processing for real-time interceptions

The following figure shows the message flow of the secure email interception activation instructions for real-time interceptions exchange between the PTSS and CSP in case of successful processing.

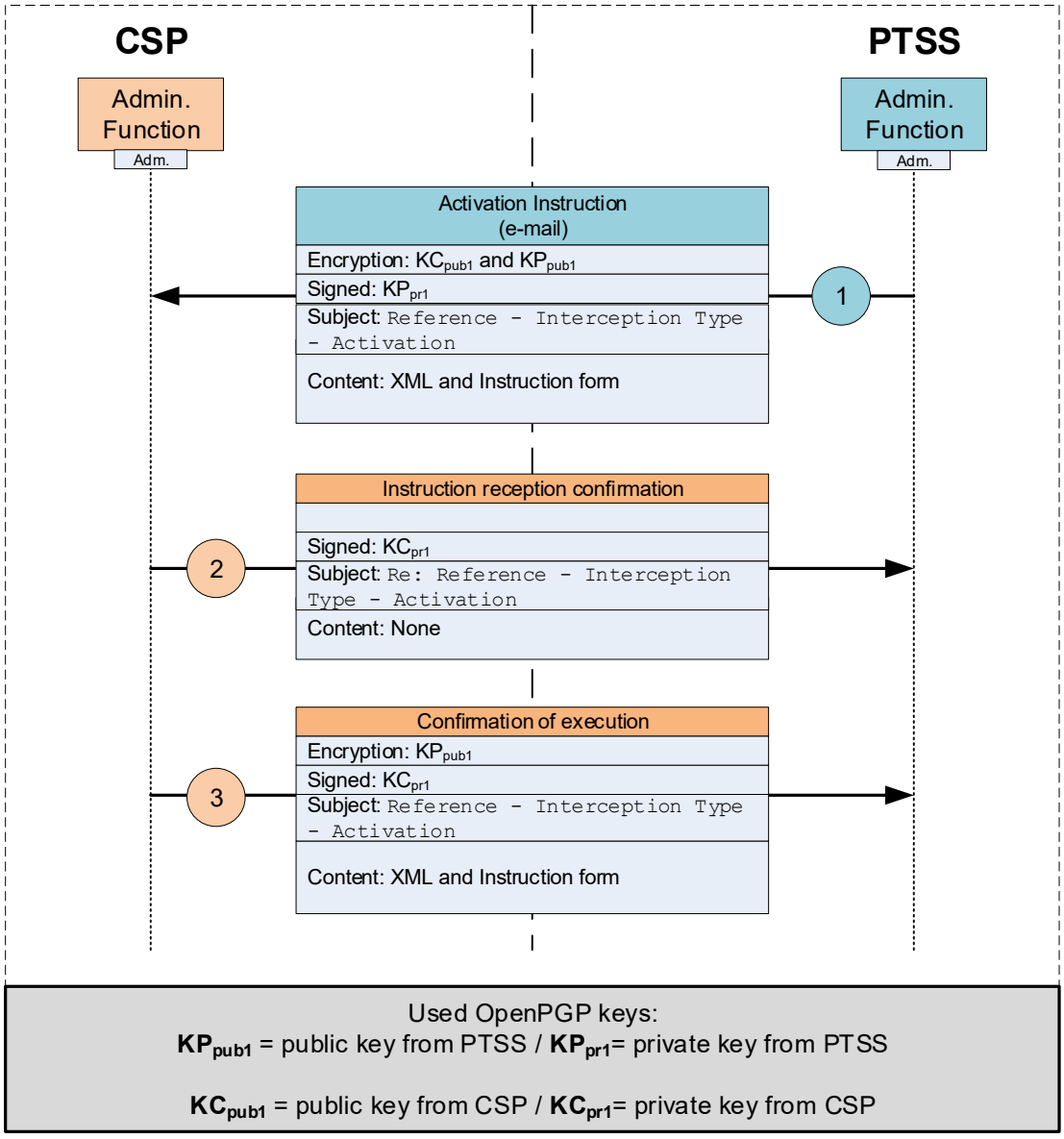

Figure 4-12: Message flow for email activation instruction processing for real-time interceptions

Note: The term “order” refers to the order (warrant) delivered from the authority to the PTSS. The PTSS then sends an “instruction” to the respective CSP.

① PTSS sends an email with the interception instruction. The instruction is an activation instruction using the CREATE request action in the XML (see details in section 4.3.3.1.5). The body and the attachments of the email are signed and encrypted with the OpenPGP keys.

Examples of the email subject line:

```
20190608715852 – RT_22_NA_IRI – Activation
20190708715856 – RT_25_TEL_CC_IRI – Stop
```

② CSP confirms the reception of the secure email instruction by sending back the received email body but without the attachments. The email body is the same as in step ① (already signed and encrypted) and signed with the CSP key.

③ Once the interception has been activated the CSP sends back the filled-in instruction form as a signed and encrypted attachment. The CSP may use the CREATEResponse action in the XML file (see details in section 4.3.3.1.5).

4.3.3.1.2 Message flow for email deactivation instruction processing for real-time interceptions

The following figure shows the message flow of the secure email interception deactivation orders for real-time interceptions exchange between the PTSS and CSP in case of successful processing.

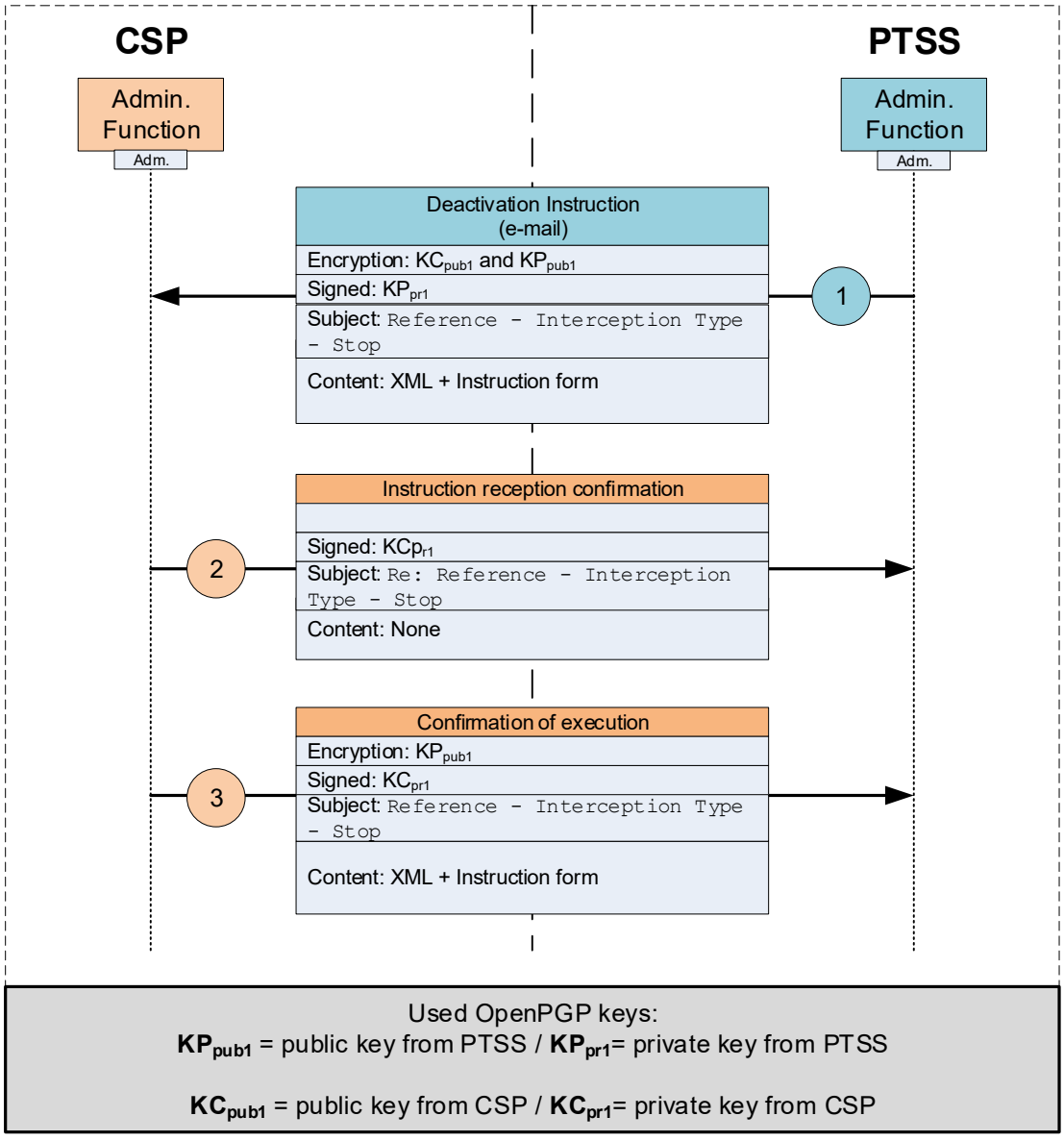

Figure 4-13: Message flow for email deactivation instruction processing for real-time interceptions

① PTSS sends an email with the interception instruction. The instruction is a deactivation instruction using the UPDATE request action in the XML (see details in section 4.3.3.1.5). The body and the attachments of the email are signed and encrypted with the OpenPGP keys.

② CSP confirms the reception of the secure email instruction by sending back the received email body but without the attachments. The email body is the same as in step ① (already signed and encrypted) and signed with the CSP key.

③ Once the interception has been deactivated the CSP sends back the filled-in instruction form as a signed and encrypted attachment. The CSP shall use the UPDATEResponse action in the XML file (see details in section 4.3.3.1.5).

4.3.3.1.3 Message flow for email cancellation instruction processing for real-time interceptions

The following figure shows the message flow in case of a cancellation instruction.

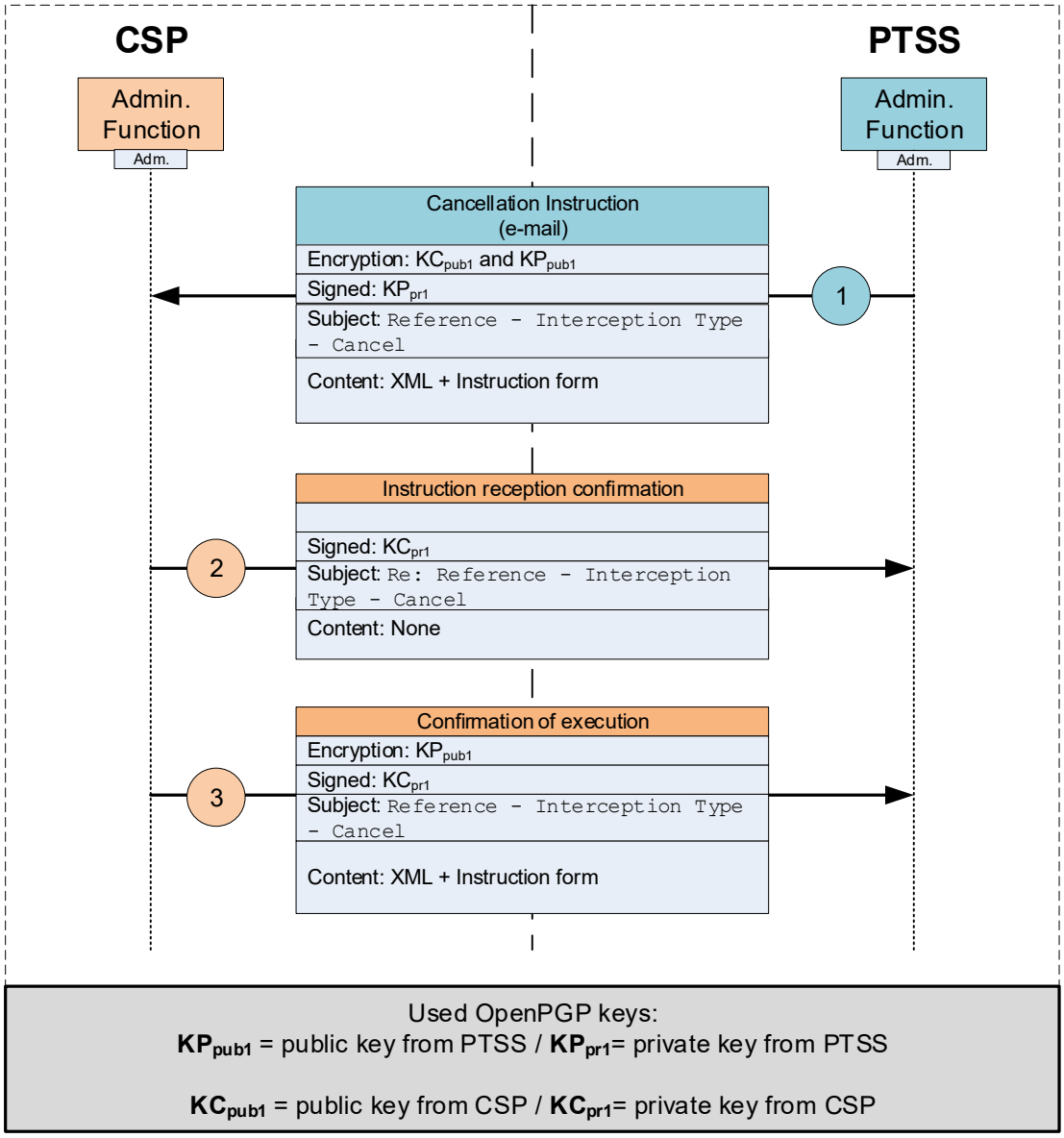

Figure 4-14: Message flow for email cancellation instruction processing for real-time interceptions

The PTSS may cancel an interception activation instruction that has already been sent to the CSP, as long as the CSP has not yet executed the instruction, i.e. for real-time interceptions if the interception was not yet activated in the CSP's systems.
In order to be effective, the cancellation instruction must be issued immediately by PTSS in order to avoid that the CSP activates the interception. For that purpose the PTSS must immediately contact the CSP by telephone and request the cancellation of the interception activation instruction. If the CSP confirms that the activation instruction can be cancelled then the initial cancellation request made by telephone must be promptly confirmed by PTSS in writing by sending a complete cancellation instruction to the CSP.

If the cancellation process fails because the CSP had already activated the real-time interception before the cancellation could take place, the PTSS shall issue a deactivation instruction to terminate the interception.

① PTSS sends an email with the interception instruction. The instruction is a cancellation instruction using the UPDATE request action in the XML (see details in section 4.3.3.1.5). The body and the attachments of the email are signed and encrypted with the OpenPGP keys.

② CSP confirms the reception of the secure email instruction by sending back the received email body but without the attachments. The email body is the same as in step ① (already signed and encrypted) and signed with the CSP key.

③ Once the interception activation instruction has been cancelled the CSP sends back the filled-in instruction form as a signed and encrypted attachment. The CSP may use the UPDATEResponse action in the XML file (see details in section 4.3.3.1.5).

4.3.3.1.4 Message flow for error of email instruction activation processing for real-time interceptions

The following figure shows the message flow in case of error.

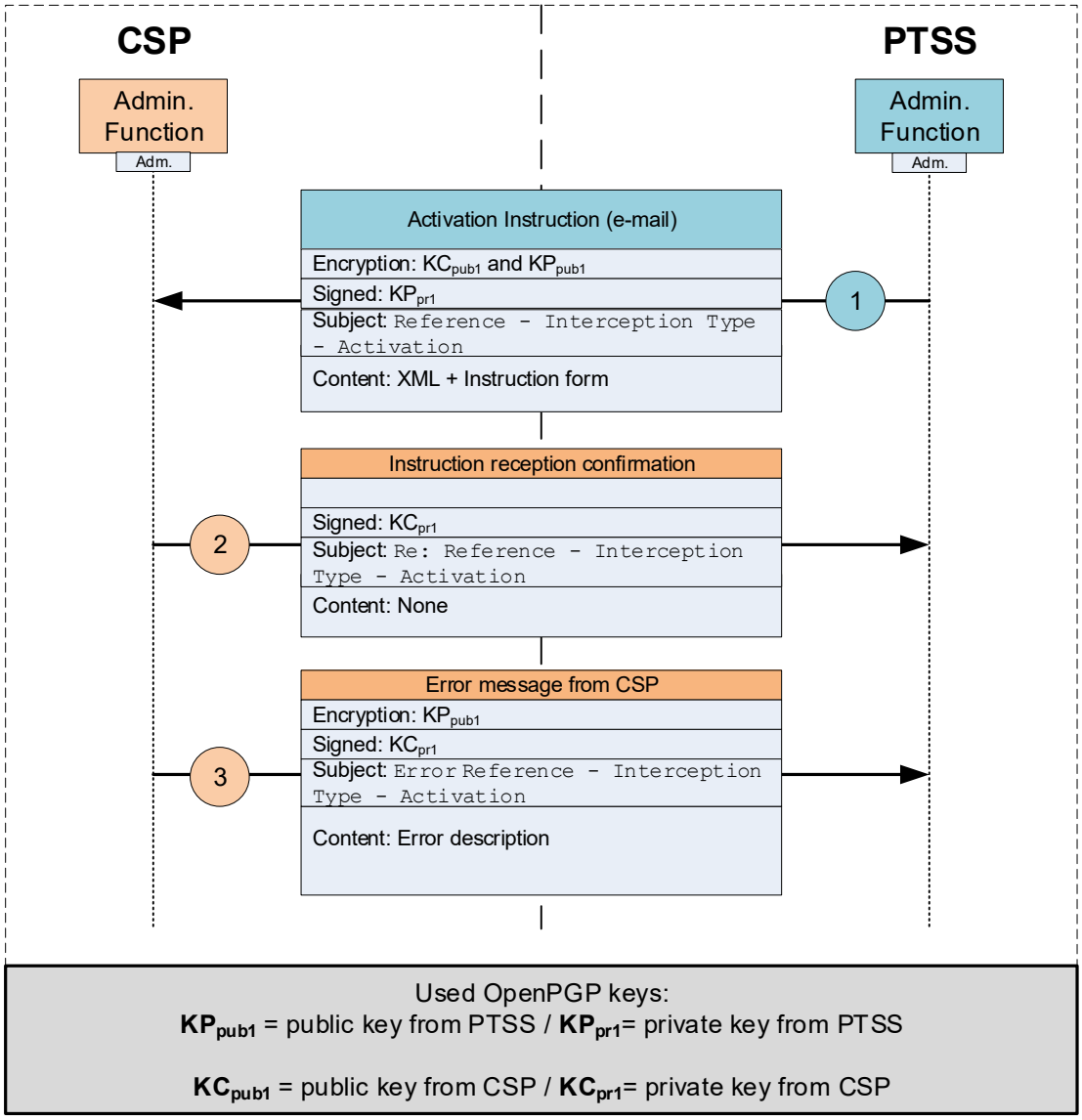

Figure 4-15: Message flow for error of email instruction activation processing for real-time interceptions

In case of error of the interception instruction by the CSP the message flow remains the same as described in section 4.3.3.1.1; however, in step ③ the CSP shall inform the PTSS of the error of the instruction by adding:
i) the corresponding notification and explanation in the instruction form and/or XML (see details in section 4.2.3.8).
ii) a prefix "`Error`" in the email's subject line.
For instance: `Error 20181210357749 – RT_25_TEL_CC_IRI - Activation`

4.3.3.1.5 XML Structure and elements for email real-time interception instructions

The HI-1 and LITask object fields only are attached to the emails. The fields remain compliant with the ETSI TS 103 120 V1.9.1 definitions of the XSD and XML as specified in section 4.2.2.9.

The figures below shows the messages exchanged during an interception activation and deactivation and cancellation transaction. The collection of messages below detail the structure of the XML that are attached to the secure emails.

Action message (Request or Response)
XML header
TransactionIdentifier
Timestamp
XML payload

CREATE request Activation LITask
XML header section
ee4165be-4817-11e6-beb8-9e71128cae77
2016-07-12T12:10:00.000000Z
XML message

CREATEResponse Activation LITask acknowledgement
XML header section
ee4165be-4817-11e6-beb8-9e71128cae77
2016-07-14T13:40:00.000000Z
XML message

UPDATE request Deactivation LITask
XML header section
d8c14821-a4d5-4481-9076-7e3b649c9f66
2016-12-30T12:00:00.000000Z
XML message

UPDATEResponse Deactivation LITask acknowledgement
XML header section
d8c14821-a4d5-4481-9076-7e3b649c9f66
2016-12-30T15:00:00.000000Z
XML message

UPDATE request Cancellation LITask
XML header section
2633ce5b-1775-42fd-8bd1-2aa11063689c
2016-07-13T12:00:00.000000Z
XML message

UPDATEResponse Cancellation LITask acknowledgement
XML header section
2633ce5b-1775-42fd-8bd1-2aa11063689c
2016-07-13T15:00:00.000000Z
XML message

UPDATE request rejected LITask
XML header section
2633ce5b-1775-42fd-8bd1-2aa11063689c
2016-07-12T14:00:00.000000Z
XML message

Figure 4-16: XML Structure and elements for email real-time interception instructions

4.3.3.1.5.1 Elements composing the XML header for request and response

The table below shows the different elements composing the header of the different XML messages (Requests and Responses).

ETSI TS 103 120 V1.9.1 Clause 6.2 Messages header		
Element or attribute	**Description**	**Example**
SenderIdentifier/ CountryCode		
	ISOCountryCode (giving 3166-1 alpha-2 code	CH
SenderIdentifier/ UniqueIdentifier		
	LongString	PTSS
ReceiverIdentifier/ CountryCode		
	SenderIdentifier	CH
ReceiverIdentifier/ UniqueIdentifier		
	ReciverIdentifier: CSP 5-digit code provided by the PTSS.	99908
TransactionIdentifier	UUID in IETF RFC 4122 canonical form	ee4165be-4817-11e6-beb8-9e71128cae77
Timestamp	QualifiedMicrosecondDateTime	2016-07-12T12:10:00.000000Z
Version/ ETSIVersion		
	ShortString of the form "VX.Y.Z" (X gives major version, Y gives minor version, Z gives revision.	V1.3.1 or V1.9.1
Version/ NationalProfileOwner		
	National profile owner	PTSS
Version/ NationalProfileVersion		
	ShortString	V3.0.0

Table 4-26: Elements composing the XML header for request and response

4.3.3.1.5.2 Elements of the HI-1 and LITask objects for activation request

The activation requests uses the elements shown in the table below (CREATE):

CREATE		
Element or attribute	Description	Example
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
CountryCode	ShortString and ISO 3166-1 Alpha-2 code	CH
OwnerIdentifier	ShortString	PTSS
ExternalIdentifier	LongString	20160921876543
LITask		
Reference	LIID	201609218765432
DesiredStatus/ common:Owner		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	PTSS
DesiredStatus/ common:Name		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	TaskDesiredStatus
DesiredStatus/ common:Value		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	Active
TimeSpan/ StartTime		
	QualifiedDateTime	2016-07-13T12:00:00+02:00
TargetIdentifier/ TargetIdentifierValues/ FormatType/ FormatOwner		
	ShortString	ETSI
TargetIdentifier/ TargetIdentifierValues/ FormatType/ FormatName		
	ShortString	InternationalE164
TargetIdentifier/ TargetIdentifierValues/ Value		
	LongString	41598889988
TaskDeliveryDetails/ DeliveryDestination/ IRIorCC / common:Owner		

	TaskDeliveryType ETSI dictionary. ShortString	PTSS
TaskDeliveryDetails/ DeliveryDestination/ IRIorCC / common:Name		
	TaskDeliveryType ETSI dictionary. ShortString	PTSSNationalRequestTypes
TaskDeliveryDetails/ DeliveryDestination/ IRIorCC / common :Value		
	TaskDeliveryType dictionary owned by the PTSS	RT_23_NA_CC_IRI
DeliveryDetails/ DeliveryDestination/ DeliveryProfile/ common:Owner		
	ShortString	PTSS
DeliveryDetails/ DeliveryDestination/ DeliveryProfile/ common:Name		
	ShortString	DeliveryProfile
DeliveryDetails/ DeliveryDestination/ DeliveryProfile/ common:Value		
	DeliveryProfile dictionary owned by PTSS	Production
CSPID/ CountryCode		
	See SenderIdentifier	CH
CSPID/ UniqueIdentifier		
	See SenderIdentifier	99908
Flags/ TaskFlag/ common:Owner		
	FlagStatus dictionary owned by the PTSS. ShortString	PTSS
Flags/ TaskFlag/ common:Name		
	FlagStatus dictionary owned by the PTSS. ShortString	FlagStatus
Flags/ TaskFlag/ common :Value		
	FlagStatus dictionary owned by the PTSS. ShortString	Normal

Table 4-27: Elements of the HI-1 and LITask objects for activation request

4.3.3.1.5.3 Elements of the HI-1 and LITask objects for activation response

The activation response uses the elements shown in the table below (CREATEResponse):

CREATEResponse		
Element or attribute	Description	Example
Identifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
Generation	Positive integer	1
LastChanged	QualifiedDateTime	2016-07-14T12:00:00+02:00
LITask		
Reference	LIID	201609218765432
Status/ common:Owner		
	TaskStatus PTSS proprietary dictionary entry and ShortString	PTSS
Status/ common:Name		
	TaskStatus PTSS proprietary dictionary entry and ShortString	TaskStatus
Status/ common:Value		
	TaskStatus PTSS proprietary dictionary entry and ShortString	Active

Table 4-28: Elements of the HI-1 and LITask objects for activation response

4.3.3.1.5.4 Elements of the HI-1 and LITask objects for deactivation request

The deactivation request uses the elements shown in the table below (UPDATE):

UPDATE		
Element or attribute	Description	Example
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
LITask		
Reference	LIID	201609218765432
DesiredStatus/ common:Owner		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	PTSS
DesiredStatus/ common:Name		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	TaskDesiredStatus
DesiredStatus/ common:Value		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	Deactivated
TimeSpan/ EndTime		
	QualifiedDateTime	2016-12-30T13:00:00+01:00

Table 4-29: Elements of the HI-1 and LITask objects for deactivation request

4.3.3.1.5.5 Elements of the HI-1 and LITask objects for deactivation response

The deactivation response uses the elements shown in the table below (UPDATERsponse):

UPDATEResponse		
Element or attribute	Description	Example
Identifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
Generation	Positive integer	2
LastChanged	QualifiedDateTime	2016-12-30T15:00:00+01:00
LITask		
Reference	LIID	201609218765432
Status/ common:Owner		
	TaskStatus PTSS proprietary dictionary entry and ShortString	PTSS
Status/ common:Name		
	TaskStatus PTSS proprietary dictionary entry and ShortString	TaskStatus
Status/ common:Value		
	TaskStatus PTSS proprietary dictionary entry and ShortString	deactivated

Table 4-30: Elements of the HI-1 and LITask objects for deactivation response

4.3.3.1.5.6 Elements of the HI-1 and LITask objects for cancellation request

The cancellation request uses the elements shown in the table below (UPDATE):

UPDATE		
Element or attribute	Description	Example
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
LITask		
Reference	LIID	201609218765432
DesiredStatus/ common:Owner		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	PTSS
DesiredStatus/ common:Name		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString)	TaskDesiredStatus
DesiredStatus/ common:Value		
	TaskDesiredStatus PTSS proprietary dictionary entry and ShortString	Cancelled

Table 4-31: Elements of the HI-1 and LITask objects for cancellation request

4.3.3.1.5.7 Elements of the HI-1 and LITask objects for cancellation response

The cancellation response uses the elements shown in the table below (UPDATERsponse):

UPDATEResponse		
Element or attribute	Description	Example
Identifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6e
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
Generation	Positive integer	2
LastChanged	QualifiedDateTime	2016-07-13T13:30:00+02:00
LITask		
Reference	LIID	201609218765432
Status/ common:Owner		
	TaskStatus PTSS proprietary dictionary entry and ShortString	PTSS
Status/ common:Name		
	TaskStatus PTSS proprietary dictionary entry and ShortString	TaskStatus
Status/ common:Value		
	TaskStatus PTSS proprietary dictionary entry and ShortString	Cancelled

Table 4-32: Elements of the HI-1 and LITask objects for cancellation response

4.3.3.1.5.8 Elements of the HI-1 and LITask objects for error

In case of error due to a request error use the elements shown in the table below (UPDATEResponse):

UPDATEResponse		
Element or attribute	Description	Example
Identifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
HI-1 Object		
ObjectIdentifier	UUID according to IETF RFC 4122 canonical form	8a1a0c46-2495-46d5-82c3-1900dcecaaa6
Generation	Positive integer	2
LastChanged	QualifiedDateTime	2016-07-12T13:30:00+02:00
LITask		
Reference	LIID	201609218765432
Status/ common:Owner		
	TaskStatus PTSS proprietary dictionary entry and ShortString	PTSS
Status/ common:Name		
	TaskStatus PTSS proprietary dictionary entry and ShortString	TaskStatus
Status/ common:Value		
	TaskStatus PTSS proprietary dictionary entry and ShortString	Error
InvalidReason		
ErrorCode	Detailed error codes in ETSI TS 103 120 V1.9.1 Annex D.	3009
ErrorDescription		Value not found in system.

Table 4-33: Elements of the HI-1 and LITask objects for error response

4.3.3.2 Message flow for secure email instruction processing for retained data

Retained data instructions encompass the retroactive interception data (see section 7) and the information requests (see Annex 1 section 8).

The secure email transport method allows the exchange of retained data instructions and data in both HI-A and HI-B domains described in ETSI TS 102 657 V2.6.1.

4.3.3.2.1 Message flow for successful email instruction processing for retained data

The following figure shows the message flow of the secure email interception instructions for retained data exchanged between the PTSS and CSP in case of successful processing.

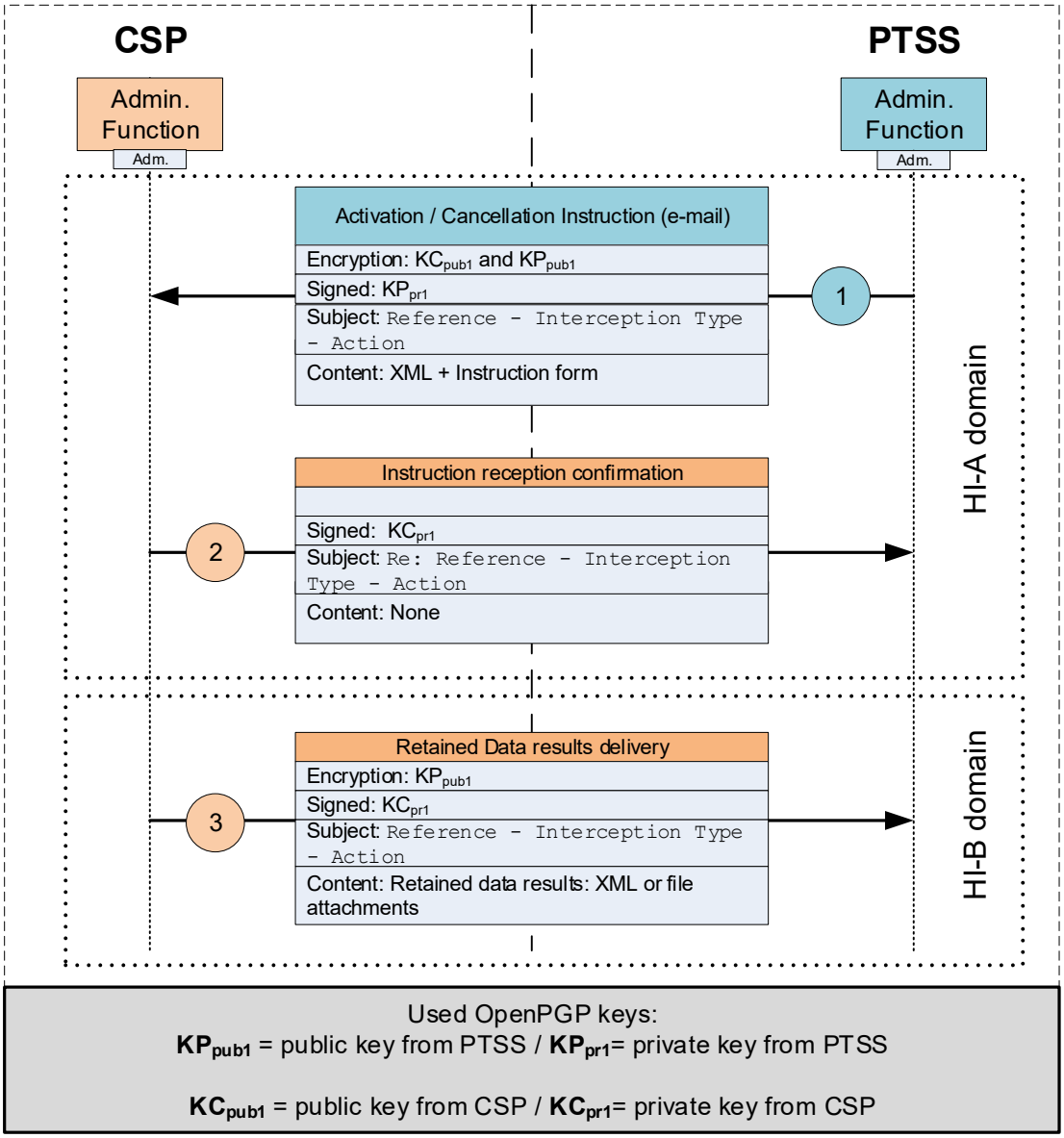

Figure 4-17: Message flow for secure email instruction processing for retained data

① PTSS sends an email with the interception instruction. The order can be an activation instruction, a cancellation instruction or an information request. The XML instruction file is based on the `RDMessage` XSD specified in ETSI TS 102 657 V2.6.1. The body and the attachments of the email are signed and encrypted with the OpenPGP keys.

Examples of the email subject line:
`HD_20190608715852 - HD_28_NA - Activation`
`HD_20190708715856 - HD_29_TEL - Activation`

② CSP confirms the reception of the secure email instruction by sending back the received email body but without the attachments. The email body is the same as in step ① (already signed and encrypted) and signed with the CSP key.

③ Once the CSP has gathered the requested data, two different cases may occur:
i) If an HI-B interface based on HTTPS or SFTP exists between the PTSS and the CSP this step is not necessary as the delivery of the results acts as the confirmation.

ii) The CSP may use the secure email method instead of the HI-B interface and deliver the results as a signed and encrypted attachment in the form of a XML or alternatively a spreadsheet file.

4.3.3.2.2 Message flow for failed email instruction processing for retained data

In case of failure or rejection of the interception instruction by the CSP the message flow remains the same as described in section 4.3.3.2.1; however, in step ③ the CSP shall inform the PTSS of the error/failure or rejection of the instruction by adding:
i) the corresponding notification and explanation in the administrative confirmation form.
ii) a prefix "`Error`" in the email's subject line.
For instance: `Error HD_20181210357749 – HD_28_NA - Activation`

4.3.3.2.3 Message flow for cancellation email instruction processing for retained data

The PTSS may cancel an interception activation instruction that has already been sent to the CSP, as long as the CSP has not yet executed the instruction, i.e. for historical data activations if the historical data has not been sent yet.

In order to be effective, the cancellation instruction must be issued immediately by PTSS in order to avoid that the CSP activates the interception. For that purpose the PTSS must immediately contact the CSP by telephone and request the cancellation of the activation instruction. If the CSP confirms that the activation instruction can be cancelled then the initial cancellation request made by telephone must be promptly confirmed by PTSS in writing by sending a complete cancellation instruction to the CSP.

If the cancellation process fails because the CSP had already sent the retained data before the cancellation could take place, the PTSS shall inform the recipient that the concerned retained data must be destroyed.

4.3.4 Secure email for general and operational information notifications

The OpenPGP secure email method shall be used for the exchange of information between the parties when information confidentiality and integrity is required.

OpenPGP certificates and keys can also be generated for individuals and groups in each organisation (CSP and PTSS). The management of these certificates and keys must follow the requirements described in section 4.3.2.

4.3.4.1 General purpose operational information notifications

Secure email shall be used for the exchange of operational information and notifications between the CSP and the PTSS when the message's confidentiality and integrity is necessary.

If a message does not need to be confidentiality protected it is still recommended to digitally sign the message in order to prove the sender's identity.

The following table provides a non-exhaustive list of operational information notifications that can be exchanged between the parties:

Operational information notifications	VD-ÜPF
Contact notification	Article 4
New services notification	Article 16
System update notification	Article 17
Fault notification	Article 22

Table 4-34: Types of operational information notifications

The notification type must be shown in the subject field of the corresponding email.
For the notification content no specific structure is required.

4.4 Telephone

For urgent interception instructions and information requests or when no other secure communication channel is available the PTSS may use the telephone as the administrative handover interface. An instruction made by telephone shall always be confirmed by the PTSS via an electronic interface as specified in sections 4.2 and 4.3.
PTSS and CSP shall exchange their contact details as described in the provisions of article 5 VD-ÜPF.

4.5 Registered mail

When no other secure communication channel is available the PTSS and the CSP may use the registered mail (postal service) as the administrative handover interface or delivery handover interface for retained data results.
PTSS and CSP shall exchange their contact details as described in the provisions of article 5 VD-ÜPF.

5 Target Identifiers

This section provides information about the potential target identifiers and their formats. The baseline set of target identifiers formats with respect to the real-time and retroactive interception instructions is according to ETSI TS 103 120 V1.9.1 Annex C and their corresponding formats according to ETSI TS 103 280 V2.16.1 clause 6.

Depending on the services provided by the CSP and the type of interception ordered by the LEA, other or special target identifiers might be necessary to implement the interception instruction. In that case PTSS shall determine based on consultation with the CSP on the more appropriate target identifier to be used.

6 Real-time Interception

6.1 General

This section describes the national requirements and options of the handover interfaces (HI2 and HI3) for the delivery of real-time interceptions.

6.2 Real-time interception types

The following tables list the different real-time interception types as stated in the ordinance VÜPF and provide indications about the different supported handover interface requirements and options to be used by the CSP to deliver the real-time interceptions results to the PTSS.

Network access real-time interception			
VÜPF article	**Type & Description** (Informative translation)	**Identifiers Handover Interfaces (Higher version)**	**Section**
54 68 e	**RT_22_NA_IRI** Network access real-time interception with Interception Related Information only	Identifiers parameters ETSI TS 133 108 V18.0.0 or ETSI TS 102 232-1 V3.34.1 & ETSI TS 102 232-3 V3.16.1 or ETSI TS 102 232-7 V3.13.1 & ETSI TS 133 128 V18.12.0	6.3 6.5.2 6.5.3 6.5.5 6.5.8 6.5.9
55 68 d	**RT_23_NA_CC_IRI** Network access real-time interception with Interception Related Information and Content of Communication	Identifiers parameters ETSI TS 133 108 V18.0.0 or ETSI TS 102 232-1 V3.34.1 & ETSI TS 102 232-3 V3.16.1 or ETSI TS 102 232-7 V3.13.1 & ETSI TS 133 128 V18.12.0	6.3 6.5.2 6.5.3 6.5.5 6.5.8 6.5.9

Table 6-1: Network access real-time interception types

Application real-time interception			
VÜPF article	**Type & Description** (Informative translation)	**Identifiers Handover Interfaces (Higher version)**	**Section**
56 68 e	**RT_24_TEL_IRI** Telephony and multimedia services real-time interception with Interception Related Information only	Identifiers parameters ETSI TS 133 108 V18.0.0 or ETSI TS 102 232-1 V3.34.1 & ETSI TS 102 232-5 V3.21.1 or ETSI TS 102 232-1 V3.34.1 & ETSI TS 102 232-6 V3.5.1 or ETSI TS 102 232-7 V3.13.1 &	6.3 6.5.2 6.5.3 6.5.6 6.5.3 6.5.7 6.5.8

		ETSI TS 133 128 V18.12.0	6.5.9
57 68 d	**RT_25_TEL_CC_IRI** Telephony and multimedia services real-time interception with Interception Related Information and Content of Communication	Identifiers parameters ETSI TS 133 108 V18.0.0 or ETSI TS 102 232-1 V3.34.1 & ETSI TS 102 232-5 V3.21.1 or ETSI TS 102 232-1 V3.34.1 & ETSI TS 102 232-6 V3.5.1 or ETSI TS 102 232-7 V3.13.1 & ETSI TS 133 128 V18.12.0	6.3 6.5.2 6.5.3 6.5.6 6.5.3 6.5.7 6.5.8 6.5.9
58 68 e	**RT_26_EMAIL_IRI** Email services real-time interception with Interception Related Information only	Identifiers parameters ETSI TS 102 232-1 V3.34.1 & ETSI TS 102 232-2 V3.16.1	6.3 6.5.3 6.5.4
59 68 d	**RT_27_EMAIL_CC_IRI** Email services real-time interception with Interception Related Information and Content of Communication	Identifiers parameters ETSI TS 102 232-1 V3.34.1& ETSI TS 102 232-2 V3.16.1	6.3 6.5.3 6.5.4

Table 6-2: Application real-time interception types

Emergency search real-time interception			
VÜPF article	**Type & Description** (Informative translation)	**Identifiers Handover Interfaces (Higher version)**	**Section**
67 b	**EP_56_POS_ONCE** One-time, immediate position determination by the network of all mobile terminals of the missing person or of a third person associated with the monitored identifier.	Identifiers parameters ETSI TS 133 108 V18.0.0 or ETSI TS 102 232-7 V3.13.1 & ETSI TS 133 128 V18.12.0	 6.5.2 6.5.8 6.5.9
67 c	**EP_57_POS_PERIOD** Periodically recurring position determination by the network of all mobile terminals of the missing person or a third person associated with the monitored identifier.	Identifiers parameters ETSI TS 133 108 V18.0.0 or ETSI TS 102 232-7 V3.13.1 & ETSI TS 133 128 V18.12.0	 6.5.2 6.5.8 6.5.9
67 d	**EP_36_RT_CC_IRI** Network access and telephony and multimedia services real-time interception with Interception Related Information and Content of Communication	Identifiers parameters ETSI TS 133 108 V18.0.0 or ETSI TS 102 232-1 V3.34.1 & ETSI TS 102 232-5 V3.21.1 or ETSI TS 102 232-1 V3.34.1 & ETSI TS 102 232-6 V3.5.1 or ETSI TS 102 232-7 V3.13.1 &	6.3 6.5.2 6.5.3 6.5.6 6.5.3 6.5.7 6.5.8

		ETSI TS 133 128 V18.12.0	6.5.9
67 e	**EP_37_RT_IRI** Network access and telephony and multimedia services real-time interception with Interception Related Information only	Identifiers parameters ETSI TS 133 108 V18.0.0 or ETSI TS 102 232-1 V3.34.1 & ETSI TS 102 232-5 V3.21.1 or ETSI TS 102 232-1 V3.34.1 & ETSI TS 102 232-6 V3.5.1 or ETSI TS 102 232-7 V3.13.1 & ETSI TS 133 128 V18.12.0	6.3 6.5.2 6.5.3 6.5.6 6.5.3 6.5.7 6.5.8 6.5.9

Table 6-3: Emergency search real-time interception types

Mobile location real-time interception			
VÜPF article	**Type & Description** (Informative translation)	**Identifiers Handover Interfaces (Higher version)**	**Section**
68 a	**ML_50_RT** Mobile location real-time interception is composed of subsets of the network access and the telephony and multimedia services real-time interceptions.	Identifiers parameters Specific requirements for the handover interfaces	6.3 6.5.10
56 a 68 b	**RT_54_POS_ONCE** One-time, immediate position determination by the network of all mobile terminals associated with the monitored identifier.	Identifiers parameters ETSI TS 133 108 V18.0.0 or ETSI TS 102 232-7 V3.13.1 & ETSI TS 133 128 V18.12.0	 6.5.2 6.5.8 6.5.9
56 b 68 c	**RT_55_POS_PERIOD** Periodically recurring position determination by the network of all mobile terminals associated with the monitored identifier.	Identifiers parameters ETSI TS 133 108 V18.0.0 or ETSI TS 102 232-7 V3.13.1 & ETSI TS 133 128 V18.12.0	 6.5.2 6.5.8 6.5.9

Table 6-4: Mobile location real-time interception type

6.3 Common identifiers and parameters of the handover interfaces

This section provides information about the definition and format of several identifiers and parameters that are common to several handover interfaces for the delivery of real-time interception data. Some of these identifiers and parameters are present in all handover interfaces while others are present only in some of them.

6.3.1 Lawful Interception Identifier (LIID)

The LIID parameter is generated by the PTSS and provided to the CSP in the interception instruction and is composed of 15 numbered digits (0..9)

Note that ETSI TS 102 232-1 V3.34.1 imports the LIID parameter from ETSI TS 103 280 V2.16.1 and ETSI TS 133 108 V18.0.0 imports the LawfulInterceptionIdentifier parameter from ETSI TS 101 671 V3.12.1.

6.3.2 Communication Identifier (CID)

The communication identifier (CID) is used in several handover interfaces and defined in ETSI TS 101 671 V3.12.1 clause 6.2 and ETSI TS 102 232-1 V3.34.1 clause 5.2.4.

6.3.2.1 Operator Identity (OperatorID)

The OperatorID in Switzerland has a format of 5 digits.
It is issued by the PTSS and provided to the CSP in the following format:

N	N	N	N	N

Requirements specified by ETSI shall be met as follows:

For the OperatorID contained within the IRI-Records, ETSI TS 101 671 V3.12.1 Annex D.5 and ETSI TS 102 232-1 V3.34.1 Annex A.2 and ETSI TS 133 108 V18.0.0 Annex B the IRI-Parameter `operator-Identifier` applies.

6.3.2.2 Network Element ID (NEID)

The network element identifier distinguishes between the various sources IIF carrying out the LI operations and thus potentially serving the LEMF. Depending on the handover interface in use the NEID may have different formats (e.g., `e164-Format`, `iP-Address`).

Requirements specified by ETSI shall be met as follows:

For the NEID conveyed within the IRI-Records, ETSI TS 101 671 V3.12.1 Annex D.5 IRI-Parameter `Network-Element-Identifier` applies.
Note that ETSI TS 102 232-1 V3.34.1 and ETSI TS 133 108 V18.0.0 import this parameter from ETSI TS 101 671 V3.12.1.

6.3.3 Communication Identity Number (CIN)

The Communication Identity Number (CIN) parameter is used in several handover interfaces and defined in ETSI TS 101 671 V3.12.1 clause 6.2.2 and ETSI TS 102 232-1 V3.34.1 clause 5.2.4.

The CIN parameter is assigned by the CSP.

a. For the CIN in the IRI-Records according to ETSI TS 101 671 V3.12.1 or ETSI TS 133 108 V18.0.0:

For the format of the CIN conveyed as IRI Parameter `communication-Identity-Number`, ETSI TS 101 671 V3.12.1 Annex D.5 applies, with the CIN being encoded as ASCII with a range of 5 up to 8 digits.

b. For the CIN in the IRI-Records according to ETSI TS 102 232-1 V3.34.1:

For the format of the CIN conveyed as IRI Parameter `communicationIdentityNumber`, ETSI TS 102 232-1 V3.34.1 Annex A.2 applies, with the CIN being encoded as integer with a range of 0 up to 4294967295.

As an alternative to the `communicationIdentityNumber` and according to ETSI TS 102 232-1 V3.34.1 clause 5.2.4 the structure `cINExtension` may be used.
To avoid any ambiguity, the `cINExtension` shall not be used simultaneously with the `communicationIdentityNumber` in the same interception product.
The `cINExtension` structure shall use the following ASN.1 schema imported from the `CorrelationValues` of the module `UmtsHI2Operations` of ETSI TS 133 108 V18.0.0:

```
both-IRI-CC      [2]   SEQUENCE
                   iri-CC   [0]   IRI-to-CC-Correlation,
                   iri-IRI  [1]   IRI-to-IRI-Correlation

IRI-to-CC-Correlation ::= SEQUENCE
              cc [0] SET OF OCTET STRING

IRI-to-IRI-Correlation ::= OCTET STRING                (NOTE 1)
```

NOTE 1: When the `cINExtension` is used to deliver only the IRI-to-CC correlation information, the `IRI-to-IRI-Correlation` shall be populated with the same value.

6.3.4 Correlation Numbers and Correlation Values

The Correlation Number and Correlation Values are specified in ETSI TS 133 108 V18.0.0 and ETSI TS 133 128 V18.12.0 for packet switched based services and used to correlate CC and IRI or different IRI records within one PDP context or Bearer or Tunnel or PDU session or VoIP session or conference session or group communication or MBMS session.

The Correlation Numbers and Correlation Values parameters are assigned by the CSP.

Depending on the services the Correlation Numbers and Correlation Values are defined in different clauses of ETSI TS 133 108 V18.0.0 and ETSI TS 133 128 V18.12.0:

Service	**Definition**
Packet data domain (UMTS network access)	ETSI TS 133 108 V18.0.0 §6.1.3
Multi-media domain	ETSI TS 133 108 V18.0.0 §7.1.3
Evolved Packet System (EPS and non-3GPP access)	ETSI TS 133 108 V18.0.0 §10.1.3
IMS Conference service	ETSI TS 133 108 V18.0.0 §11.1.4
IMS-based VoIP Services	ETSI TS 133 108 V18.0.0 §12.1.4
NR (5GS and non-3GPP access to 5GS)	ETSI TS 133 128 V18.12.0 §5.5

Table 6-5: ETSI TS 133 108 V18.0.0 and ETSI TS 133 128 V18.12.0 Services

6.3.5 Timestamp

6.3.5.1 Time synchronisation

The precision of the timestamps generated by the CSP's systems with respect to the reference time base must be within +/- 5 seconds.

The following server is defined as the reference time base:

Alias NTP time server: ntp.metas.ch

It is suggested to use the Network Time Protocol (NTP) according to IETF RFC 5905 for synchronisation, but any other system (e.g. DCF77, GPS, etc.) may also be used as long as the offset from the reference time base remains within the range of +/- 5 seconds.

6.3.5.2 Timestamp formats and precision

The format of the timestamps delivered by the CSP may differ depending on the handover interface used to deliver intercepted data to the PTSS. The timestamps shall at least have a precision to the millisecond. UTC time is always possible and the preferred option.

For the handover interfaces in which the timestamps are defined in ETSI TS 101 671 V3.12.1 and ETSI TS 133 108 V18.0.0 the timestamp can be provided either as:

a) Swiss Local time with the parameter `localTime`: as `GeneralizedTime` with the `winterSummerIndication` parameter set at `winterTime` or `summerTime`.
   Examples: YYYYMMDDHHmmss.fff > 20220311081238.942
   YYYYMMDDHHmmss.ffffff > 20220311081238.942153

b) UTC time as `GeneralizedTime`.
   Examples: YYYYMMDDHHmmss.fffZ > 20220311081238.942Z
   YYYYMMDDHHmmss.ffffffZ > 20220311081238.942153Z

c) Difference between local and UTC time as `GeneralizedTime`.
   Examples: YYYYMMDDHHmmss.fff > 20220311081238.942[+/-]0100
   YYYYMMDDHHmmss.ffffff > 20220311081238.942153 [+/-]0100

NOTE: The parameter `utcTime` shall not be used as it does not support the fractions of seconds.

For the handover interface defined in ETSI TS 102 232-1 V3.34.1 the timestamp can be provided either as:

a) UTC time as `GeneralizedTime`.
   Examples: YYYYMMDDHHmmss.fffZ > 20220311081238.942Z
   YYYYMMDDHHmmss.ffffffZ > 20220311081238.942153Z
   or

b) MicroSecondTimeStamp: with seconds and microseconds, a.k.a UNIX time epoch.

For the handover interface defined in ETSI TS 133 128 V18.12.0 the timestamp shall be provided as UTC time encoded as `GeneralizedTime`.

UTC time as `GeneralizedTime`.
Examples: YYYYMMDDHHmmss.fffZ > 20250614091751.631Z
YYYYMMDDHHmmss.ffffffZ > 20250614081238.631256Z

6.3.6 Transmission of identifiers

The identifiers are to be transferred as follows:

1. CC HI3 interface: For the delivery in the packet switched domain the identifiers shall be transmitted in the packet data unit according to ETSI TS 102 232-1 V3.34.1 Annex A.2 or ETSI TS 133 108 V18.0.0 Annex B.

2. IRI HI2 interface: The necessary identifiers shall be transmitted within every IRI record, to allow correlation at the LEMF.

6.3.7 FTP file naming and parameters for IRI records delivery

For the HI2 handover interfaces defined in ETSI TS 133 108 V18.0.0 the IRI records are delivered to the LEMF with the FTP protocol. The sub-sections below specify the file naming and the necessary parameters to operate the FTP connection.

6.3.7.1 File naming

The composition of the filename is based on the file naming method B according to ETSI TS 133 108 V18.0.0 Annex A.2.

<Filenamestring> of the format ABXYyymmddhhmmsseeeet
Where:
‘AB’ ASCII letters are assigned by PTSS to the CSP
‘XY’ ASCII letters can be chosen by the CSP

6.3.7.2 FTP parameters

When transferring data via FTP the systems of the CSP act as sender (i.e., FTP client), and those of PTSS as recipient (i.e., FTP server).

PTSS operates several LEMF systems; therefore, the CSP shall be able to configure multiple FTP accounts in the mediation function(s) to reach the different LEMF systems. The minimum number shall be 3.

The values of these parameters (e.g., IP address, username and password for the FTP account) are defined during the compliance assessment procedure.
The following rules apply in general:

1. Multiple IRI data sets can be treated as a single file. In case of ASN.1 encoded data, for example, an ‘IRI sequence’ is used for this.
2. It is possible to transfer one or multiple files in the same communication session if these files are already available on CSP systems. When no further files are available, the communication session must be terminated immediately after file transfer.

The following table contains the definitions for the most important FTP parameters:

Value	Content
Document type	binary
Filename	length: 21 characters characters: allowed characters: upper case letters A-Z, digits 0-9
CSP username for LEMF FTP server	length: at least 8 characters characters: lower and upper case letters a-z A-Z, digits 0-9
CSP password for LEMF FTP server	Length: at least 8 characters characters: lower and upper case letters a-z A-Z, digits 0-9
Directory change	It is not allowed to change the directory in the FTP server.
Port for data connection	20/TCP (default value)
Port for control connection	21/TCP (default value)
Mode	FTP passive mode must be supported.

Table 6-6: FTP parameters formats

6.3.8 Location and positioning information

6.3.8.1 Requirements for the Location Function on Mobile Networks via 3GPP access

This section describes the requirements for the Location Function on Mobile Networks via 3GPP access (circuit switched and packet switched domains) making use of the capabilities at the handover interface specified by ETSI.

In particular, this includes the identity of one, or a combination of the entities indicated in the following table:

CGI	Cell Global Identification
ECGI	E-UTRAN Cell Global Identification
SAI	Service Area Identity
RAI	Routing Area Identity
TAI	Tracking area Identity (NOTE 1)
NCGI	NR Cell Global Identity
NOTE 1: The Tracking Area Identity is of variable length depending on the Radio Access Technology in use.	

Table 6-7: Mobile networks location identifications

The identities provided to PTSS shall be the same as the ones actually used on the mobile radio interface.

The geographical coordinates of the antenna serving the target must be indicated in accordance with the WGS84 World Geodetic System and coded according to one of the methods indicated in the following tables.

`GSMLocation` structure in the EpsHI2Operations module of ETSI TS 133 108		
Structure	**Sub-structure**	**Format**

`GSMLocation`	`geoCoordinates`	`latitude XDDMMSS.SS`
		`longitude XDDDMMSS.SS`
		`mapDatum wGS84`
		`azimuth (0..359) OPTIONAL` (NOTE)

NOTE: When a cell is composed of several main beam directions or when it is omnidirectional the corresponding azimuth parameter shall be omitted.		

Table 6-8: Mobile networks location geocoordinates encoding

The CSP must deliver the most accurate location concerning the intercepted mobile network connection. The timestamps used to indicate at what time the location information has been acquired by the network shall be in UTC time.
For the ASN.1 definitions see sections 6.5.1 or 6.5.2 or 6.5.9.

In addition to the cell identity and the geographical coordinates, for EPS and 5GS, the location information in the IRI record shall be complemented with the time of location, and the age of location where available, with the IRI record parameters as follows:

For EPS with E-UTRA as Master Cell Group and NR as Secondary Cell Groups the location information shall be delivered via ETSI TS 133 108 V18.0.0 with the ASN.1 module `EpsHI2Operations` using the EPSLocation and the AdditionalCellIDs sequences with at least the following parameters:

Structure	Parameter	Format
For the Primary Cell of the Master Cell Group (PCell) location information (NOTE 1)		
EPSLocation	userLocationInfo	OCTET STRING (SIZE (1..39))
	gsmLocation	latitude XDDMMSS.SS longitude XDDDMMSS.SS mapDatum wGS84 azimuth (0..359) OPTIONAL (NOTE 2)
	uELocationTimestamp	CHOICE timestamp [0] TimeStamp, timestampUnknown [1] NULL,
Only for the Primary Cell of the Secondary Cell Group (PSCell) Location information (if available)		
AdditionalCellID	nCGI	PLMNID MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) NRCellID BIT STRING (SIZE(36))
	gsmLocation	latitude XDDMMSS.SS longitude XDDDMMSS.SS mapDatum wGS84 azimuth (0..359) OPTIONAL (NOTE 2)
	timeOfLocation	GeneralizedTime
NOTE 1: The EPSLocation structure shall also be used when only one E-UTRA cell is serving the target. NOTE 2: When a cell is composed of several main beam directions or when it is omnidirectional the corresponding azimuth parameter shall be omitted.		

Table 6-9: EPS location information with time of location

For 5GS with NR as Master Cell Group and NR or E-UTRA as Secondary Cell Groups or other access type, the location information shall be delivered via ETSI TS 133 128 V18.12.0 with the ASN.1 module TS33128Payloads using either the NRLocation, EUTRALocation, UTRALocation or GERALocation sequence with the following parameters mainly based on 3GPP TS 29.571 V18.10.0 and the CSP OSS/BSS systems information:

NRLocation structure in TS33128Payloads module	
Parameter	Format
tAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) tAC OCTET STRING (SIZE(2..3))
nCGI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) nRCellID BIT STRING (SIZE(36))
ageOfLocationInfo	INTEGER (NOTE 1)
uELocationTimestamp	timestamp GeneralizedTime (NOTE 2)
globalGNbID	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) aNNodeID CHOICE

	n3IWFID UTF8String gNbID BIT STRING(SIZE(22..32)) nGENbID CHOICE macroNGENbID BIT STRING (SIZE(20)) shortMacroNGENbID BIT STRING (SIZE(18)) longMacroNGENbID BIT STRING (SIZE(21)) eNbID CHOICE macroNGENbID BIT STRING (SIZE(20)) shortMacroNGENbID BIT STRING (SIZE(18)) longMacroNGENbID BIT STRING (SIZE(21)) wAGFID UTF8String tNGFID UTF8String nID UTF8String (SIZE(11))
cellSiteInformation	geographicalCoordinates SEQUENCE (NOTE 3) latitude UTF8String longitude UTF8String mapDatumInformation OGCURN (NOTE 4) azimuth INTEGER (0..359) (NOTE 5)
ignoreNCGI	BOOLEAN

NOTE 1: The value represents the elapsed time in minutes since the last network contact of the mobile station.
NOTE 2: The value represents the UTC time when the UeLocation information was acquired.
NOTE 3: The latitude and longitude are always according to map datum WGS84, refer to 3GPP TS 29.572 V18.9.0 cl.6.1.6.2.4.
NOTE 4: The Open Geospatial Consortium URN used for WGS84 shall be: urn:ogc:def:crs:OGC:1.3:CRS84
NOTE 5: When a cell is composed of several main beam directions or when it is omnidirectional the corresponding azimuth parameter shall be omitted.

Table 6-10: NRLocation structure and parameters for 5GS

EUTRALocation structure in TS33128Payloads module	
Parameter	Format
tAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) tAC OCTET STRING (SIZE(2..3))
eCGI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) eUTRACellID BIT STRING (SIZE(28))
ageOfLocationInfo	INTEGER (NOTE 1)
uELocationTimestamp	timestamp GeneralizedTime (NOTE 2)
globalNGENbID	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) aNNodeID CHOICE n3IWFID UTF8String gNbID BIT STRING(SIZE(22..32)) nGENbID CHOICE macroNGENbID BIT STRING (SIZE(20)) shortMacroNGENbID BIT STRING (SIZE(18))

	longMacroNGENbID BIT STRING (SIZE(21)) eNbID CHOICE macroNGENbID BIT STRING (SIZE(20)) shortMacroNGENbID BIT STRING (SIZE(18)) longMacroNGENbID BIT STRING (SIZE(21)) wAGFID UTF8String tNGFID UTF8String nID UTF8String (SIZE(11))
cellSiteInformation	geographicalCoordinates SEQUENCE (NOTE 3) latitude UTF8String longitude UTF8String mapDatumInformation OGCURN (NOTE 4) azimuth INTEGER (0..359) (NOTE 5)
globalENbID	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) aNNodeID CHOICE n3IWFID UTF8String gNbID BIT STRING(SIZE(22..32)) nGENbID CHOICE macroNGENbID BIT STRING (SIZE(20)) shortMacroNGENbID BIT STRING (SIZE(18)) longMacroNGENbID BIT STRING (SIZE(21)) eNbID CHOICE macroNGENbID BIT STRING (SIZE(20)) shortMacroNGENbID BIT STRING (SIZE(18)) longMacroNGENbID BIT STRING (SIZE(21)) wAGFID UTF8String tNGFID UTF8String nID UTF8String (SIZE(11))
ignoreTAI	BOOLEAN
ignoreECGI	BOOLEAN

NOTE 1: The value represents the elapsed time in minutes since the last network contact of the mobile station.
NOTE 2: The value represents the UTC time when the UeLocation information was acquired.
NOTE 3: The latitude and longitude are always according to map datum WGS84, refer to 3GPP TS 29.572 V18.9.0 cl.6.1.6.2.4.
NOTE 4: The Open Geospatial Consortium URN used for WGS84 shall be: urn:ogc:def:crs:OGC:1.3:CRS84
NOTE 5: When a cell is composed of several main beam directions or when it is omnidirectional the corresponding azimuth parameter shall be omitted.

Table 6-11: EUTRALocation structure and parameters for 5GS

UTRALocation structure in TS33128Payloads module	
Parameter	Format
cGI	lAI pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) lAC OCTET STRING (SIZE(2)) cellID OCTET STRING (SIZE(2))

sAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) lAC OCTET STRING (SIZE(2)) sAC OCTET STRING (SIZE(2))
lAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) lAC OCTET STRING (SIZE(2))
rAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) lAC OCTET STRING (SIZE(2)) rAC OCTET STRING (SIZE(2))
ageOfLocationInfo	INTEGER (NOTE 1)
uELocationTimestamp	timestamp GeneralizedTime (NOTE 2)
cellSiteInformation	geographicalCoordinates SEQUENCE (NOTE 3) latitude UTF8String longitude UTF8String mapDatumInformation OGCURN (NOTE 4) azimuth INTEGER (0..359) (NOTE 5)

NOTE 1: The value represents the elapsed time in minutes since the last network contact of the mobile station.
NOTE 2: The value represents the UTC time when the UeLocation information was acquired.
NOTE 3: The latitude and longitude are always according to map datum WGS84, refer to 3GPP TS 29.572 V18.9.0 cl.6.1.6.2.4.
NOTE 4: The Open Geospatial Consortium URN used for WGS84 shall be: urn:ogc:def:crs:OGC:1.3:CRS84
NOTE 5: When a cell is composed of several main beam directions or when it is omnidirectional the corresponding azimuth parameter shall be omitted.

Table 6-12: UTRALocation structure and parameters for 5GS

GERALocation structure in TS33128Payloads module	
Parameter	Format
locationNumber	NumericString (SIZE(1..15))
cGI	lAI pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) lAC OCTET STRING (SIZE(2)) cellID OCTET STRING (SIZE(2))
rAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) lAC OCTET STRING (SIZE(2)) rAC OCTET STRING (SIZE(2))
sAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) lAC OCTET STRING (SIZE(2)) sAC OCTET STRING (SIZE(2))

lAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) lAC OCTET STRING (SIZE(2))
vLRNumber	UTF8String
mSCNumber	UTF8String
ageOfLocationInfo	INTEGER (NOTE 1)
uELocationTimestamp	timestamp GeneralizedTime (NOTE 2)
cellSiteInformation	geographicalCoordinates SEQUENCE (NOTE 3) latitude UTF8String longitude UTF8String mapDatumInformation OGCURN (NOTE 4) azimuth INTEGER (0..359) (NOTE 5)

NOTE 1: The value represents the elapsed time in minutes since the last network contact of the mobile station.
NOTE 2: The value represents the UTC time when the UeLocation information was acquired.
NOTE 3: The latitude and longitude are always according to map datum WGS84, refer to 3GPP TS 29.572 V18.9.0 cl.6.1.6.2.4.
NOTE 4: The Open Geospatial Consortium URN used for WGS84 shall be:
urn:ogc:def:crs:OGC:1.3:CRS84
NOTE 5: When a cell is composed of several main beam directions or when it is omnidirectional the corresponding azimuth parameter shall be omitted.

Table 6-13: GERALocation structure and parameters for 5GS

In case of EPC/5GS interworking with combined SMF+PGW-C and UPF+PGW-U as described in 3GPP TS 23.501 V18.10.0 clause 4.3 and when the IRI records are delivered according to the Option A specified in 3GPP TS 33.128 V18.12.0 clauses 6.3.1 and 6.3.3.2.1, the EPS location information can be encoded with the structure fourGLocationInfo described in the following table:

fourGLocationInfo structure in TS33128Payloads module	
Parameter	Format
fourGlocationInfo	CHOICE
ePSLocationInformation	SEQUENCE
mMELocationInformation	eCGI tAI geographicalInformation geodeticInformation currentLocationRetrieved ageOfLocationInformation userCSGInformation eNbID additionalCellIDs (3GPP TS 29.272 V17.5.0 clause 7.3.115)
sGSNLocationInformation	cGI lAI sAI rAI geographicalInformation geodeticInformation

	currentLocationRetrieved ageOfLocationInformation userCSGInformation (3GPP TS 29.272 V17.5.0 clause 7.3.116)
ePSUserLocationInformation	OCTET STRING (3GPP TS 29.274 V18.8.0 clause 8.21)

Table 6-14: fourGLocationInfo structure and parameter for EPS location

6.3.8.2 Requirements for the Location Function on Mobile Networks via Non-3GPP access

This section describes in general terms the requirements for the Location Function on Mobile Networks via Non-3GPP access (packet switched domain) making use of the capabilities at the handover interface specified by ETSI.

EPS and 5GS Mobile Networks can be accessed via Non-3GPP access as specified by 3GPP TS 23.402 V18.3.0 for EPS and 3GPP TS 23.501 V18.10.0 for 5GS. The two main categories of Non-3GPP accesses are the “trusted Non-3GPP access” and the “untrusted Non-3GPP access”.

For Untrusted Non-3GPP access to EPS the location information shall be delivered in the IRI record via ETSI TS 133 108 V18.0.0 with the ASN.1 module EpsHI2Operations using the following structure and parameters:

EPS-GTPV2-SpecificParameters structure in EpsHI2Operations module		
Parameter	Format	
uLITimestamp	OCTET STRING (SIZE (8))	(NOTE 1)
uELocalIPAddress	OCTET STRING	(NOTE 2)
uEUdpPort	OCTET STRING (SIZE (2))	(NOTE 3)
NOTE 1: Time in UTC, coded according to 3GPP TS 29.060 V18.0.0 clause 7.7.114. NOTE 2: The UE local IP address reported over GTP based S2b interface. NOTE 3: The UE UDP Port number provided in case of GTP based S2b interface.		

Table 6-15: Location information structure for Untrusted Non-3GPP access to EPS

For Trusted Non-3GPP access to EPS the location information shall be delivered in the IRI record via ETSI TS 133 108 V18.0.0 with the ASN.1 module EpsHI2Operations using the following structure and parameters:

EPS-GTPV2-SpecificParameters structure in EpsHI2Operations module		
Parameter	Format	
tWANIdentifier	OCTET STRING	(NOTE 1)
tWANIdentifierTimestamp	OCTET STRING (SIZE (4))	(NOTE 2)
NOTE 1: The TWAN identifier provided in case of GTP based S2a interface. Format as in 3GPP TS 29.274 V18.8.0 clause 8.100. NOTE 2: The TWAN identifier timestamp provided in case of GTP based S2a interface. Format as in 3GPP TS 29.274 V18.8.0 clause 8.110.		

Table 6-16: Location information structure for Trusted Non-3GPP access to EPS

For Untrusted and Trusted Non-3GPP access to 5GS the location information shall be delivered in the IRI record via ETSI TS 133 128 V18.12.0 with the ASN.1 module TS33128Payloads using the following structure and parameters:

N3GALocation structure in TS33128Payloads module	
Parameter	Format
tAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) tAC OCTET STRING (SIZE(2..3))
N3IWFID	N3IWFIDNGAP ::= BIT STRING (SIZE(16)) (NOTE 1)
uEIPAddr	IPAddr SEQUENCE (NOTE 2) IPv4Address OCTET STRING (SIZE(4)) IPv6Address OCTET STRING (SIZE(16))
portNumber	INTEGER (NOTE 3)
tNAPID	TNAPID SEQUENCE sSID UTF8String bSSID UTF8String civicAddress OCTET STRING
tWAPID	TWAPID SEQUENCE sSID UTF8String bSSID UTF8String civicAddress OCTET STRING
hFCNodeID	HFCNodeID UTF8String
gLI	GLI OCTET STRING (SIZE(0..150))
w5GBANLineType	W5GBANLineType ENUMERATED dSL pON
gCI	GCI UTF8String
ageOfLocationInfo	INTEGER (NOTE 4)
uELocationTimestamp	Timestamp GeneralizedTime
protocol	TransportProtocol uDP tCP
NOTE 1: the N3IWF identifier received over NGAP and shall be encoded as a string of hexadecimal characters. NOTE 2: UE local IPv4 or IPv6 address used to reach the N3IWF. NOTE 3: UDP or TCP source port number. It shall be present if NAT is detected. NOTE 4: The value represents the elapsed time in minutes since the last network contact of the mobile station.	

Table 6-17: Location information structure for Untrusted Non-3GPP access to 5GS

6.3.8.3 Requirements for the Positioning Information

The positioning information provides the estimated position of the target UE expressed in the geographical coordinates of an ellipsoid point with an uncertainty ellipse and a confidence factor. The parameters of the geographical area description are specified in 3GPP TS 23.032 V18.3.0.

6.3.8.3.1 Requirements for the Positioning Information in UMTS and EPS

This section describes the requirements for the positioning information in the UMTS and EPS. The Positioning Information provides the estimated location of the target UE in geographical coordinates of an ellipsoid point with an uncertainty ellipse and a confidence factor.
The positioning information shall be delivered as an IRI REPORT according to ETSI TS 133 108 V18.0.0 Table 10.5.1.1.21 and Annex B.9 but without the optional extended location parameters `extendedLocParameters`:

`LocationOfTheTarget` structure in EpsHI2Operations module	
Parameter	Format
`locationOfTheTarget`	
`Location`	`SEQUENCE`
`GSMLocation`	`CHOICE`
`wGS84Coordinates`	`OCTET STRING` `(3GPP TS 23.032 V18.3.0 clause 7.3.3)`
`uELocationTimestamp`	`TimeStamp`
`locationErrorCode`	`INTEGER (1..699)`

Table 6-18: Positioning information structure for UMTS and EPS

6.3.8.3.2 Requirements for the Positioning Information in 5GS

This section describes the requirements for the positioning information in the 5G System. The Positioning Information provides the estimated location of the target UE in geographical coordinates of an ellipsoid point with an uncertainty ellipse and a confidence factor.
The positioning information shall be delivered in addition to the serving cell location with the following structure and parameters specified in ETSI TS 133 128 V18.12.0 Annex A:

`PositioningInfo` structure in TS33128Payloads module	
Parameter	Format
`positionInfo`	`SEQUENCE`
`LocationData`	`SEQUENCE`

`locationEstimate`	`GeographicArea` **`CHOICE`**
	`point`
	`geographicalCoordinates`
	`latitude UTF8String`
	`longitude UTF8String`
	`(3GPP TS 29.572 V18.9.0 cl.6.1.6.2.4)`
	`mapDatumInformation OGCURN`
	`(ETSI TS 133 128 V18.12.0 cl.7.3.3.1)`
	`pointUncertaintyCircle`
	`geographicalCoordinates`
	`latitude UTF8String`
	`longitude UTF8String`
	`(3GPP TS 29.572 V18.9.0 cl.6.1.6.2.4)`
	`mapDatumInformation OGCURN`
	`(ETSI TS 133 128 V18.12.0 cl.7.3.3.1)`
	`Uncertainty INTEGER (0..127)` NOTE 1
	`UncertaintySBI UTF8String`
	`(3GPP TS 29.572 V18.9.0 cl.6.1.6.3.2)`
	`pointUncertaintyEllipse`
	`(3GPP TS 29.572 V18.9.0 cl.6.1.6.2.8)`
	`geographicalCoordinates`

	latitude UTF8String longitude UTF8String (3GPP TS 29.572 V18.9.0 cl.6.1.6.2.4) mapDatumInformation OGCURN (ETSI TS 133 128 V18.12.0 cl.7.3.3.1) uncertaintyEllipse semiMajor Uncertainty INTEGER (0..127) NOTE 1 semiMinor Uncertainty INTEGER (0..127) NOTE 1 orientationMajor Orientation INTEGER (0..180) (3GPP TS 29.572 V18.9.0 cl.6.1.6.2.22) semiMajorSBI UncertaintySBI UTF8String semiMinorSBI UncertaintySBI UTF8String confidence ::= INTEGER (0..100) (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.2) **polygon** pointList SET SIZE (3..15) OF geographicalCoordinates latitude UTF8String longitude UTF8String (3GPP TS 29.572 V18.9.0 cl.6.1.6.2.4) mapDatumInformation OGCURN (ETSI TS 133 128 V18.12.0 cl.7.3.3.1) **pointAltitude** point geographicalCoordinates latitude UTF8String longitude UTF8String (3GPP TS 29.572 V18.9.0 cl.6.1.6.2.4) mapDatumInformation OGCURN (ETSI TS 133 128 V18.12.0 cl.7.3.3.1) altitude UTF8String (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.2) **pointAltitudeUncertainty** point geographicalCoordinates latitude UTF8String longitude UTF8String (3GPP TS 29.572 V18.9.0 cl.6.1.6.2.4) mapDatumInformation OGCURN (ETSI TS 133 128 V18.12.0 cl.7.3.3.1) Altitude UTF8String (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.2) uncertaintyEllipse semiMajor Uncertainty INTEGER (0..127) NOTE 1 semiMinor Uncertainty INTEGER (0..127) NOTE 1 orientationMajor Orientation INTEGER (0..180)

	semiMajorSBI UncertaintySBI UTF8String semiMinorSBI UncertaintySBI UTF8String (3GPP TS 29.572 V18.9.0 cl.6.1.6.2.22) uncertaintyAltitude INTEGER (0..127) NOTE 1 confidence ::= INTEGER (0..100) (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.2) uncertaintyAltitudeSBI UncertaintySBI UTF8String **ellipsoidArc** point geographicalCoordinates latitude UTF8String longitude UTF8String (3GPP TS 29.572 V18.9.0 cl.6.1.6.2.4) mapDatumInformation OGCURN (ETSI TS 133 128 V18.12.0 cl.7.3.3.1) innerRadius INTEGER (0..327675) uncertaintyRadius INTEGER (0..127) NOTE 1 offsetAngle INTEGER (0..360) includedAngle INTEGER (0..360) confidence INTEGER (0..100) (3GPP TS 29.572 V18.9.0 cl.6.1.6.2.12) uncertaintyRadiusSBI UncertaintySBI UTF8String
accuracyFulfilmentIndicator	AccuracyFulfilmentIndicator ENUMERATED requestedAccuracyFulfilled requestedAccuracyNotFulfilled (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.12)
ageOfLocationEstimate	INTEGER (0..32767) (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.2)
velocityEstimate	VelocityEstimate CHOICE HorizontalVelocity HorizontalSpeed UTF8String Angle INTEGER (0..360) HorizontalWithVerticalVelocity HorizontalSpeed UTF8String Angle INTEGER (0..360) VerticalSpeed UTF8String VerticalDirection ENUMERATED upward downward HorizontalVelocityWithUncertainty HorizontalSpeed UTF8String Angle INTEGER (0..360) SpeedUncertainty UTF8String HorizontalWithVerticalVelocityAndUncertainty HorizontalSpeed UTF8String Angle INTEGER (0..360) VerticalSpeed UTF8String

	VerticalDirection ENUMERATED upward downward SpeedUncertainty UTF8String (hor) SpeedUncertainty UTF8String (vert) (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.2)
positioningDataList	PositioningMethodAndUsage PositioningMethod ENUMERATED cellID eCID oTDOA barometricPresure wLAN bluetooth mBS motionSensor dLTDOA dLAOD multiRTT nRECID uLTDOA uLAOA networkSpecific (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.6) PositioningMode ENUMERATED uEBased uEAssisted conventional (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.7) Usage ENUMERATED unsuccess successResultsNotUsed successResultsUsedToVerifyLocation successResultsUsedToGenerateLocation successMethodNotDetermined (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.9) MethodCode INTEGER (16..31) (3GPP TS 29.572 V18.9.0 cl.6.1.6.2.15)
gnssPositioningDataList	GNSSPositioningMethodAndUsage PositioningMode ENUMERATED uEBased uEAssisted conventional (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.7) GNSSID ENUMERATED gPS galileo sBAS modernizedGPS qZSS gLONASS bDS, nAVIC (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.8)

	Usage unsuccess successResultsNotUsed successResultsUsedToVerifyLocation successResultsUsedToGenerateLocation successMethodNotDetermined (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.9)
eCGI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) eUTRACellID BIT STRING (SIZE(28))
nCGI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) nRCellID BIT STRING (SIZE(36))
altitude	UTF8String (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.2)
barometricPressure	INTEGER (30000..115000) (3GPP TS 29.572 V18.9.0 cl.6.1.6.3.2)
rawMLPResponse	CHOICE
mLPPositionData	UTF8String (OMA-TS-MLP-V3_5-20181211-C)
mLPErrorCode	INTEGER (1..699) (OMA-TS-MLP-V3_5-20181211-C)
NOTE 1: The parameter uncertainty ::= INTEGER has been deprecated and shall set to 0. The parameter uncertaintySBI ::= UTF8String shall be used instead. The deprecation has been introduced in: ETSI TS 133 128 V15.10.0, ETSI TS 133 128 V16.14.0 and ETSI TS 133 128 V17.8.0.	

Table 6-19: Positioning information structure for 5GS

6.3.9 Location and Access Network Information for IMS-based services

6.3.9.1 General

This section describes the requirements for the Access Network Information for IMS-based services that are delivered via the standardised ETSI handover interfaces.
In general the Access Network Information for IMS-based services shall be delivered in the IRI records in the SIP header field “P-Access-Network-Info” as specified in IETF RFC 7315 and RFC 7913 and RFC 7976 and ETSI TS 124 229 V18.8.0 clause 7.2A.4.
For IMS-based services, when a target UE is served simultaneously by multiple radio access technologies (Multi-RAT) only the information of the primary cell of the Master Cell Group shall be provided in the “P-Access-Network-Info” header field.
In order to improve and facilitate the determination of the target’s access type and location, CSP and PTSS may agree to specify and use additional proprietary parameters in the SIP header field “P-Access-Network-Info” delivered to the LEMF.

6.3.9.2 Location and Access Network Information in IRI records based on ETSI TS 133 108 V18.0.0

When IRI records of IMS-based services are delivered based on ETSI TS 133 108 V18.0.0 Annex B.9 the target related “P-Access-Network-Info” header field content shall populate the corresponding values in the PANI-Header-Info and PANI-Location sequences in the delivered IRI records.

The CSP shall indicate whether the delivered access network information is provided by the network or not by using the parameter `network-Provided` in the `PANI-Header-Info` sequence.

For an inbound roaming target in Switzerland using the S8HR roaming method the location information and the time of location shall be delivered according to the information received from the MME through the S-GW/BBIFF according to 3GPP TS 33.108 V17.0.0 clauses 7.5.1 and 12.7.3.

P-Access-Network-Info parameters for 3GPP access in the structure of the EpsHI2Operations module		
For 3GPP access-type or access-class (GERAN, UTRAN or E-UTRAN)		
Parameter	Format	
`PANI-Header-Info`		

`access-Type`
or
`access-Class`
	`OCTET STRING OPTIONAL`
	
	`OCTET STRING OPTIONAL`
		(NOTE 1)

`network-Provided`	`NULL`	(NOTE 2)
`pani-Location`	`Structure`	
`raw-Location`	`OCTET STRING OPTIONAL`	(NOTE 3)
`ePSLocation`		
`userLocationInfo`	`OCTET STRING OPTIONAL`	(NOTE 4)
`gsmLocation`		
`latitude`	`XDDMMSS.SS`	
`longitude`	`XDDDMMSS.SS`	
`mapDatum`	`wGS84`	
`azimuth`	`(0..359)`	(NOTE 5)
NOTE 1: Only one value shall be delivered, either the `access-Type` or the `access-Class`. NOTE 2: The `network-provided` parameter shall be present only if the P-Access-Network-Info is provided by a network function (P-CSCF, S-CSCF, etc…) and not the UE. NOTE 3: The `raw-Location` is a copy of the original P-Access-Network-Info header field. NOTE 4: The `userLocationInformation` parameter is conditional and may be present if available in the network function of the IMS core providing the access network information. NOTE 5: When a cell is composed of several main beam directions or when it is omnidirectional the corresponding azimuth parameter shall be omitted.		

Table 6-20: 3GPP access PANI information in IRI records based on EpsHI2Operations

P-Access-Network-Info parameters for Non-3GPP access in the structure of the EpsHI2Operations module		
For 3GPP access-type or access-class (GERAN, UTRAN or E-UTRAN)		
Parameter	Format	
`PANI-Header-Info`		

`access-Type`
or
`access-Class`
	`OCTET STRING OPTIONAL`
	
	`OCTET STRING OPTIONAL`
		(NOTE 1)

`network-Provided`	`NULL`	(NOTE 2)
`pani-Location`	`Structure`	
`raw-Location`	`OCTET STRING OPTIONAL`	(NOTE 3)

NOTE 1: Only one value shall be delivered, either the `access-Type` or the `access-Class`. NOTE 2: The `network-provided` parameter shall be present only if the P-Access-Network-Info is provided by a network function (P-CSCF, S-CSCF, etc…) and not the UE. NOTE 3: The `raw-Location` is a copy of the original P-Access-Network-Info header field.

Table 6-21: Non-3GPP access PANI information in IRI records based on EpsHI2Operations

6.3.9.3 Location and Access Network Information in IRI records based on ETSI TS 102 232-1 V3.34.1

When IRI records of IMS-based services are delivered based on ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-5 V3.21.1 the target related “P-Access-Network-Info” header field content shall populate the corresponding values in the `Location` sequence in the delivered IRI records.

6.3.9.4 Location and Access Network Information in IRI records based on ETSI TS 133 128 V18.12.0

When IRI records of IMS-based services are delivered based on ETSI TS 133 128 V18.12.0 the target related “P-Access-Network-Info” header field content shall populate some of the corresponding values in the `UserLocation` sequence in the delivered IRI records in order to provide the location information for the mobile 3GPP access-class or access-type (e.g. 3GPP-E-UTRAN, 3GPP-NR) or for the Non-3GPP access-class or access-type (e.g. 3GPP-WLAN, IEEE-802-11, WLAN-no-PS, VIRTUAL-no-PS, WLAN-no-PS). The different access-class and access-type are specified in 3GPP TS 24.229 V18.8.0 clause 7.2A.4.

In case of mobile 3GPP access-class or access-type the tracking area identity, the cell global identity and, if available, the time stamp at which the access network information has been acquired, shall be delivered. The geographical coordinates of the cell serving the target shall also be delivered when the cell is operated by the mobile CSP performing the interception.

For an inbound roaming target in Switzerland using the N9HR roaming method the location information and the time of location shall be delivered according to the information received from the AMF through the SMF/BBIFF according to ETSI TS 133 128 V18.12.0 clause 7.10.

The following Table 6-22 illustrates how the 3GPP access network information of the SIP P-Access-Network-Info header field shall be populated in the corresponding structure of the TS33128Payloads IRI records:

P-Access-Network-Info for 3GPP access in the structure of the TS33128Payloads module	
For 3GPP-E-UTRAN access-type or access-class	
Parameter	Format
`iMSLocation`	
`pANIHeaderInfo`	`SEQUENCE OF PANIHeaderInfo`
`accessNetworkInformation`	`SIPAccessNetworkInformation`
`accessNetworkInfo`	`UTF8String` `Example: 3GPP-E-UTRAN-FDD`
`accessInfo`	`SEQUENCE OF SIPAccessInfo`

`SIPAccessInfo`	`UTF8String`
	`Example:`
	`utran-cell-id-3gpp=2289907072651F04`

pANILocation	SEQUENCE OF SIPLocationInfo
locationInfo	
userLocation	
eUTRALocation	
tAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) tAC OCTET STRING (SIZE(2..3))
eCGI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) eUTRACellID BIT STRING (SIZE(28))
uELocationTimestamp	timestamp GeneralizedTime (NOTE 1)
cellSiteInformation	geographicalCoordinates SEQUENCE (NOTE 2) latitude UTF8String longitude UTF8String mapDatumInformation OGCURN (NOTE 3) azimuth INTEGER (0..359) (NOTE 4)
For 3GPP-NR access-type or access-class	
Parameter	Format
iMSLocation	
pANIHeaderInfo	SEQUENCE OF PANIHeaderInfo
accessNetworkInformation	SIPAccessNetworkInformation
accessNetworkInfo	UTF8String Example: 3GPP-NR-TDD
accessInfo	SEQUENCE OF SIPAccessInfo
SIPAccessInfo	UTF8String Example: utran-cell-id-3gpp =228990708096532651C6
pANILocation	SEQUENCE OF SIPLocationInfo
locationInfo	
UserLocation	
nRLocation	
tAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) tAC OCTET STRING (SIZE(2..3))
nCGI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) nRCellID BIT STRING (SIZE(36))
uELocationTimestamp	timestamp GeneralizedTime (NOTE 1)
cellSiteInformation	geographicalCoordinates SEQUENCE (NOTE 2) latitude UTF8String longitude UTF8String mapDatumInformation OGCURN (NOTE 3) azimuth INTEGER (0..359) (NOTE 4)

NOTE 1: The value represents the UTC time when the access network information was acquired, if available in the P-Access-Network-Info header field.
NOTE 2: The latitude and longitude are always according to map datum WGS84.
NOTE 3: The Open Geospatial Consortium URN used for WGS84 shall be:
`urn:ogc:def:crs:OGC:1.3:CRS84`
NOTE 4: When a cell is composed of several main beam directions or when it is omnidirectional the corresponding azimuth parameter shall be omitted.

Table 6-22: 3GPP access PANI information in IRI records based on TS33128Payloads

The following Table 6-23 illustrates how the Non-3GPP access network information of the SIP P-Access-Network-Info header field shall be populated in the corresponding structure of the TS33128Payloads IRI records:

P-Access-Network-Info for Non-3GPP access in the structure of the TS33128Payloads module	
For Non-3GPP access-type or access-class	
Parameter	Format
iMSLocation	
pANIHeaderInfo	SEQUENCE OF PANIHeaderInfo
accessNetworkInformation	SIPAccessNetworkInformation
accessNetworkInfo	UTF8String Example: IEEE-802.11
accessInfo	SEQUENCE OF SIPAccessInfo
SIPAccessInfo	UTF8String Example: sbc-domain=pcscfZH02
pANILocation	SEQUENCE OF SIPLocationInfo
locationInfo	
userLocation	
n3GALocation	
uEIPAddr	iPv4Address::= OCTET STRING (SIZE(4)) or (NOTE 1) iPv6Address::= OCTET STRING (SIZE(16))
portNumber	INTEGER (NOTE 2)
uELocationTimestamp	timestamp GeneralizedTime (NOTE 3)
protocol	uDP or tCP

NOTE 1: IPv4 or IPv6 address provided in the "`uEIPAddr`" of the P-Access-Network-Info header field.
NOTE 2: Protocol port number provided in the "`portNumber`" of the P-Access-Network-Info header field.
NOTE 3: The value represents the UTC time when the access network information was acquired, if available in the P-Access-Network-Info header field.

Table 6-23: Non-3GPP access PANI information in IRI records based on TS33128Payloads

6.3.10 Cellular Network Information for IMS-based services

6.3.10.1 General

This section describes the requirements for the Cellular Network Information for IMS-based services that are delivered via the standardised ETSI handover interfaces.
The Cellular Network Information for IMS-based services shall be delivered in the IRI records in the SIP header field “Cellular-Network-Info” as specified in ETSI TS 124 229 V18.8.0 clause 7.2.15 and Annex R.3.1.1.A. In case of Non-3GPP access via untrusted WLAN and if the information is available for the target, the Cellular-Network-Info header field shall be delivered in the SIP message and the cellular network information encoded in the corresponding IRI record as specified below. The geographical coordinates of the cell serving the target shall also be delivered when the cell is operated by the mobile CSP performing the interception.

6.3.10.2 Cellular Network Information in IRI records based on ETSI TS 133 128 V18.12.0

The following Table 6-24: Cellular network information in IRI records based on TS33128Payloads illustrates how the cellular network information of the SIP Cellular-Network-Info header field shall be populated in the corresponding structure of the TS33128Payloads IRI records:

Cellular-Network-Info in the structure of the TS33128Payloads module	
Representing 3GPP-E-UTRAN access-type or access-class in Cellular-Network-Info	
Parameter	Format
iMSLocation	
cNIHeaderInfo	SEQUENCE OF SIPCNIHeaderInfo
SIPCNIHeaderInfo	
cellularNetworkInformation	SIPCellularNetworkInformation
cellularNetworkInfo	UTF8String Example: 3GPP-E-UTRAN-FDD
cellularAccessInfo	SEQUENCE OF SIPCellularAccessInfo
accessInfo	UTF8String Example: utran-cell-id-3gpp=2289907072651F04
cellInfoAge	INTEGER (0..999999999)
cNILocation	SEQUENCE OF SIPLocationInfo
locationInfo	
userLocation	
eUTRALocation	
tAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) tAC OCTET STRING (SIZE(2..3))
eCGI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) eUTRACellID BIT STRING (SIZE(28))
cellSiteInformation	geographicalCoordinates SEQUENCE (NOTE 1) latitude UTF8String longitude UTF8String mapDatumInformation OGCURN (NOTE 2) azimuth INTEGER (0..359) (NOTE 3)

Representing 3GPP-NR access-type or access-class in Cellular-Network-Info	
iMSLocation	
cNIHeaderInfo	SEQUENCE OF SIPCNIHeaderInfo
SIPCNIHeaderInfo	
cellularNetworkInformation	SIPCellularNetworkInformation
cellularNetworkInfo	UTF8String Example: 3GPP-NR-TDD
cellularAccessInfo	SEQUENCE OF SIPCellularAccessInfo
accessInfo	UTF8String Example: utran-cell-id- 3gpp=228990708096532651C6
cellInfoAge	INTEGER (0..999999999)
cNILocation	SEQUENCE OF SIPLocationInfo
locationInfo	
userLocation	
nRLocation	
tAI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) tAC OCTET STRING (SIZE(2..3))
nCGI	pLMNID SEQUENCE MCC NumericString (SIZE(3)) MNC NumericString (SIZE(2..3)) nRCellID BIT STRING (SIZE(36))
cellSiteInformation	geographicalCoordinates SEQUENCE ..... (NOTE 1) latitude UTF8String longitude UTF8String mapDatumInformation OGCURN(NOTE 2) azimuth INTEGER (0..359) (NOTE 3)

NOTE 1: The latitude and longitude are always according to map datum WGS84.
NOTE 2: The Open Geospatial Consortium URN used for WGS84 shall be:
urn:ogc:def:crs:OGC:1.3:CRS84
NOTE 3: When a cell is composed of several main beam directions or when it is omnidirectional the corresponding azimuth parameter shall be omitted.

Table 6-24: Cellular network information in IRI records based on TS33128Payloads

6.4 ASN.1 parameters definition

All parameters designated as “conditional“ or “optional” in the ETSI specifications must always be delivered to the LEMF when available and not otherwise specified.

6.5 Handover interfaces requirements and options

This section provides detailed information about the different requirements and options to be used in Switzerland for the handover interfaces specified by ETSI. Depending on the real-time interception type the CSP in agreement with the PTSS may choose to use one of those handover interfaces.

6.5.1 ETSI TS 101 671 V3.12.1 for the lawful interception of telecommunications traffic

This technical specification provides the reference for the formating and encoding requirements for the interception of the PSTN, ISDN, GSM and UMTS telephony services in the circuit switched domain and shall only be used in association with the handover interface specified in the section 6.5.7 of the present document related to the IP delivery of the circuit switched telephony services.
The notifications, IRI and CC records of circuit switched telephony services shall be delivered to the PTSS processing system via an IP delivery network based on ETSI TS 102 232-1 V3.34.1 as specified in 6.5.3.

6.5.1.1 ETSI TS 101 671 V3.12.1 requirements and options

Note: The lawful interception requirements related to the TETRA technology are not applicable in Switzerland.

Clause ETSI TS 101 671 V3.12.1	Selection of ETSI options for Switzerland	Additional requirements
5.1	**Manual/Electronic handover interface 1 (HI1)** An electronic handover interface from the LEMF to the technical infrastructure of the person obliged to cooperate for direct administration of interception measures without the involvement of the the person obliged to cooperate is not implemented in Switzerland. Events regarding the management of an interception (e.g. activation and deactivation) and error communication must be delivered.	See Annex 1 section 4
5.2	**Handover Interface port 2 (HI2)** IRI records shall be delivered via the IP delivery network according to ETSI TS 102 232-1 V2.34.1 and ETSI TS 102 232-6 V3.5.1.	See Annex 1 sections 6.5.3 and 6.5.7
6.2.1	**Network identifier (NID)** The NID is composed of 5 digits: NWO/AP/SvP identifier (Operator identifier). PTSS provides the Operator identifier.	See Annex 1 section 6.3.2.1
8.1	**Data transmission protocol** HI1 notifications, HI2 and HI3 handover interfaces shall use the IP delivery network based on ETSI TS 102 232 V3.24.1.	See Annex 1 section 6.5.3 and 6.5.7
Annex A: Circuit switched network handover		

Clause ETSI TS 101 671 V3.12.1	Selection of ETSI options for Switzerland	Additional requirements
A.3.2.1	**Control information for HI2** The timestamp must include official local time and related DST indication or UTC time in `GeneralizedTime` format.	See Annex 1 section 6.3.5
A.4.1	**Delivery of Content of Communication** CC records shall be delivered via the IP delivery network according to ETSI TS 102 232-1 V2.34.1 and ETSI TS 102 232-6 V3.5.1.	
A.4.2	**Delivery of packetised Content of Communication** For SMS and UUS Services, CC shall be transferred as IRI. For transferring CC data, the ASN.1 module 'HI2Operations' encapsulated in the PstnIsdnPDU module of ETSI TS 102 232-6 V3.5.1 shall be used.	
A.5.4	**Multi party calls – general principles** Only option A is available and must be used.	
A.5.5	**Subscriber Controlled Input (SCI): Activation/Deactivation/Interrogation of services**	In case of analogue or ISDN keypad facility and protocol generating DTMF signals, the DTMF shall be mapped to the functional protocol (e.g. 3GPP TS 24.008 V18.8.0 clause 9.3.24) and delivered directly in the IRI record (e.g. IRI-Continue-Record) in the ASN.1 `PartyInformation` structure using the `Standard-Supplementary-Services` sequence and `DSS1-SS-parameters-codeset-0` set and the main parameter `Keypad facility`.
A.6.3	**Call Hold/Retrieve** If an active call is put on hold, its CC link shall stay intact and the signal from the held party shall be switched through to the LEMF. If the target sets up a new call, while one call is on hold, this call shall be treated as a normal originating call (additional CC link) ETSI TS 101 671 V3.12.1 Annex A.6.3.1 applies. CC links shall stay intact and the signal from the held party shall be switched through.	

Clause ETSI TS 101 671 V3.12.1	Selection of ETSI options for Switzerland	Additional requirements
A.6.4	**Explicit Call Transfer (ECT)** For explicit call transfer, option 2 must be implemented. This means, that the transferred call must not be intercepted.	
A.6.16.1.1	**Call Diversion by target, CC links** For CFNR, UDUB, CD and partial rerouting, option 2 (with CONTINUE-Record) must be implemented.	
A.6.22	**User-to-User Signalling (UUS)** UUS service data shall be delivered as IRI data.	See point A.4.2 in this Table.
A.8.3	**HI3 (delivery of CC**) SMS service data shall be delivered as IRI data. The provider must remove any encryption algorithm applied by the CSP internally in the network at the handover interface.	See point A.4.2 in this Table.
Annex C: HI2 Delivery mechanisms and procedures		
C.1 / C.2	**ROSE / FTP** FTP and ROSE are not used as HI1 notifications, HI2 and HI3 handover interfaces shall use the IP delivery network based on ETSI TS 102 232 V3.24.1.	See point 8.1 in this Table.
Annex D: Structure of data at the Handover Interface		

D.4	`HI1-Operations ::= CHOICE`
	`{`
	`liActivated`
	`[1] Notification,`
	`liDeactivated`
	`[2] Notification,`
	`liModified`
	`[3] Notification,`
	`alarms-indicator`
	`[4] Alarm-Indicator,`
	`...,`
	`National-HI1-ASN1parameters`
	`[5] National-HI1-ASN1parameters`
	`}`
		Depending on the version of the `HI1NotificactionOperations` record used, if the `domainID` parameter exists in the `Notification` sequence, the `OBJECT IDENTIFIER` must be provided.

D.5	The target's location information shall be encoded as specified in section 6.3.8.	The enumerated structure `nature-Of-The-intercepted-call` is limited to the following values:
		`gSM-ISDN-PSTN-circuit-call`
		`gSM-SMS-Message`
		`uMTS-circuit-call`
		`lTE-SMS-Message`

D.4 to D.9	**ASN.1 modules**	The aggregation mechanism for IRI content shall not be used.
Annex I: Evolved Packet System Handover		
I	**Evolved Packet System handover**	See Annex 1 section 6.5.2

Clause ETSI TS 101 671 V3.12.1	Selection of ETSI options for Switzerland	Additional requirements
	For Evolved Packet System the Lawful Interception handover interface defined in ETSI TS 133 108 V18.0.0 shall be used.	

Table 6-25: ETSI TS 101 671 V3.12.1 requirements and options

The supported ASN.1 Object identifiers and versions are stated in section 6.6

6.5.2 ETSI TS 133 108 Handover interface for Lawful Interception

The handover interface specifications of ETSI TS 133 108 V18.0.0 are based on the description from the specification ETSI TS 133 107 V18.0.0 Lawful interception architecture and functions.

This section specifies the requirements and options that may be used for the delivery of the intercepted data related to all services based on the packet switched domain, such as GPRS, Evolved Packet System (EPS), non-3GPP access, IMS-based VoIP, IMS-based Conference Services, Proximity Services (ProSe), Group Communications Service Enablers (GCSE), Push-to-Talk over Cellular (PTC).

Clause ETSI TS 133 108 V18.0.0	Selection of ETSI options for Switzerland	Additional requirements
4. General		
4.4	**Manual/Electronic Handover Interface 1 (HI1)** An electronic handover interface from the LEMF to the technical infrastructure of the person obliged to cooperate for direct administration of interception measures without the involvement of the person obliged to cooperate is not implemented in Switzerland. Events regarding the management of an interception (e.g., activation and deactivation) and error communication must be delivered.	See Annex 1 section 3
4.4.1	**Handover interface port 2 (HI2)** The IRI records shall not be aggregated for delivery to the LEMF.	
4.4.2	**Handover interface port 3 (HI3)** The destination TCP port number at PTSS (LEMF) is provided by PTSS to each CSP.	The port number can be different for each service. (e.g., Network Access, IMS-based VoIP, PTC)
4.5	**HI2: Interface port for Interception Related Information**	

Clause ETSI TS 133 108 V18.0.0	Selection of ETSI options for Switzerland	Additional requirements
	Buffering of IRI for the purpose of recovery is required, for instance if the transmission of IRI fails.	Buffering of IRI data up to 24 hours
4.5.1	**Data transmission protocol** FTP is used for IRI The FTP connection must be closed immediately after data transmission.	See Annex 1 section 6.3.7
6. Packet data domain		
6.1.2	**Network identifier** The Operator-identifier is composed of 5 digits provided by PTSS. The Network-Element-Identifier (NEID) parameter shall be provided.	
6.5.1.1	**REPORT record information** IRI REPORT record shall be generated when: - GPRS attach (IRI REPORT according to table 6.3) - GPRS detach (IRI REPORT according to table 6.4) - PDP context activation unsuccessful (IRI REPORT according to table 6.5) - location information update (IRI REPORT according to table 6.6) - the target leaves the old SGSN - the SGSN receives the SMS-MO from the target MS. - the SGSN receives the SMS-MT from the SMS-Centre (IRI REPORT according to table 6.7) - Serving System change (IRI REPORT according to table 6.8) - HLR subscriber record change of IMSI or of MSISDN generated by a message to or from the HLR (IRI REPORT according to table 6.9d) - a LALS report is received from the LI LCS Client (IRI REPORT according to table 6.9H) Packet data header and packet data summary reporting shall not be used.	The IRI REPORT for LALS shall be encoded in EpsHI2Operations as specified in Annex 1 section 6.3.8.3.1).
6.5.1.2	**BEGIN record information** IRI BEGIN record shall be generated when: - the target performs a successful PDP context activation - an inter-SGSN Routing Area Update (RAU) occurs and at least one active	

Clause ETSI TS 133 108 V18.0.0	Selection of ETSI options for Switzerland	Additional requirements
	PDP context is active and the PLMN has changed. (IRI BEGIN according to table 6.10)	
6.5.1.3	**CONTINUE record information** IRI CONTINUE record shall be generated when: - the target's PDP context is modified - an inter-SGSN Routing Area Update (RAU) occurs and at least one active PDP context is active and the PLMN has not changed. (IRI CONTINUE according to table 6.12)	
6.5.1.4	**END record information** IRI END record shall be generated when: - the target' PDP context is deactivated (IRI END according to table 6.14)	
7. Multi-media domain		
7	**Multi-media domain** The provision of the lawful interception of services supported by the IP Multimedia Core Network Subsystem (IMS) shall be carried out in conformity with the provisions of the technical specification corresponding to RELEASE 7 or higher, according to the releases in which the telecommunications services in question are found at each time.	
7.1	**Identifiers** Interception is performed on IMS identifier(s) associated with the interception subject including identifier types such as SIP URI and Tel URI and IMEI if available. NOTE: MSISDN and IMSI can be represented in the user part of the SIP URI and Tel URI if available.	
7.1.1	**Lawful Interception Identifier (LIID)** The use of a single LIID for multiple target public user identities (e.g., SIP URI and TEL URI) all pertaining to the same target is required.	
7.1.2	**Network identifier** The Operator-identifier is composed of 5 digits provided by PTSS.	

Clause ETSI TS 133 108 V18.0.0	Selection of ETSI options for Switzerland	Additional requirements
	The Network-Element-Identifier (NEID) parameter shall be provided.	
7.2.1	**Timing** IMS specific timestamp shall have a precision to the millisecond.	
7.3	**Security aspects** The delivery of the IRI records uses one of the delivery networks as described in VD-ÜPF Annex 2. It shall be agreed between the CSP and PTSS.	
7.4	**Quantitative aspects** As the realisation of the IMS-based VoIP services is depending on the user equipment and the CSP network capabilities, the PTSS cannot provide meaningful guidance for the dimensioning of the target interceptions to be supported.	
7.5	**IRI for IMS** The whole SIP message "`sIPMessage`" and XCAP message "`xCAPMessage`", with the corresponding `IMSevent` indication, shall be delivered to the LEMF in the IRI records. The content of the P-Access-Network-Info (PANI) header shall be delivered via the `PANI-Header-Info` structure of the `EpsHI2Operations` module. For SMS over IP interceptions based on IMS, all the SIP messages requests and responses used for the procedures specified in 3GPP TS 24.341 V18.0.0 must be delivered as IRI records. The following optional records shall be supported for HSS interceptions: The Serving System record shall be delivered according to table 7.7, with IMSevent `servingSystem` using the `Current-Previous-Systems` sequence. The Subscriber Record Change record shall be delivered according to table 7.8, with IMSevent `subscriberRecordChange` using	CSP and PTSS may agree to use proprietary SIP header fields in order to help identify the target identity. The SIP header of the SMS-SUBMIT-REPORT and SMS-DELIVER-REPORT shall use the "In-Reply-To" header field to correlate with the initial message request SMS-SUBMIT respectively the SMS-DELIVER.

Clause ETSI TS 133 108 V18.0.0	Selection of ETSI options for Switzerland	Additional requirements
	the `Change-Of-Target-Identity` sequence. The Location Information Request record shall be delivered according to table 7.9, with IMSevent `locationInformationRequest` using the `requesting-Network-Identifier` and the `requesting-Node-Type`	
8. 3GPP WLAN Interworking		
8	**3GPP WLAN Interworking** NOTE: WLAN Interworking specification (3GPP TS 29.234 V11.2.0) is no longer maintained in Release 12 and onwards.	The Non-3GPP access related specifications replace 3GPP WLAN interworking, see 3GPP TS 23.402 V18.3.0.
10 Evolved Packet System (EPS)		
10.1.2	**Network identifier** The Operator-identifier is composed of 5 digits provided by PTSS. The Network-Element-Identifier (NEID) parameter shall be provided.	
10.5.0	**IRI for evolved packet domain** When the mobile network operates in EN-DC mode the indication of the use of a secondary RAT shall be delivered with the parameter `secondaryRATUsageIndication`. For Untrusted non-3GPP access the UE Local IP address and the UE UDP Port must be delivered via the `uELocalIPAddress` resp. `uEUdpPort` parameters of the `EpsHI2Operations` module as specified in section 6.3.9.2.	The location information for the secondary RAT (PSCell) is described in the present document in section 6.3.8.1.
10.5.1.1	**REPORT record information** IRI REPORT record shall be generated when: - E-UTRAN attach (IRI REPORT according to table 10.5.1.1.1) - E-UTRAN detach (IRI REPORT according to table 10.5.1.1.2) - EPS bearer activation unsuccessful (IRI REPORT according to table 10.5.1.1.3) - EPS bearer resource modification (IRI REPORT according to table 10.5.1.1.4) - a tracking area or EPS location update and the target leaves the old	

Clause ETSI TS 133 108 V18.0.0	Selection of ETSI options for Switzerland	Additional requirements
	MME (IRI REPORT according to table 10.5.1.1.5) - a PDN connectivity request (IRI REPORT according to table 10.5.1.1.6) - a PDN disconnection request (IRI REPORT according to table 10.5.1.1.7) - a LALS report is received from the LI LCS Client (IRI REPORT according to table 10.5.1.1.21). LALS records shall be delivered without the event parameter. The following optional records shall be supported by HSS interceptions: The Serving Evolved Packet System record shall be delivered according to table 10.5.1.1.12, with EPSevent `servingEvolvedPacketSystem` using the `servingMMEaddress` and the `visitedNetworkId`. The HSS subscriber record change record shall be delivered according to table 10.5.1.1.17, with EPSevent `hSS-Subscriber-Record-Change` using the `Change-Of-Target-Identity` sequence. The Location Information Request record shall be delivered according to table 10.5.1.1.20, with EPSevent `locationInformationRequest` using the `requesting-Network-Identifier` and the `requesting-Node-Type`. The packet data header information and packet data summary methods shall not be used.	The IRI REPORT for LALS shall be encoded in EpsHI2Operations as specified in Annex 1 section 6.3.8.3.1).
10.5.1.2	**BEGIN record information** IRI BEGIN record shall be generated when: - EPS bearer or tunnel activation. - a change of S-GW occurs and the PLMN has changed. (IRI BEGIN according to table 10.5.1.2.1)	
10.5.1.3	**CONTINUE record information** IRI CONTINUE record shall be generated when:	

Clause ETSI TS 133 108 V18.0.0	Selection of ETSI options for Switzerland	Additional requirements
	- an active EPS bearer is modified - a change of S-GW occurs and the PLMN has not changed. - in case of handover between different accesses. (IRI CONTINUE according to table 10.5.1.3.1)	
10.5.1.4	**END record information** IRI END record shall be generated when: - EPS bearer deactivation. - Tunnel deactivation. - Resource allocation deactivation. (IRI END according to table 10.5.1.4.1)	
11. 3GPP IMS Conference Services		
11.1.2	The use of a single LIID for multiple target public user identities (e.g., SIP URI and TEL URI) all pertaining to the same target is required.	
11.1.3	**Network identifier** The Operator-identifier is composed of 5 digits provided by PTSS. The Network-Element-Identifier (NEID) parameter shall be provided.	
11.5	**IRI for IMS Conference Services** As mentioned in ETSI TS 133 108 V18.0.0 Table 11.2 the parameters IMPI or IMPU may not be observed and available in the MRFC node.	
11.6	**CC for IMS Conference Services** Section 6.6 provides the list of supported ASN.1 modules.	
12. 3GPP IMS-based VoIP Services		
12.1.3	**Network identifier** The Operator-identifier is composed of 5 digits provided by PTSS. The Network-Element-Identifier (NEID) parameter shall be provided.	
12.6	**CC for IMS-based VoIP** For IMS-based VoIP services the use of the VoIP-HI3-IMS ASN.1 module is preferred to deliver the content of communication. See ETSI TS 133 108 V18.0.0 Annex B.12.	
12.7.3	**LI in VPLMN with S8HR** VoLTE interceptions for inbound roamers shall also be possible in the Serving Gateway of the VPLMN.	

Clause ETSI TS 133 108 V18.0.0	Selection of ETSI options for Switzerland	Additional requirements
	The `VoIPRoamingIndication` parameter shall be set to `roamingS8HR` in the IRI record. The ICE-type in the CC data shall be set to "`lmISF`" or "`sGW`".	
12.7.4	**LI in VPLMN with LBO** The `VoIPRoamingIndication` parameter shall be set to `roamingLBO` in the IRI record.	
13. Interception of Proximity Services (ProSe) NOTE: LI of ProSe service is only available from 3GPP Release 13.		
13.1.1.3	**Network identifier** The Operator-identifier is composed of 5 digits provided by PTSS. The Network-Element-Identifier (NEID) parameter shall be provided.	
13.2.1	**ProSe Direct Discovery** The ProSe discovery events can only be intercepted when the target identity is an IMSI.	
13.2.2	**Events and information** ProSe discovery events shall be delivered with the ASN.1 module `ProSeHI2Operations` via HI2.	
13.3.1	**General** IRI records for the ProSe Remote UE communications shall be delivered with the ASN.1 module `EpsHI2Operations` via HI2. When a ProSe UE-to-NW Relay is a target and the interception of CC is required, the CC of the ProSe Remote UE shall not be delivered to the LEMF.	
14. Invocation of Lawful Interception (LI) for Group Communications System Enablers (GCSE) NOTE: LI of GCSE service is available from 3GPP Release 13.		
14.2	**GCS AS in Intercepting Operator's Network** Only IMSI and IMEI are valid target identities to perform interceptions of GCSE services.	
14.2.2.3	**Network identifier** The Operator-identifier is composed of 5 digits provided by PTSS. The Network-Element-Identifier (NEID) parameter shall be provided.	
14.2.7	**CC for GCSE based Communications**	

Clause ETSI TS 133 108 V18.0.0	Selection of ETSI options for Switzerland	Additional requirements
	The CC shall be delivered on the HI3 interface with the module `GCSE-HI3` specified in Annex 14.2. This ASN.1 structure allows for the reporting of separate media streams for each user in the group communications.	
14.3	**GCS AS Outside Intercepting Operator Network** When the GCS Application Server is outside the intercepting CSP network, only the unicast bearer of the target is intercepted.	
15. Interception of Messaging Services NOTE: Separated LI of messaging service is available from 3GPP Release 15.		
15.1	**Overview** This clause 15 shall not be implemented. In Switzerland the SMS and MMS shall not be reported separately from other services. SMS are reported within the telephony services and MMS are reported within the network access services for GPRS and EPS.	
16. Cell Site Reporting		
16.1	Cell site information is implemented directly in the IRI record that contains a cell identifier. The Cell Site Supplemental Information Reporting is not required.	
17. Interception of PTC NOTE: LI of PTC service is available from 3GPP Release 15.		
17.1.2	**Network identifier** The Operator-identifier is composed of 5 digits provided by PTSS. The Network-Element-Identifier (NEID) parameter shall be provided.	
17.1.4	**CC for PTC-based VoIP** CC for PTC-based-VoIP traffic shall be delivered via HI3 with the ASN.1 module `VoIP-HI3-IMS`.	
17.1.5	IRI for PTC based Communications IRI records for PTC shall be delivered via HI3 with the ASN.1 module `EpsHi2Operations`.	
18. PTC Encryption		
18	When a CSP has PTC services with Security options the CSP shall remove the encryption managed by the CSP and deliver the intercepted traffic in clear to the LEMF.	

Clause ETSI TS 133 108 V18.0.0	Selection of ETSI options for Switzerland	Additional requirements
Annex A: HI2 delivery mechanisms and procedures		
A.0	**Introduction** FTP must be used for transferring IRI data over HI2 interface.	
A.2.2	**Usage of FTP for conveying IRI data** File naming method B must be used.	
A.3	**ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-7 V3.13.1** The HI2 delivery method based on ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-7 V3.13.1 shall not be used for all HI2 IRI records specified in ETSI TS 133 108 V18.0.0.	
Annex B: Structure of data at the handover interface		
B.3 - B.16	The supported ASN.1 Object ID and versions for Switzerland are indicated in the section 6.6.	The aggregation mechanism for IRI content shall not be used.
B.12	**Contents of Communication (HI3 IMS-based VoIP).** The use of the `payload-description` structure can be implemented by CSP and delivered to PTSS.	The content of communication `payload` of the IMS-based VoIP shall be delivered with the transport protocol (e.g., UDP) header and IP headers.
Annex C: UMTS and EPS HI3 interfaces		
C	**UMTS and EPS HI3 interfaces** ULIC header version 1 with TCP/IP described in Annex C.1.3 shall be used.	
C.1.1	**Introduction** When using TCP/IP as transfer method, the used destination port shall be provided by PTSS.	Using UDP for transferring the ULIC header is not allowed.
C.1.3	**Definition of ULIC header version 1** When using ULIC header version 1, the parameters LIID and timeStamp are mandatory.	
C.1.5	The recommended IPsec interface is not used in Switzerland.	The delivery network interface shall be agreed with PTSS. Refer to VD-ÜPF Annex 2.
C.2	**FTP** Usage of FTP for conveying CC data is not supported.	
C.3	**ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-7 V3.13.1** The HI3 delivery method based on ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-7 V3.13.1 shall not be used for all HI3 contents of	

Clause ETSI TS 133 108 V18.0.0	Selection of ETSI options for Switzerland	Additional requirements
	communication specified in ETSI TS 133 108 V18.0.0.	
Annex K: VoIP HI3 Interface		
K.1	**VoIP CC Protocol Data Unit** The VoIP CC Protocol Data Unit shall be delivered to the LEMF using TCP as the transport protocol.	
K.2	**Definition of VoIP LI Correlation header** Provision of the LIID. Provision of the TimeStamp parameter.	The provision of the LIID is mandatory. The provision of the TimeStamp parameter is mandatory.
K.4	**LEMF considerations** IPSec shall not be used. Consider the delivery network specifications in VD-ÜPF Annex 2 for options.	
Annex L: Conference HI3 Interface		
L.1	**Conf CC Protocol Data Unit** The Conference CC Protocol Data Unit (Conf-CC-PDU) is delivered to the LEMF using TCP as the transport protocol.	
L.2	**Definition of Conference LI Correlation header** Provision of the TimeStamp parameter.	The provision of the TimeStamp parameter is mandatory.
L.3	**Definition of Payload** The delivered payload shall include the IP layer and the above protocols (IP/UDP/RTP).	
Annex M: Generic LI notification (HI1 notification using the HI2 method)		
M.1	**HI.1 delivery methods preferences:** As an alternative to the `HI1-Operations` specified in ETSI TS 101 671 V3.12.1 Annex D.4 the `ThreeGPP-HI1NotificationOperations` notification method specified in this annex M can be used to report the activation and deactivation of an interception.	The use of this alternative must be agreed with PTSS.

M.2	**ASN.1 description of LI management notification operation (HI1 interface)**
	The `liActivated` or `liDeactivated` notifications are mandatory.
	The parameters
	`domainID`
	`lawfulInterceptionIdentifier`	

Clause ETSI TS 133 108 V18.0.0	Selection of ETSI options for Switzerland	Additional requirements

	`communicationIdentifier`
	`timestamp`
	`target-Information`
	shall also be delivered.
		In the `Target-Information` sequence only the `liActivatedTime` or `liDeactivatedTime` parameters shall be provided.
		The `liActivatedTime` parameter shall be present in the `liActivated` notification records and the `liDeactivatedTime` shall be present in the `liDeactivated` notification records. The timestamps must be in the format `GeneralizedTime`.

Table 6-26: ETSI TS 133 108 V18.0.0 requirements and options for the packet switched domain

The supported ASN.1 Object identifiers and versions are stated in section 6.6

6.5.3 ETSI TS 102 232-1 V3.34.1 Handover specification for IP delivery

Clause ETSI TS 102 232-1 V3.34.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
5.2.1	**Version** Because an OID is used in the ASN.1 description, a separate parameter is not necessary.	
5.2.2	**LIID** A unique value is assigned by PTSS via the HI1 interface using the mechanism specified in section 4.	
5.2.3	**Authorization country code** 'CH' must be used in Switzerland.	

Clause ETSI TS 102 232-1 V3.34.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
5.2.4	**Communication identifier** In Switzerland, “CH” must be used as the delivery country code (DCC). The Operator identifier (part of NID) is assigned by PTSS.	PTSS provides the OperatorID composed of 5 digits. See Annex 1 section 6.3.2.1 The NEID parameter "`networkElementIdentifier`" or “`eTSI671NEID`” must be provided. An allocated `communicationIdentityNumber` (CIN) value shall not be reused within a time period of 24 hours for the same LIID. The `communicationIdentityNumber` shall not be used simultaneously with the `cINExtension`. See Annex 1 section 6.3.3.
5.2.5	**Sequence number** The sequence number must already be set where the copy of the intercepted telecommunication was first generated (point of interception).	In some case this requirement cannot be met. In such cases, the sequence number must be set before or at the delivery function. In any case, the sequence number must reproduce the precise counting method at the place of origin.
5.2.7	**Payload direction** Must be indicated for CC data.	
5.2.10	**IRI Type**	If present, the IRI Type delivered in the header by the `iRIType` parameter of the `IRIPayload` sequence shall be identical to the IRI Type contained in the service-specific `IRIContents` structure.
5.2.11	**Interception Point Identifier** The delivery of the Interception Point Identifier parameter is optional.	If the `interceptionPointID` parameter is used then the `extendedInterceptionPointID` parameter shall be excluded.
5.2.13	**Extended Interception Point Identifier** In the context of 5G interception the use and delivery of the Extended Interception Point Identifier parameter is described in ETSI TS 102 232-7 V3.13.1 clause 15.4.	If the `extendedInterceptionPointID` parameter is used then the `interceptionPointID` parameter shall be excluded.

Clause ETSI TS 102 232-1 V3.34.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
5.2.14	**Network Function Identifier** In the context of 5G interception the use and delivery of the Network Function Identifier parameter is described in ETSI TS 102 232-7 V3.13.1 clause 15.3.	
6.2.2	**Error reporting** `OperatorLeaMessage` specified in ETSI TS 102 232-1 V3.34.1 Annex A.2 must be used.	Related NID must be mentioned in the Transport Related Information (TRI) message. CSPs shall ensure their equipment is designed to avoid a loss of CIN state and history. The CINReset message shall not be used.
6.2.3	**Aggregation of payloads** Aggregation of payload shall not be used.	
6.2.4	**Sending a large block of application-level data** If segmentation of application-level data is applied the use of the TRI messages with "FirstSegmentFlag" and "LastSegmentFlag" shall be used for the delivery of CC-payload.	This segmentation method may be applied when large emails over 2MB in size must be split into multiple segments with content smaller than 2 MB. Refer to 6.5.4.1 for details.
6.2.5	**Padding data** Padding of data shall not be used.	
6.3.1	**General** TCP/IP must be used.	
6.3.2	**Opening and closing of connections** The described handling of unsuccessful connection establishment must be implemented.	
6.3.4	**Keep-alives** Can optionally be implemented by the CSP.	The use of this option must be agreed with PTSS.
6.3.6	**PDU acknowledgement** PDU acknowledgement without the option negotiation may be used over the transport connection as determined by PTSS after consultation with the CSP.	PTSS determines the values of the timers to be applied after consultation with the CSP.

Clause ETSI TS 102 232-1 V3.34.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
6.4.2	**TCP settings** The destination TCP port number at PTSS (LEMF) is provided by PTSS to each CSP.	PTSS provides a specific port number for each service specification TS 102 232-2 V3.16.1, TS 102 232-3 V3.16.1, TS 102 232-5 V3.21.1 and TS 102 232-6 V3.5.1 and TS 133 128 V18.12.0. The port number can be different for each service and type of record. For some specific services PTSS can mandate that IRI and CC records shall be delivered on different protocol port numbers.
7.1	**Types of network**	The delivery network shall be implemented according to the specifications stated in VD-ÜPF Annex 2 v2.0.
7.2.2	**Confidentiality and authentication**	Depending on the delivery network type in use based on VD-ÜPF Annex 2 v2.0, the confidentiality and authentication method is determined by PTSS after consultation with the CSP.
7.2.3	**Integrity** The CSP, after agreement with the PTSS, may implement the integrity mechanism for HI2 and HI3 according to the guidelines in ETSI TS 102 232-1 V3.34.1 Annex J.	
7.3.1	**Test data** The capability of sending of the test data as Transport Related Information (TRI) is not mandatory.	
7.3.2	**Timeliness**	The possible use of separate managed networks must be agreed with PTSS.

Clause ETSI TS 102 232-1 V3.34.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
Annex A.2	**ASN.1 specification** 5GC NR lawful interception IRI and CC records specified in ETSI TS 133 128 V18.12.0 are delivered via the parameters `threeGPP33128DefinedIRI` and `threeGPP33128DefinedCC` as specified in ETSI TS 102 232-7 V3.13.1 clause 15. See details in Annex 1 section 6.5.8. 5GC NR lawful interception HI4 Notification records specified in ETSI TS 133 128 V18.12.0 clause 5.6 are delivered via the parameter `HI4Payload` of the `LI-PS-PDU` module.	The delivery of the IRI and CC records specified in ETSI TS 133 128 V18.12.0 necessitates the use of the ASN.1 module `LI-PS-PDU` version 29 or a higher version. From ETSI TS 102 232-1 V3.34.1 and higher versions this document provides the ASN.1 schemas `HI2Operations` and `HI1NotificationOperations` as imports.
Annex J	**Implementation of Integrity Checks** The indicated typical values for hashTimeout, signTimeout, dataPduCount, hashPduCount shall be used for the implementation.	

Table 6-27: ETSI TS 102 232-1 V3.34.1 Handover specification for IP delivery

The supported ASN.1 Object identifiers and versions are stated in section 6.6

6.5.4 ETSI TS 102 232-2 V3.16.1 Service-specific details for messaging services

Clause ETSI TS 102 232-2 V3.16.1	Available options for Swiss applications	Additional requirements or specifications
6.2.3	**Email send IR**I IRI data according to table 1 for the event “Email send” must always be transferred.	
6.3.3	**Email receive IRI** IRI data according to table 2 for the event “Email receive” must always be transferred.	
6.4.3	**Email download IRI** IRI data according to table 3 for the event ”Email download” must always be transferred.	
7.10	**AAAInformation** This information is critical as email addresses themselves are not authenticated and it is easy for a user to spoof an email “from” address so it is important to be able to see which mailbox is being used to send emails.	AAAInformation is accepted in either the e-mail-login event, or in the transfer event (e-mail-send / receive / download / partial-download / upload), or in both. However the AAAInformation must not be missing from both the login and the transfer event.
8	**Unified Messaging events** The Unified Messaging (UM) systems operate often with proprietary functions that are not standardised. Therefore, PTSS shall determine based on consultations with the CSP which and how Unified Messaging related events and Messaging-Status shall be provided.	PTSS shall determine based on consultations with the CSP if the “raw” IRI event generated by the Unified Messaging system can be used.
8.1	**Delivery of CC** With regard to NOTE 2: If a target's terminal and UM box are both intercepted, the duplication of the interceptions is allowed.	
8.2	**Messaging events** The Messaging-Event structure is used to indicate that a message is manipulated within the UM system.	PTSS shall determine based on consultations with the CSP which Messaging events are supported by the UM system and can be delivered in the IRI records.
8.3	**Messaging box events** The Messaging-Box-Event structure is used to signal operations on the target's message box.	PTSS shall determine based on consultations with the CSP which Messaging box events are supported by the UM system and can be delivered in the IRI records.

Clause ETSI TS 102 232-2 V3.16.1	Available options for Swiss applications	Additional requirements or specifications
8.4	**Messaging notification events** The Messaging-Notification-Event structure is used to signal the LEA that a notification was sent to the target.	PTSS shall determine based on consultations with the CSP which Messaging notification events are supported by the UM system and can be delivered in the IRI records.
8.5	**Messaging call events** If the UM system set up a call with the sender of a messaging event, the `Messaging-Call-Event` parameter `callout` shall be delivered as IRI record.	
8.6	**Signalling of party information**	PTSS shall determine based on consultations with the CSP which Messaging-Trigger are supported by the UM system and can be delivered in the IRI records.
8.7	**Messaging properties** The Messaging-Property structure is used to signal additional information about a certain Messaging event.	CSP and PTSS shall specify bilaterally which properties can be signalled by the UM system and can be delivered in the IRI records.
Annex A Annex B Annex C Annex D	**SMTP** **POP3** **IMAP** **Messaging ASN.1**	The quick reference table in section 6.5.4.2 provides a detailed representation of the ASN.1 parameters to be delivered for the different protocols and events.

Table 6-28: ETSI TS 102 232-2 V3.16.1 Service-specific details for messaging services

The supported ASN.1 Object identifiers and versions are stated in section 6.6

6.5.4.1 Splitting of large email

ETSI TS 102 232-2 V3.16.1 does not specify a method for dealing with large volumes of content emails. PTSS set the following requirements: Large emails over 2MB must be split into multiple PDUs with a payload content of no more than 2MB each. Fragmented emails must be delivered according to the method specified in ETSI TS 102 232-1 V3.34.1 clause 6.2.4 with the corresponding TRI messages in the correct order with the correct sequence numbers so that they can be re-assembled at the LEMF.

6.5.4.2 Parameters quick reference table for email interception

			(1) e-mail-send	(2) e-mail-receive	(3) e-mail-download	(4) e-mail-logon-attempt	(5) e-mail-logon	(6) e-mail-logon-failure	(7) e-mail-logoff	(8) e-mail-partial-download	(9) e-mail-upload
PDUs expected	HI2		Y	Y	Y	optional	Y	optional	Y	Y	Y
	HI3		Y	Y	Y	optional	Y	optional	Y	Y	Y
Protocol-IDs used by each event type	Protocol-ID		smtp	smtp	pop3 imap4 undefined	smtp pop3 imap4 undefined	smtp pop3 imap4 undefined	smtp pop3 imap4 undefined	smtp pop3 imap4 undefined	pop3 imap4 undefined	imap4 undefined
102 232-1 Header Elements	pSHeader	li-psDomainId	■	■	■	■	■	■	■	■	■
		lawfulInterceptionIdentifier	■	■	■	■	■	■	■	■	■
		authorizationCountryCode ("CH")	■	■	■	■	■	■	■	■	■
		communicationIdentifier	■	■	■	■	■	■	■	■	■
		networkIdentifier	■	■	■	■	■	■	■	■	■
		operatorIdentifier	■	■	■	■	■	■	■	■	■
		networkElementIdentifier	■	■	■	■	■	■	■	■	■
		communicationIdentityNumber	■	■	■	■	■	■	■	■	■
		deliveryCountryCode ("CH")	■	■	■	■	■	■	■	■	■
		sequenceNumber	■	■	■	■	■	■	■	■	■
		timeStamp	■	■	■	■	■	■	■	■	■
102 232-1/2 payload Field Requirements (IRI)	payload	iRIPayloadSequence	■	■	■	■	■	■	■	■	■
		iRIPayload	■	■	■	■	■	■	■	■	■
		iRIType	■	■	■	■	■	■	■	■	■
		timeStamp	■	■	■	■	■	■	■	■	■
		iRIContents	■	■	■	■	■	■	■	■	■
		emailIRI	■	■	■	■	■	■	■	■	■
		emailIRIObjId	■	■	■	■	■	■	■	■	■
		eventType	■	■	■	■	■	■	■	■	■
		client-Address	□	□	□	□	□	□	□	□	□
		server-Address	□	□	□	□	□	□	□	□	□
		client-Port	□	□	□	□	□	□	□	□	□
		server-Port	□	□	□	□	□	□	□	□	□
		server-Octets-Sent	■	■	■	■	■	■	■	■	■
		client-Octets-Sent	■	■	■	■	■	■	■	■	■
		protocol-ID	■	■	■	■	■	■	■	■	■
		e-mail-Sender	■	■	□	⊗	⊗	⊗	⊗	□	□
		e-mail-Recipients	■	■	□	⊗	⊗	⊗	⊗	□	□
		status	■	■	■	■	■	■	■	■	■
		total-Recipient-Count	■	■	■	⊗	⊗	⊗	⊗	■	■
		message-ID	□	□	□	⊗	⊗	⊗	⊗	□	□
		nationalParameter	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
		national-EM-ASN1parameters	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
		aAAInformation	□	□	□	□	□	□	□	□	□
		e-mail-Sender-Validity	□	□	□	□	□	□	□	□	□
102 232-1/2 payload Field Requirements (CC)	payload	cCPayloadSequence	■	■	■	■	■	■	■	■	■
		CCPayload	■	■	■	■	■	■	■	■	■
		payloadDirection	■	■	■	■	■	■	■	■	■
		timeStamp	□	□	□	□	□	□	□	□	□
		cCContents	■	■	■	■	■	■	■	■	■
		emailCC	■	■	■	■	■	■	■	■	■
		emailCCObjId	■	■	■	■	■	■	■	■	■
		email-Format	■	■	■	■	■	■	■	■	■
		content	■	■	■	■	■	■	■	■	■
Data source for calculating octet counters	IP Packet Interception	clientOctets-sent	protocol messages from client to server + email message	protocol messages from client to server + email message	protocol messages from client to server	protocol messages from client to server	protocol messages from client to server	protocol messages from client to server	protocol messages from client to server	protocol messages from client to server	protocol messages from client to server + email message
		serverOctets-sent	protocol messages from server to client	protocol messages from server to client	protocol messages from client to server + email message	protocol messages from server to client	protocol messages from server to client	protocol messages from server to client	protocol messages from server to client	protocol messages from client to server + email message	protocol messages from server to client
	Application Interception	clientOctets-sent	email message	email message	zero	zero	zero	zero	zero	zero	email message
		serverOctets-sent	zero	zero	email message	zero	zero	zero	zero	email message	zero

Key: ■ = Mandatory, □ = Mandatory if available, ⊗ = Not applicable / do not supply

Table 6-29: ETSI TS 102 232-2 V3.16.1 parameters quick reference table

6.5.5 ETSI TS 102 232-3 V3.16.1 Service-specific details for internet access services

Clause ETSI TS 102 232-3 V3.16.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
4.3.1	**Target identity** See Annex 1 section 5	When a cable modem identifier is used for intercepting internet cable access, the modem move must be considered.
5.1.1	**Dial Up Access** This type of Internet access is not covered by this section.	
6.1	**IRI events** The IRI events and IRI message types described in Table 1 shall be used.	In Switzerland a new CIN value is allocated on the `accessAttempt` IRI-REPORT as specified in the Figure 6 of this clause.
6.2.0	**List of HI2 attributes** The HI2 IRI attributes shall be delivered as listed in Table 2. With regard to the NOTE 2, the user's password shall not be delivered in the `rawAAAData` attribute.	
6.2.2	**Use of location field** The common parameter `Location` from ETSI TS 102 232-1 V3.34.1 clause 4.5 can be used to deliver the target's location information, when available.	If a CPE provides location information, it may be handed over in the `cPEProvidedLocationAttributes` parameter as defined in ETSI TS 102 232-1 V3.34.1 `LI-PS-PDU` ASN.1 schema.
6.2.3	**Packet Data Header Reporting (PDHR)** The PDHR method is not used in Switzerland.	
6.2.4	**Packet Data Summary Reporting (PDSR)** The PDSR method is not used in Switzerland.	
7.2A	**HI3 truncated attributes** When PTSS explicitly requires the delivery of truncated IP datagram, the CSP shall deliver only a specified number of the first octets of all the intercepted IP datagrams. The `IPTruncatedPacket` structure of the `IPAccessPDU` ASN.1 schema shall be used.	The delivery of the `originalLength` attribute is optional.

Table 6-30: ETSI TS 102 232-3 V3.16.1 Service-specific details for internet access services

The supported ASN.1 Object identifiers and versions are stated in section 6.6

6.5.6 ETSI TS 102 232-5 V3.21.1 Service-specific details for IP Multimedia Services

Clause ETSI TS 102 232-5 V3.21.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
4.3	**General Requirements** 3) Generally, copies of signalling information (e.g., SIP messages) are transferred as IRI data. 5) IRI data that is not part of the signal must be transferred as well. 6) No national option is mandated.	The documentation of the VoIP provider must explain the parameters and/or message combinations used for the various services (e.g., basic call, call forwarding) at the use of examples. Services that are controlled by end devices (clients) of subscribers must be described – if known – with regard to changes to signalling or RTP streams (e.g., simultaneous RTP streams in the case of conferences). Module 'HI2Operations' described in ETSI TS 101 671 V3.12.1 Annex D.5 must be used for handing over IRI data. A separate parameter may be used for SIP messages. The module itself should be transmitted in accordance with the requirements of ETSI TS 102 232-1 V3.34.1 Annex A.2
5.2.6	**SIP Messages in IRI-only intercept** If the CSP removes the content element in the TP-User-Data of a SMS conveyed with the SIP MESSAGE method, the CSP must indicate the removal of the content by using the `iRIOnlySIPMessage` parameter.	
5.2.7	**Signalling IP address information** The source or destination IP addresses shall not be substituted with other IP addresses of the Signalling Server or any other element.	
5.3	**Assigning a value to the CIN** Generally, for new sessions, the CIN is assigned at the first IRI or CC information. If a session already exists at the time of activation of an interception measure, the CIN must be generated at the first IRI or CC message.	If a connection already exists at the time of activation of an interception measure, a copy of IRI and CC data must be captured and provided starting from the point in time when the first IRI event is detected.

Clause ETSI TS 102 232-5 V3.21.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
5.3.1	**Assigning a CIN value to SIP related IRI** The description assumes the use of the Call ID and the „o" field of the SDP for generating a single CIN for the entire call when one SIP dialog exists. The P-Charging-Vector SIP header could also be used to generate a single CIN when several SIP dialogs are involved in the call session.	Despite of the known ETSI issue with multiple CIN, the generation of a single CIN for the various individual communication sessions is still an objective.
5.3.3	**Assigning a CIN value to XCAP related IRI** The IRI events containing the HTTP request and the associated HTTP response for an XCAP transaction shall be assigned the same value for the CIN.	
5.4	**Events and IRI record types** The delivered IRI Record Types for Multimedia events shall follow the specifications of Table 1. In case of problems, delayed events may need to be reported after a communication session has already ended. These events are reported as IRI-REPORT with the same CIN value that was used for the corresponding communication session.	In Switzerland all Multimedia events delivered with this specification can be of type IRI-REPORT.
5.5	**Interception of Content of Communication** At the point of handover the call or session (e.g., VoIP, MSRP) provider must remove any service coding and/or encryption that have been applied to the data on his part. This includes any proprietary encodings.	The delivered Content of Communication shall contain the transport protocol (e.g., UDP, TCP, SCTP) header and IP header. The `FrameType` and the `MMCCprotocol` parameters shall be provided. This requirement also applies if the provider supports peer-to-peer communication by providing the key while the encryption itself is performed outside the provider's network.
5.6	**Direction for IMS IRI for Signalling Messages** The direction of the IMS based IRI records shall not be provided.	

Clause ETSI TS 102 232-5 V3.21.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
5.7	**Direction for IMS sessions** The direction for IMS sessions shall be provided by the means of the `sessionDirection` parameter in ETSI TS 102 232-1 V3.34.1. The parameters `combined` and `notapplicable` shall not be used.	
5.8	**Correlation of signalling and media** Signalling (SIP) and media (RTP) shall be intercepted in the same context in order to ensure a proper correlation between the SDP attributes (e.g., c=, m= and a= lines) and the RTP header, IP address, protocol port and codec.	

Table 6-31: ETSI TS 102 232-5 V3.21.1 Service-specific details for IP Multimedia Services

The supported ASN.1 Object identifiers and versions are stated in section 6.6.

6.5.7 ETSI TS 102 232-6 V3.5.1 Service-specific details for PSTN/ISDN services

Clause ETSI TS 102 232-6 V3.5.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications

5.2	**Structures**
	IRI is encoded with module HI2Operations (version 18) according to ETSI TS 101 671 V3.12.1 Annex D.5 and transferred directly by ETSI TS 102 232-1 V3.34.1 Annex A.2 and ETSI TS 102 232-6 V3.5.1 via the parameters ETSI671IRI and iRIsContent such as:
	`PS-PDU`
	`  payload`
	`  iRIPayloadSequence`
	`  iRIPayload`
	`  iRIContents`
	`  eTSI671IRI`
	`  iRIsContent`
	`  iRIContent`
		When using the structure ETSI671IRI the `lawfulInterceptionIdentifier` (LIID) and the `operator-Identifier` (OPID) shall be identical in the ETSI TS 101 671 V3.12.1 IRI record and in the ETSI TS 102 232-1 V3.34.1 `LI-PS-PDU PSHeader` sequence.
		
		The IRI type shall be identical in the ETSI TS 101 671 V3.12.1 IRI record and in the ETSI TS 102 232-1 V3.34.1 `LI-PS-PDU IRIPayload` sequence.

Clause ETSI TS 102 232-6 V3.5.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
6.2	**CC format** If the interception is performed in the ISDN or ISUP domain (Circuit switched): The copy of the content of communication (CC) is delivered as audioFrame via the parameter PstnIsdnCC. If the interception is performed in the IP domain (Packet switched): The copy of the content of communication (CC) is delivered as RTP packets with UDP and IP headers by ETSI TS 102 232-1 V3.34.1 via the parameter PstnIsdnCC. If the UDP and IP headers are missing from the intercepted content, the `frameType` structure can be used to deliver the `applicationFrame`. The information required for interpreting the audioFrame or RTP packets are also transferred by ETSI TS 102 232-1 V3.34.1 via the parameter PstnIsdnIRI. At the point of handover the CSP must remove any service coding and/or encryption that have been applied to the data on his part.	CSP shall not transcode the intercepted voice content of communication before delivering it to PTSS. This requirement also applies if the provider supports peer-to-peer communication by providing the key while the encryption itself is performed outside the provider's network.
6.3.2	**Supplementary information** When necessary, the `supplementaryInfo` shall be delivered in the `PstnIsdnCC` structure.	

Table 6-32: ETSI TS 102 232-6 V3.5.1 Service-specific details for PSTN/ISDN services

The supported ASN.1 Object identifiers and versions are stated in section 6.6.

6.5.8 ETSI TS 102 232-7 V3.13.1 Service-specific details for Mobile Services

This technical specification uses the handover techniques and ASN.1 syntax defined in ETSI TS 102 232-1 V3.34.1.
ETSI TS 102 232-7 V3.13.1 is used only for:

a) the delivery of the IRI and CC records from 5GS specified in ETSI TS 133 128 V18.12.0 for the 5GS events.
b) the delivery of the IRI and CC records from EPS when EPS/5GS interworking via combined nodes (SMF+PGW-C and UPF-PGW-U as described in 3GPP TS 23.501 V18.10.0 clause 4.3) is used and encoded as ETSI TS 133 128 V18.12.0 clauses 6.3.1, 6.3.2.3.2, 6.3.3.4 and 6.3.3.5 (Option A).

Clause ETSI TS 102 232-7 V3.13.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
15.1	**Definition of IRI events and CC** IRI and CC events are defined as per ETSI TS 133 128 V18.12.0	See details in Annex 1 section 6.5.9.
15.2	**IRI and CC format** ETSI TS 133 128 V18.12.0 defines the format for the contents of the `threeGPP33128DefinedIRI` and `threeGPP33128DefinedCC` elements for each IRI and CC event.	The IRI and CC records are delivered with the transport mechanism specified in ETSI TS 102 232-1 V3.34.1 in section 6.5.3. The IRI and CC records shall be delivered to PTSS on different protocol ports. PTSS provides the protocol port numbers to each CSP.
15.3	**Network Function Identifier** If the Network Function Identifier (NFID) parameter is available on the LI_X2 and LI_X3 interfaces, it shall be delivered to the LEMF in the `networkFunctionIdentifier` parameter of the PSHeader of ETSI TS 102 232-1 V3.34.1.	
15.4	**Extended Interception Point Identifier** If the Interception Point Identifier (IPID) parameter is available on the LI_X2 and LI_X3 interfaces, it shall be delivered to the LEMF in the `extendedInterceptionPointID` parameter of the PSHeader of ETSI TS 102 232-1 V3.34.1.	

Table 6-33: ETSI TS 102 232-7 V3.13.1 Service-specific details for Mobile Services

6.5.9 ETSI TS 133 128 V18.12.0 Protocol and procedures for Lawful Interception for 5G System

The handover interface specifications of ETSI TS 133 128 V18.12.0 are based on the description from the specification ETSI TS 133 127 V18.12.0 Lawful interception architecture and functions for the 5G System.

The architecture and concepts of the 5G System are specified in 3GPP TS 23.501 V18.10.0 and the procedures in 3GPP TS 23.502 V18.10.0. The security architecture and procedures are specified in 3GPP TS 33.501 V18.10.0.

This handover interfaces for the 3GPP-defined services provided by the 5G System uses the transport mechanisms specified in ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-7 V3.13.1. See details in the sections 6.5.3 and 6.5.8.

Note: The technical specification ETSI TS 133 128 V18.12.0 specifies also the protocols and messages of the CSP internal interfaces.

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
4.General		
4.2	**Basic principles for internal interfaces** The protocols of the internal interfaces listed in the Table 4.2-1 are under the control of the CSP and out of scope of the present document.	
4.3	**Basic principles for external handover interfaces** Implementation of the external handover LI_HI1 requires the use of ETSI TS 103 120 V1.9.1 with the new 5GS identifiers. See also section 4.2.3 in the present document.	The IP addresses and protocol ports to be used for each external handover interface is determined from PTSS based on consultations with the CSP. The 5-Tuple of each external handover interface (LI_HI1, LI_HI2, LI_HI3, LI_HI4) may be different.
4.4.2	**CSP service type** The listed service types shall be implemented by the CSP in a way that conforms to the VÜPF real-time instructions type requirements.	Depending on the CSP operated services: - RT_22_NA_IRI and RT_23_NA_IRI_CC may be composed of the “Data” service type. - RT_24_TEL_IRI and RT_25_TEL_IRI_CC may be composed of the “Voice”, Messaging”, “Push-to-Talk” and RCS service types. - RT_54_POS_ONCE and RT_55_POS_PERIOD and EP_56_POS_ONCE and EP_57_POS_PERIOD may be composed of the LALS service type.
4.4.3	**Delivery type** Only the IRI, IRI and CC delivery types shall be supported in Switzerland.	
4.4.4	**Location Reporting** The LIPF location reporting types are not used in Switzerland.	Every target location information occurrence in a POI shall be reported.

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
4.4.5	**LALS Triggering** Only LALS positioning is used in Switzerland. The LALS triggering function shall not be used.	
4.4.6	**Roaming interception**	Interception shall not stop when the target is roaming outbound internationally.
5. Transport and Communications Protocol		
5.2	**Protocols for LI_X1 and LI_T interfaces** These internal interfaces are under the control of the CSP and the protocols to be used are out of scope of the present document.	
5.3	**Protocols for LI_X2 and LI_X3** These internal interfaces are under the control of the CSP and the protocols to be used are out of scope of the present document.	
5.4	**Protocols for LI_HI1** The XML specified in ETSI TS 103 120 V1.9.1.	For the requirements of ETSI TS 103 120 V1.9.1 refer to the present document in sections 4.2.2, 4.2.3 and 4.3.3.
5.4.1	**General** In Table 5.4.1-1 the field TimeSpan does not need an EndTime in the LITaskObject. In Table 5.4.1-2 the field ServiceType is not used.	
5.4.2	**Service scoping** Service scoping is not used in Switzerland.	
5.4.3	**Location Acquisition** Location acquisition is not used in Switzerland. The LALS method is used instead.	
5.5	**Protocols for LI_HI2 and LI_HI3** The functions having LI_HI2 or LI_HI3 interface shall support the use of ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-7 V3.13.1.	For the requirements of ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-7 V3.13.1 refer to the present document in sections 6.5.3 and 6.5.8. In Table 5.5.2-2 the field targetIdentifiers is mandatory and must be populated as specified in ETSI TS 133 128 V18.12.0 clause 5.5.5.

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
5.6	**Protocols for LI_HI4** The functions having LI_HI4 interface shall support the use of the `hI4Payload` sequence of ETSI TS 102 232-1 V3.34.1.	Notification parameters to be delivered are detailed in the Annex B of this table.
5.7	**Protocols for LI_HIQR** The LI_HIQR external interface between PTSS and CSP shall be supported and is specified in this Annex 1 document in section 8.4.12 and 8.5.2.	
5.8	**Protocols for LI_XQR** The protocols of the LI_XQR internal interface is under the control of the CSP and is out of scope of the present document.	
5.9	**Protocols for LI_XER** The protocols of the LI_XER internal interface is under the control of the CSP and is out of scope of the present document.	
5.10	**Protocols for LI_ST** The protocols of the LI_ST internal interface is under the control of the CSP and is out of scope of the present document.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
6.Network Layer Based Interception Field names and descriptions are valid for internal xIRI and external IRI records as well as internal xCC and external CC data.		
6.2.2.3	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `AMFRegistration`, `AMFDeregistration`, `AMFLocationUpdate`, `AMFStartOfInterceptionWithRegisteredUE`, `AMFUnsuccessfulProcedure`, `AMFIdentifierAssociation`, `AMFIdentifierDeassociation`, `AMFPositioningInfoTransfer`, `AMFRANHandoverCommand`, `AMFRANHandoverRequest`, `AMFUEConfigurationUpdate`, `AMFRANTraceReport`, `AMFUEPolicyTransfer`, `AMFUEServiceAccept` The IRI records shall be enriched with additional information available at the MDF. For instance with the `CellSiteInformation` such as the cell's geographical coordinates and azimuth.	`AMFLocationUpdate` shall be delivered when the AMF Location service detects a new location or positioning information in the ProvideLocInfo, ProvidePosInfo, NotifiedPosInfo and EventNotify service. And when the AMF Exposure service detects an AMFEventReport with LOCATION_REPORT. And when the target invokes mobile originated LCS service.
6.2.2.4	**Identity privacy** The AMF shall maintain the SUPI to SUCI mapping for at least the lifetime of the registration in order to allow interception based on the SUPI after the initial registration.	
6.2.2A	**Identifier Reporting for AMF** The protocols and events use internal interfaces that are under the control of the CSP and are out of scope of the present document.	
6.2.3.3.2	**CC interception with multi-homed PDU session** The ability to intercept all user plane packets takes precedence over the avoiding of the duplicate delivery of the CC. However, the duplicate delivery of CC must be suppressed to the extent possible.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
6.2.3.5.1 6.2.3.5.2 6.2.3.5.3 6.2.3.5.4	**Packet data header reporting** Packet Data Header Reports (PDHR) and Packet Data Header Summary Reports (PDSR) are not required.	

6.2.3.7	**Generation of IRI over LI_HI2**
	IRI BEGIN shall be generated based on the xIRI record payload for:
	`SMFPDUSessionEstablishment`,
	`SMFStartOfInterceptionWithEstablishedPDUSession`,
	`SMFMAPDUSessionEstablishment`
	`SMFStartOfInterceptionWithEstablishedMAPDUSession`
	
	IRI CONTINUE shall be generated based on the xIRI record payload for:
	`SMFPDUSessionModification`,
	`SMFMAPDUSessionModification`,
	`SMFPDUtoMAPDUSessionModification`
	
	IRI END shall be generated based on the xIRI record payload for:
	`SMFPDUSessionRelease`,
	`SMFMAPDUSessionRelease`
	
	IRI REPORT shall be generated based on the xIRI record payload for:
	`SMFUnsuccessfulProcedure`,
	`SMFMAUnsuccessfulProcedure`	

6.2.3.8	**Generation of CC over LI_HI3**
	The CSP shall deliver only the IP content in the CC records without the GTP-U header. Using the ASN.1 structure:
	`ExtendedUPFCCPDU ::= SEQUENCE {`
	`payload [1] UPFCCPDUPayload,`
	`qFI [2] QFI OPTIONAL`
	`}`
	
	The `UPFCCPDUPayload` field shall be populated as specified in Table 6.2.3-16.
		The `uPFCCPDU` with the GTP-U shall not be used.

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
6.2.3.9	**Packet header information reporting** Packet Data Header Reporting (PDHR) and Packet Data Summary Reporting (PDSR) are not used in Switzerland.	
6.2.4	**LI at UDM for 5G** The UDM shall have LI capabilities. Refer to ETSI TS 133 128 V18.12.0 clause 7.2.2.	
6.2.5	**LI at SMSF** The SMSF shall have LI capabilities. Service scoping is not used in Switzerland.	
6.2.5.4	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for 5GS based SMS-MO and SMS-MT cases: `SMSMessage`, `SMSReport`	
6.3.1	**4G** In case of EPC/5GS interworking via via combined SMF+PGW-C and UPF+PGW-U the Option A shall be used.	EPC/5GC interworking is specified in 3GPP TS 23.501 V18.10.0 clause 4.3. When PTSS and CSP operate 3GPP Release 18 Lawful Interception network capabilities, PTSS shall determine based on consultations with the CSP, if Option A shall be used for the delivery of EPS-based 4G IRI and CC records for implementations that do not include EPS/5GS interworking.

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
6.3.2.3	**Generation of IRI over LI_HI2** Option A is supported, IRI REPORT shall be generated based on the xIRI record payload for: `MMEAttach`, `MMEDetach`, `MMELocationUpdate`, `MMEStartOfInterceptionWithEPSAttachedUE`, `MMEUnsuccessfulProcedure`, `MMEIdentifierAssociation`, `MMEIdentifierDeassociation`, `MMEPositioningInfoTransfer`, `EPSRANHandoverCommand`, `EPSRANHandoverRequest`, `MMERANTraceReport`, `MMEUEServiceAccept` The IRI records shall be enriched with additional information available at the MDF. For instance with the `CellSiteInformation` such as the cell's geographical coordinates and azimuth.	
6.3.3.4	**Generation of IRI over LI_HI2** Option A is used the IRI records from the SGW/PGW and ePDG shall be encoded according to the xIRI specified in ETSI TS 133 128 V18.12.0 clause 6.3.3.2 and delivered via the LI_HI2 handover interface according to ETSI TS 102 232-7 V3.13.1 clause 15.2.	For Option A (EPS/5GS interworking) refer also to the present document section 6.5.8.
6.3.3.4.1	**General** Option A shall be used. LI_HI2 is realised as specified in ETSI TS 133 128 V18.12.0 clause 6.3.3.4.2.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
6.3.3.4.2	**Option A** IRI BEGIN shall be generated based on the xIRI record payload for: `EPSPDNConnectionEstablishment`, `EPSStartOfInterceptionWithEstablishedPDNConnection`, IRI CONTINUE shall be generated based on the xIRI record payload for: `EPSPDNConnectionModification` IRI END shall be generated based on the xIRI record payload for: `EPSPDNConnectionRelease` IRI CONTINUE shall be generated based on the xIRI record payload for: `EPSPDNConnectionRelease`	
6.3.3.5	**Generation of CC over LI_HI3** Option A is used the CC records from the SGW/PGW and ePDG shall be encoded according to the xCC specified in ETSI TS 133 128 V18.12.0 clause 6.3.3.3 and delivered via the LI_HI3 handover interface according to ETSI TS 102 232-7 V3.13.1 clause 15.2.	For Option A (EPS/5GS interworking) refer also to the present document section 6.5.8.
7. Service Layer Based Interception		
7.2.2	**LI at UDM** The UDM provides the unified data management for UE and shall have LI capabilities.	
7.2.2.3.2	**Serving system** If the target is registered simultaneously in the same PLMN with 3GPP and Non-3GPP accesses, two different IRI records shall be delivered, one for each type of access. This information is delivered with the `UDMServingSystemMessage` sequence.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.2.2.4	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `UDMServingSystemMessage`, `UDMSubscriberRecordChangeMessage`, `UDMCancelLocationMessage`, `UDMLocationInformationResult`, `UDMUEInformationResponse`, `UDMUEAuthenticationResponse`, `UDMStartOfInterceptionWithRegisteredTarget`, `UDMProSeTargetIdentifierDeconcealment`, `UDMProSeTargetAuthentication`	
7.2.3.1	**LI at HSS** Option 1 shall be used.	
7.2.3.4	**Generation of IRI over LI_HI2** Option 1 shall be used for the delivery of IRI records from the HSS, encoded according to ETSI TS 133 128 V18.12.0 and delivered via the LI_HI2 handover interface. IRI REPORT shall be generated based on the xIRI record payload for: `hSSServingSystemMessage`, `hSSStartOfInterceptionWithRegisteredTarget`	For Option 1 (EPS/5GS interworking) refer also to the present document section 6.5.8.
7.3.1	**Lawful Access Location Services (LALS)** LALS provides lawful access to the target's location. LALS is based on the Location Services (LCS) capabilities defined in 3GPP TS 23.271 V18.0.0, 3GPP TS 23.273 V18.10.0 and in OMA-TS-MLP-V3_5-20181211-C.	The subscriber location privacy settings shall be overridden for LALS by setting the privacy override indicator to "override" in the LI LCS client profile in the GMLC.

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.3.1.2.1	**Target positioning service** The QoS parameter shall not be used in the LALS instruction. The TaskDetailsExtensions shall be interpreted as follows: The PositioningServiceType: - "immediate" corresponds to the instruction "RT_54_POS_ONCE" or "EP_56_POS_ONCE". - "periodic" corresponds to the instruction "RT_55_POS_PERIOD" or "EP_57_POS_PERIOD" The PositioningPeriodicity type shall be set at a time interval of 900 seconds. The OMA-TS-MLP-V3_5-20181211-C based Positioning Parameters shall be set as: - requested location type: CURRENT - requested response type: SYNC - max location age: 3600 - response timing required: DELAY_TOL - response timer: 60 - horizontal accuracy with QoS class: not used - altitude accuracy with QoS class: not used - motion state request: not used	
7.3.1.2.2	**Triggered location service** The triggered location service is not used in Switzerland.	
7.3.1.5	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload as specified in the table 7.3.1.4-1 for: `LALSReport`	The ASN.1 structure for the delivery of the positioning information for 5GS is specified in the section 6.3.8.3.2 of the present document.

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.3.2.2	**Delivery of cell site information over LI_HI2** If the MDF2 complement all the IRI records containing a 3GPP access location with the cell site information (geographical coordinates and azimuth), then the delivery of `MDFCellSiteReport` message is not required.	
7.3.3	**Use of the Location structure** The reference datum used for a latitude and longitude given in the GeographicalCoordinates shall be identified in the `mapDatumInformation` field and specified as an Open Geospatial Consortium URN.	The WGS84 reference datum shall be used with the OGC URN: `urn:ogc:def:crs:OGC:1.3:CRS84`
7.3.3.2.60	**Type: SIPLocationInfo** In Table 7.3.3.2.60-1 the field `cellInformation` is not used. The cell site information with the geocoordinates shall be delivered in the `cellSiteInformation` field in the `locationInfo` structure.	The ASN.1 structures are specified in the sections 6.3.9.4 and 6.3.10.2 of the present document.
7.3.4	**Separated location reporting** IRI REPORT can be generated based on the xIRI record payload as specified in the table 7.3.4.1-1 for: `SeparatedLocationReporting`	
7.3.5	**Location acquisition** The location acquisition method is not used in Switzerland.	
7.3.6	**Location Only Reporting** The location only reporting is supported.	
7.4.2	**LI at the MMS Proxy-Relay** If the intercepted messages do not comply fully, or the version is other than OMA-TS-MMS_ENC-V1_3-20110913-A, parameters are required to be provided only if available.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.4.4.1	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `MMSSend`, `MMSSendByNonLocalTarget`, `MMSNotification`, `MMSSendToNonLocalTarget`, `MMSNotificationResponse`, `MMSRetrieval`, `MMSDeliveryAck`, `MMSForward`, `MMSDeleteFromRelay`, `MMSMBoxStore`, `MMSMBoxUpload`, `MMSMBoxDelete`, `MMSDeliveryReport`, `MMSDeliveryReportNonLocalTarget`, `MMSReadReport`, `MMSReadReportNonLocalTarget`, `MMSCancel`, `MMSMBoxViewRequest`, `MMSMBoxViewResponse`	
7.4.4.2	**Generation of CC over LI_HI3** CC message shall be generated based on the xCC record payload. `MMSCCPDU`	
7.5	**PTC service** Service description: The term PTC represents either a Push to Talk over Cellular (PoC) or Mission Critical Push to Talk (MCPTT) type service. The use of the term PTC server represents either a MCPTT function or PoC server.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.5.3.1	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `PTCRegistration`, `PTCSessionInitiation`, `PTCSessionAbandon`, `PTCSessionStart`, `PTCSessionEnd`, `PTCStartOfInterception`, `PTCPreEstablishedSession`, `PTCInstantPersonalAlert`, `PTCPartyJoin`, `PTCPartyDrop`, `PTCPartyHold`, `PTCMediaModification`, `PTCGroupAdvertisement`, `PTCFloorControl`, `PTCTargetPresence`, `PTCParticipantPresence`, `PTCListManagement`, `PTCAccessPolicy`	
7.5.3.2	**Generation of CC over LI_HI3** CC message shall be generated based on the xCC record payload: `PTCCCPDU`	
7.6	**Identifier Association Reporting** Service description: The ICF and IQF functions are under the control of the CSP and out of scope of the present document.	
7.6.2.2	**ICF receipt of records over LI_XER** The LI_XER internal interface is under the control of the CSP and out of scope of the present document.	
7.6.2.3	**ICF Query and Response over LI_XQR** The LI_XQR internal interface is under the control of the CSP and out of scope of the present document.	
7.6.3.2	**IQF Query and Response over LI_HIQR** The LI_HIQR external interface between PTSS and CSP shall be supported and is specified in the present document in sections 8.4.12 and 8.5.2.	
7.6.3.3	**IQF Query and Response over LI_XQR** The LI_XQR internal interface is under the control of the CSP and is out of scope of the present document.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.7.2	**LI for NIDD using NEF** Service description: NIDD (Non-IP Data Delivery) may be used to handle Mobile Originated (MO) and Mobile Terminated (MT) communication for unstructured data in non-roaming and roaming situations.	

7.7.2.3	**Generation of IRI over LI_HI2**
	IRI BEGIN shall be generated based on the xIRI record payload for:
	`NEFPDUSessionEstablishment`, `NEFStartOfInterceptionWithEstablishedPDUSession`
	
	IRI CONTIUNE shall be generated based on the xIRI record payload for:
	`NEFPDUSessionModification`
	
	IRI END shall be generated based on the xIRI record payload for:
	`NEFPDUSessionRelease`
	
	IRI REPORT shall be generated based on the xIRI record payload for:
	`NEFUnsuccessfulProcedure`	

7.7.2.4	**Generation of CC over LI_HI3** CC message shall be generated based on the xCC record payload. `NIDDCCPDU`	
7.7.3	**LI for device triggering** Service description: Device triggering is the means by which an AF sends information to the UE via the NEF to trigger the UE to perform application specific actions that include initiating communication with the AF.	
7.7.3.2	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `NEFDeviceTrigger`, `NEFDeviceTriggerReplace`, `NEFDeviceTriggerCancellation`, `NEFDeviceTriggerReportNotify`	
7.7.4	**LI for MSISDN-less MO SMS** Service description: A MSISDN-less MO SMS is sent by a UE without MSISDN as originator and received by a third party application function (AF) as destination via SMS-SC and NEF.	
7.7.4.2	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `NEFMSISDNLessMOSMS`	
7.7.5	**LI for parameter provisioning** Service description: Parameter provisioning is a capability exposed by NEF to AF. The AF can use this capability to tell the network when a device is expected to communicate.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.7.5.2	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `NEFExpectedUEBehaviorUpdate`	
7.7.6	**LI for AF session with QoS** Service description: AF session with QoS is a capability exposed by NEF to AF. The AF can use this capability to request the network to provide QoS for an AF session (i.e. data session to a target UE that is served by a 3rd party service provider) based on the application and service requirements.	
7.7.6.2	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `NEFAFSessionWithQoSProvision`, `NEFAFSessionWithQoSNotification`	
7.8.2	**LI for NIDD at SCEF** Service description: NIDD (Non-IP Data Delivery) may be used to handle Mobile Originated (MO) and Mobile Terminated (MT) communication for unstructured data in non-roaming and roaming situations.	

7.8.2.3	**Generation of IRI over LI_HI2**
	IRI BEGIN shall be generated based on the xIRI record payload for:
	`SCEFPDNConnectionEstablishment`,
	`SCEFStartOfInterceptionWithEstablishedPDNConnection`
	
	IRI CONTINUE shall be generated based on the xIRI record payload for:
	`SCEFPDNConnectionUpdate`
	
	IRI END shall be generated based on the xIRI record payload for:
	`SCEFPDNConnectionRelease`
	
	IRI REPORT shall be generated based on the xIRI record payload for:
	`SCEFUnsuccessfulProcedure`	

7.8.2.4	**Generation of CC over LI_HI3** CC message shall be generated based on the xCC record payload: `NIDDCCPDU`	
7.8.3	**LI for device triggering** Service description: Device triggering is the means by which an SCS/AS sends information to the UE via the SCEF to trigger the UE to perform application specific actions that include initiating communication with the SCS/AS.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.8.3.2	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `SCEFDeviceTrigger`, `SCEFDeviceTriggerReplace`, `SCEFDeviceTriggerCancellation`, `SCEFDeviceTriggerReportNotify`	
7.8.4	**LI for MSISDN-less MO SMS** Service description: A MSISDN-less MO SMS is sent by a UE without MSISDN as originator and received by a third-party application as destination via SMS-SC and SCEF.	
7.8.4.2	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `SCEFMSISDNLessMOSMS`	
7.8.5	**LI for parameter provisioning** Service description: Parameter provisioning is a capability exposed by SCEF to SCS/AS. The SCS/AS can use this capability to tell the network when a device is expected to communicate.	
7.8.5.2	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `SCEFCommunicationPatternUpdate`	
7.8.6	**LI for AS session with QoS** Service description: AS session with QoS is a capability exposed by SCEF to SCS/AS. The SCS/AS can use this capability to request the network to provide QoS for an AS session (i.e. data session to a target UE that is served by a 3rd party service provider) based on the application and service requirements.	
7.8.6.2	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `SCEFASSessionWithQoSProvision`, `SCEFASSessionWithQoSNotification`	
7.9.1	**LI for general AKMA-based service** Service description: 3GPP frameworks for encrypting application layer traffic based on cryptographic keys derived from the USIM.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications

7.9.1.5	**Generation of IRI over LI_HI2**
	xIRI records to form the IRI records can be generated by two different nodes, the AF or the AAnF.
	
	IRI BEGIN shall be generated based on the xIRI record payload for:
	`AAnFAnchorKeyRegister`,
	`AAnFStartOfInterceptWithEstablishedAKMAKeyMaterial`,
	`AFStartOfInterceptWithEstablishedAKMAApplicationKey`
	
	IRI CONTINUE shall be generated based on the xIRI record payload for:
	`AAnFKAKMAApplicationKeyGet`,
	`AFAKMAApplicationKeyRefresh`,
	`AFAuxiliarySecurityParameterEstablishment`
	
	IRI END shall be generated based on the xIRI record payload for:
	`AAnFAKMAContextRemovalRecord`
	`AFApplicationKeyRemoval`	

7.10	**LI in VPLMN for IMS-based services with home-routed roaming** Service description: With home-routed roaming architecture, all the IMS Signalling Functions and IMS Media Functions reside in the HPLMN. The LI capabilities provided in the VPLMN with home-routed roaming architecture shall be to the same extent as the LI capabilities provided in the VPLMN with LBO approach as the roaming architecture.	
7.10.3	**HR LI Phase 1** The functions and internal interfaces are under the control of the CSP and out of scope of the present document.	
7.10.4	**HR LI Phase 2** The Phase-2 of HR LI applies to inbound roaming target UEs that use IMS-based services with home-routed roaming or the inbound roaming UEs that use IMS-based services with home-routed roaming to communicate with the target non-local ID.	
7.10.4.9	**Generation of IRI over LI_HI2** IRI records shall be generated based on the xIRI records payload received from the LMISF-IRI over the LI_X2 interface.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.10.4.10	**Generation of CC over LI_HI3** CC records shall be generated based on the xCC records payload received from the LMISF-CC over the LI_X3 interface.	
7.11	**STIR/SHAKEN and RCD/eCNAM** Service description: STIR provides the ability within SIP to authenticate caller ID, and SHAKEN defines the end-to-end architecture to implement caller ID authentication using STIR in the telephone network. RCD is inserted in the SIP Identity header token and is digitally signed. eCNAM provides the terminating user with a name that identifies the originating user.	
7.11.3	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `STIRSHAKENSignatureGeneration`, `STIRSHAKENSignatureValidation`	
7.12	**LI for IMS based services** Service description: The network function involved in providing the interception of IMS-based services is determined based on the deployment option. The IRI-POI functions are provided by the network functions that handle the SIP messages (IMS Signalling Functions) and the triggered CC-POI functions are provided by the network functions that handle the media (IMS Media Functions). The CC-TF functions are provided by the network functions that handle the SIP messages (IMS Signalling Functions) and manage the IMS Media Functions. The network functions that provide the CC-TF functions can be different from the network functions that provide the IRI-POI functions.	
7.12.2.2	**Target type and target identifiers** The following target identifier formats can be used to identify a target for IMS based services: IMPU, IMPI, PEIIMEI, IMEI.	An IMPI may contain a value derived from a SUPI or an IMSI. An IMPU may contain a value derived from a SIP URI, TEL URI, GPSI, MSISDN, E.164 number or IMSI.
7.12.2.5	**Service scoping** Service scoping is not used in Switzerland.	
7.12.2.6	**Location reporting** In Switzerland the location reporting is not limited at the beginning and end of the IMS session. Any location information available via the target's P-Access-Network-Info or Cellular-Network-Info SIP header fields present in the signaling shall be delivered to the LEMF.	For IMS, the target location reporting is based on the information available in the P-Access-Network-Info and Cellular-Network-Info SIP header fields and shall be encoded in the IRI records as specified in sections 6.3.9.4 respectively 6.3.10.2 of the present document.

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.12.7	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `IMSMessage`, `StartOfInterceptionForActiveIMSSession`, `IMSCCUnavailable`, `IMSDataChannelSetup`, `IMSDataChannelModification`, `IMSDataChannelTermination`, `StartOfInterceptionWithEstablishedIMSDataChannel`	
7.12.8	**Generation of CC over LI_HI3** CC records shall be generated based on the xCC records payload received over the LI_X3 interface and delivered in the `IMSCCPDU` structure. The SDP session description received in the xCC shall be delivered in the `sDPInfo` element of the `IMSCCPDU` structure.	
7.12.9	**Removal of unauthorised information from IMS record payloads** The Removal of unauthorised information from IMS record payloads is not used in Switzerland.	
7.12.10	**Generation of xIRI from media plane packets** The choice of the approach 1 or 2 is under the control of the CSP and is out of scope of the present document.	
7.12.11	**Interception of post dialled digits** Post dialled digits conveyed as RTP telephony events over the media-path based signalling shall be delivered as specified in Table 7.12.11.2-1. Post dialled digits conveyed as SIP signalling shall be delivered as regular `IMSMessage` IRI REPORT.	
7.13	**RCS** Service description: Rich Communication Suite (RCS) is the platform that enables the delivery of communication experiences beyond voice and SMS, providing consumers with a number of services related to: Capability discovery, Standalone messaging, Chat, File URL transfer, Upload and download of files. RCS requires the IMS to enable communication between RCS clients.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.13.4	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `RCSRegistration`, `RCSCapabilityDiscovery`, `RCSMessage`, `RCSSessionEstablishmentAttempt`, `RCSSessionModification`, `RCSSessionRelease`, `StartOfInterceptForRegisteredRCSUser`, `StartOfInterceptWithEstablishedRCSSession`	
7.13.5	**Redaction of unauthorised information from encapsulated RCS payloads** The Redaction of unauthorised information from encapsulated RCS payloads is not used in Switzerland.	
7.13.7	**Generation of CC over LI_HI3** CC records shall be generated based on the xCC records payload received over the LI_X3 interface and delivered over LI_HI3 in the `RCSCCPDU` structure.	
7.14	**LI at EES** Service description: Edge computing is a concept that enables operator and 3rd party services to be hosted close to the UE's access point of attachment, to achieve an efficient service delivery through the reduced end-to-end latency and load on the transport network. The EES is a component of the edge enabler layer which facilitates communication between the Application Clients running on the UE and the Edge Application Server deployed on the Edge Data Network.	
7.14.2.11	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `EESEECRegistration`, `EESEASDiscovery`, `EESEASDiscoverySubscription`, `EESEASDiscoveryNotification`, `EESAppContextRelocation`, `EESACRSubscription`, `EESACRNotification`, `EESEECContextRelocation`, `EESStartOfInterceptionWithRegisteredEEC`	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.15	**LI at 5GMS AF** Service description: 5G Media Streaming (5GMS) is defined as the delivery of time-continuous media as the predominant media. Streaming points to the fact that the media is predominantly sent only in a single direction and consumed as it is received.	
7.15.3	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `FiveGMSAFServiceAccessInformation`, `FiveGMSAFConsumptionReporting`, `FiveGMSAFDynamicPolicyInvocation`, `FiveGMSAFMetricsReporting`, `FiveGMSAFNetworkAssistance`, `FiveGMSAFUnsuccessfulProcedure`, `FiveGMSAFStartOfInterceptionWithAlreadyConfiguredUE`	
7.16	**LI at NWDAF** Service description: Network Data Analytics Function (NWDAF) is a 5G network function which analyses data collected from network functions, OAM and UEs via AF in the 5G System, and publishes the analytics results to subscribing data analytics consumers.	
7.16.3	**Generation of IRI over LI_HI2** IRI REPORT shall be generated based on the xIRI record payload for: `NWDAFEventsSubscription`, `NWDAFEventsNotification`, `NWDAFAnalyticsInfoQuery`, `NWDAFRoamingAnalyticsSubscription`, `NWDAFRoamingAnalyticsNotification`	
Annex A	**Structure of both the Internal and External Interfaces** The applicable ASN.1 `TS33128Payloads` module version is specified in the Annex 1 section 6.6.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications

Annex B	**LI Notification**
	Only the `notificationType` for `activation` and `deactivation` are required.
	The `activation` notification shall only be sent to the LEMF when the activation occurs in the CSP's ADMF.
	
	The `activation` notification shall be composed of the fields:
	`notificationType`
	`appliedDeliveryInformation`: LEMF delivery IP addresses and ports of the HI2 and HI3 interfaces
	`appliedTargetID`
	`appliedStartTime`: CSP activation in the ADMF
	
	The `deactivation` notification shall be composed of the fields:
	`notificationType`
	`appliedTargetID`
	`appliedEndTime`: CSP deactivation in the ADMF.
		The fields `appliedTargetIsLocal` and `appliedTargetIsNonLocal` are not used in Switzerland.

Annex C	**XSD Schema for LI_X1 extensions** The XSD Schema `3GPPX1Extensions` is under the control of the CSP and is out of scope of the present document.	
Annex E	**XSD Schema for Identity Association** The XSD Schema `3GPPIdentityExtensions` is used and described in the present document in the sections 0 and 8.5.2.	
Annex F	**ASN.1 Schema for LI_XER messages** The ASN.1 Schema `TS33128IdentityAssociation` is under the control of the CSP and is out of scope of the present document.	
Annex H	**XSD Schema for State Transfers** The XSD Schema `3GPPStateTransfer` is under the control of the CSP and is out of scope of the present document.	

Clause ETSI TS 133 128 V18.12.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
Annex I	**XSD Schema for Location Acquisition** Location acquisition is not used in Switzerland.	
Annex L	**XSD Schema for LI Queries** The XSD Schema `3GPPLIQueryExtensions.xsd` is under the control of the CSP and is out of scope of the present document.	
Annex M	**Reuse of externally defined structures** Definition of LI structures to allow for the reuse of externally defined structures and schemas. The encapsulated information modification specified in clause M.2 is not used in Switzerland.	
Annex N	**Application to proprietary implementations** CSP that use proprietary implementations for network and service layers for 3GPP defined networks shall inform PTSS about the alternative triggers used to report the events specified in ETSI TS 133 127 V18.12.0.	

Table 6-34: ETSI TS 133 128 V18.12.0 Protocol and procedures for Lawful Interception for 5GS

6.5.10 ML_50_RT: Specific requirements for the handover of the mobile location real-time interception type

This section provides the requirements for the handover of the mobile location real-time interception type ML_50_RT which is composed of subsets of the mobile network access and multimedia and the telephony interception types.

The distinct IRI records related to the ML_50_RT interception type are specified in the following sections 6.5.10.1 and 6.5.10.2 and provide only some specific ASN.1 structures, parameters and identifiers. Besides the regular IRI headers and communication service information parameters, only the identifiers, location and position information and access network information pertaining to the target must be delivered in these ML_50_RT related IRI records.

Because of this specificity, the designated ASN.1 structures, parameters and identifiers composing the IRI records are noted with a qualifier attribute “Mandatory” or “Conditional” with the following meaning:

“Mandatory”: The ASN.1 structure, parameter or identifier must be present in the delivered ML_50_RT related IRI record.
“Conditional”: The presence of the ASN.1 structure, parameter or identifier may or may not be present in the ML_50_RT related IRI record depending on the communication service and the service procedure being intercepted.

6.5.10.1 Mobile network access requirements for ML_50_RT

The mobile network access interception for ML_50_RT consists of a subset of the structures, parameters and identifiers from the RT_22_NA_IRI interception type.

For GERAN (2G), UTRAN (3G), E-UTRAN (4G) mobile access and Non-3GPP access to EPS the handover interface shall be based on ETSI TS 133 108 V18.0.0. The transport and delivery of the corresponding IRI records shall be configured as specified in section 6.5.2 with the specific ASN.1 structures, parameters and identifiers enumerated in the following table.

ETSI TS 133 108 V18.0.0 Annex B.9 specific requirements for mobile network access ML_50_RT	
Description of the IRI record structure	Qualifier

The `EpsHI2Operations` IRI record header structure shall contain the following parameters and identifiers:
`EpsIRIContent`
`Hi2epsDomainId OBJECT IDENTIFIER`
`lawfulInterceptionIdentifier`
`timeStamp`
`initiator`
	
	Mandatory
	Mandatory
	Mandatory
	Mandatory
	Mandatory

The location or position information structure shall be delivered with one of the following structures (refer to section 6.3.8 for guidance):
`locationOfTheTarget`
`additionalCellIDs`
or
`ePSlocationOfTheTarget`
	
	Conditional
	Conditional
	
	Conditional

The target identifier structure (only the identifier of the target shall be delivered):
`partyInformation`
`  party-Qualifier`
`    gPRSorEPS-Target`
`  partyIdentity`
`    imsi`
`    msISDN`
`    nAI`
	
	Mandatory
	Mandatory
	Mandatory
	Mandatory
	Mandatory
	Conditional
	Conditional

The correlation, event and network identifier structures:
`ePSCorrelationNumber`
`ePSevent`
`networkIdentifier`
`    operator-Identifier`
`    network-Element-Identifier`
	
	Conditional
	Conditional
	Mandatory
	Mandatory
	Conditional

Table 6-35: ML_50_RT IRI record for mobile access based on ETSI TS 133 108 V18.0.0

For NR (5G) mobile access and Non-3GPP access to 5GS the handover interface shall be based on ETSI TS 102 232-1 V3.34.1 and ETSI TS 133 128 V18.12.0. The transport and delivery of the corresponding IRI records shall be configured as specified in sections 6.5.3 and 6.5.9 with the specific ASN.1 structures, parameters and identifiers enumerated in the following table.

ETSI TS 102 232-1 V3.34.1 and ETSI TS 133 128 V18.12.0 specific requirements for mobile network access ML_50_RT	
Description of the IRI record `PSHeader` and `Payload` structures and parameters according to ETSI TS 102 232-1 V3.34.1	Qualifier
`li-psDomainId OBJECT IDENTIFIER`	Mandatory
`lawfulInterceptionIdentifier`	Mandatory
`authorizationCountryCode`	Mandatory
`communicationIdentifier`	Mandatory
`networkIdentifier`	Mandatory
`operatorIdentifier`	Mandatory
`networkElementIdentifier`	Conditional
`communicationIdentityNumber`	Conditional
`deliveryCountryCode`	Conditional
`sequenceNumber`	Mandatory
`timestamp`	Mandatory
`timeStampQualifier`	Mandatory
`iRIPayloadSequence`	Mandatory
`iRIType`	Mandatory
`timestamp`	Conditional
`iRIContents`	Mandatory
Description of the IRIPayload record from the `TS33128Payloads` structure according to ETSI TS 133 128 V18.12.0	
`IRIPayload`	Mandatory
`relativeOID`	Mandatory
`event`	Mandatory
`targetIdentifiers`	Mandatory
The following `IRIEvent` structures and parameters can be delivered in the `event` schema depending on which procedure is intercepted:	
`registration`	Conditional
`registrationType`	Mandatory
`registrationResult`	Mandatory
`sUPI`	Conditional
`sUCI`	Conditional
`gPSI`	Conditional
`location` (NOTE 1)	Conditional
or	
`deregistration`	Conditional
`deregistrationDirection`	Mandatory
`accessType`	Mandatory
`sUPI`	Conditional
`sUCI`	Conditional
`gPSI`	Conditional
`cause`	Conditional

location	(NOTE 1)	Conditional
or		
locationUpdate		Conditional
sUPI		Conditional
sUCI		Conditional
gPSI		Conditional
location	(NOTE 1)	Conditional
or		
AMFStartOfInterceptionWithRegisteredUE		Conditional
registrationResult		Mandatory
registrationType		Mandatory
sUPI		Conditional
sUCI		Conditional
gPSI		Conditional
location	(NOTE 1)	Conditional
non3GPPAccessEndpoint	(NOTE 1)	Conditional
timeOfRegistration		Conditional
or		
unsuccessfulRegistrationProcedure		Conditional
failedProcedureType		Mandatory
failureCause		Mandatory
sUPI		Conditional
sUCI		Conditional
gPSI		Conditional
location	(NOTE 1)	Conditional
or		
SMFPDUSessionEstablishment		Conditional
sUPI		Conditional
gPSI		Conditional
pDUSessionID		Mandatory
gTPTunnelID		Mandatory
pDUSessionType		Mandatory
non3GPPAccessEndpoint	(NOTE 1)	Conditional
location	(NOTE 1)	Conditional
dNN		Mandatory
requestType		Mandatory
accessType		Conditional
rATType		Conditional
or		
SMFPDUSessionModification		Conditional
sUPI		Conditional
gPSI		Conditional
non3GPPAccessEndpoint	(NOTE 1)	Conditional
location	(NOTE 1)	Conditional
requestType		Mandatory
accessType		Conditional
rATType		Conditional
or		
SMFPDUSessionRelease		Conditional
sUPI		Mandatory
gPSI		Conditional
pDUSessionID		Mandatory
location	(NOTE 1)	Condition
or		

lALSReport sUPI gPSI location (NOTE 1)	Conditional Conditional Conditional Mandatory
The following IRITargetIdentifier structures and parameters shall be delivered in the targetIdentifiers schema: TargetIdentifier sUPI iMSI gPSI mSISDN nAI	 Mandatory Conditional Conditional Conditional Conditional Conditional
NOTE 1: The Annex 1 section 6.3.8 provides guidance about the location and positioning information ASN.1 structure and parameters.	

Table 6-36: ML_50_RT IRI record for mobile access based on ETSI TS 133 128 V18.12.0

6.5.10.2 Multimedia and telephony requirements for ML_50_RT

The multimedia and telephony interception for ML_50_RT consists of a subset of the parameters from the RT_24_TEL_IRI interception type.

For multimedia and telephony interception for ML_50_RT the handover interface used to deliver the intercepted data depends on the mobile radio access technology used to realise the multimedia session or the telephony call.

Multimedia or telephony service	Handover interface
Circuit-switched telephony and message based on GERAN (2G) or UTRAN (3G) mobile radio access technology.	ETSI TS 102 232-1 V3.34.1 ETSI TS 102 232-6 V3.5.1
IMS-based VoIP multimedia session or message based on E-UTRAN (4G) mobile radio access technology and circuit-switched telephony and message based on GERAN (2G) or UTRAN (3G) mobile radio access technology using IMS Centralised Services.	ETSI TS 133 108 V18.0.0 or ETSI TS 102 232-1 V3.34.1 ETSI TS 102 232-5 V3.21.1
IMS-based VoIP multimedia session or message based on NR (5G) mobile radio access technology	ETSI TS 102 232-1 V3.34.1 ETSI TS 133 128 V18.12.0

Table 6-37: Multimedia or telephony service handover interfaces

For circuit-switched telephony and message using the IP handover interface based on ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-6 V3.5.1 the transport and delivery of the corresponding IRI records shall be configured as specified in sections 6.5.3 and 6.5.7 with the specific ASN.1 structures, parameters and identifiers enumerated in the following table.

ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-6 V3.5.1 specific requirements for mobile network access ML_50_RT	
Description of the IRI record `PSHeader` and `Payload` structures and parameters according to ETSI TS 102 232-1 V3.34.1	Qualifier

`li-psDomainId OBJECT IDENTIFIER`
`lawfulInterceptionIdentifier`
`authorizationCountryCode`
`communicationIdentifier`
`  networkIdentifier`
`  operatorIdentifier`
`  networkElementIdentifier`
`  communicationIdentityNumber`
`  deliveryCountryCode`
`sequenceNumber`
`timestamp`
`timeStampQualifier`
 	
`iRIPayloadSequence`
`  iRIType`
`  timestamp`
`  iRIContents`
	Mandatory
	Mandatory
	Mandatory
	Mandatory
	Mandatory
	Mandatory
	Mandatory
	Conditional
	Conditional
	Mandatory
	Mandatory
	Mandatory
	
	Mandatory
	Mandatory
	Conditional
	Mandatory

Description of the `IRIPayload` record from the `PstnIsdnPDU` structure according to ETSI TS 102 232-6 V3.5.1
`IRIPayload`
`  iRIType`
`  iRIContents`
`  eTSI671IRI` (NOTE 1)
	
	Mandatory
	Mandatory
	Mandatory
	Mandatory

NOTE 1: The structure `eTSI671IRI` shall be filled as indicated in the Table 6-39 below.	

Table 6-38: ML_50_RT IRI record for circuit-switched telephony based on ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-6 V3.5.1

ETSI TS 101 671 V3.12.1 Annex D.5 specific requirements for circuit-switched telephony ML_50_RT used in conjunction with `eTSI671IRI` specified in ETSI TS 102 232-6 V3.5.1	
Description of the `HI2Operations` IRI record structure	Qualifier

The IRI record can contain the following structures and identifiers:
`iRIContent`
`domainID`
`iRIversion`
`lawfulInterceptionIdentifier`
`communicationIdentifier`
`timeStamp`
`intercepted-Call-Direct`
`intercepted-Call-State`
`locationOfTheTarget`
`partyInformation`
`nature-Of-The-intercepted-call`
`sMS`
	
	Mandatory
	Mandatory
	Mandatory
	Mandatory
	Mandatory
	Mandatory
	Conditional
	Conditional
	Mandatory
	Mandatory
	Conditional
	Conditional

Details of the `CommunicationIdentifier` structure
`CommunicationIdentifier`
`communication-Identity-Number`
`network-Identifer`
`operator-Identifier`
`network-Element-Identifier`
	
	Mandatory
	Conditional
	Mandatory
	Mandatory
	Conditional

Details of the `Location` structure (refer to section 6.3.8 for guidance):
`Location`
`e164-Number`
`globalCellID`
`gsmLocation`
`sAI`
`tAI`
`eCGI`
	
	Mandatory
	Conditional
	Conditional
	Mandatory
	Conditional
	Conditional
	Conditional

Details of the `PartyInformation` structure (only the identifiers of the target shall be delivered):
`PartyInformation`
`party-Qualifier`
`partyIdentity`
`imsi`
`msISDN`
`e164-Format`
	
	Mandatory
	Mandatory
	Mandatory
	Mandatory
	Conditional
	Conditional

Details of the `SMS-Report` structure:
`SMS-report`
`communicationIdentifier`
`timeStamp`
`sMS-Contents`
`initiator`
	
	Conditional
	Mandatory
	Mandatory
	Mandatory
	Mandatory

Table 6-39: ML_50_RT IRI record for circuit-switched telephony based on `eTSI671IRI`

For IMS-based VoIP multimedia and telephony using the IP handover interface based on ETSI TS 133 108 V18.0.0 the transport and delivery of the corresponding IRI records shall be configured as specified in section 6.5.2 with the specific ASN.1 structures, parameters and identifiers enumerated in the following table.

ETSI TS 133 108 V18.0.0 Annex B.9 specific requirements for IMS-based VoIP multimedia and telephony for ML_50_RT	
Description of the `EpsHI2Operations` IRI record structure	Qualifier

The IRI record header structure shall contain the following parameters and identifiers:
`EpsIRIContent`
`Hi2epsDomainId OBJECT IDENTIFIER`
`lawfulInterceptionIdentifier`
`timeStamp`
	
	Mandatory
	Mandatory
	Mandatory
	Mandatory

The location information shall be delivered with the `pANI-Header-Info` structure (refer to section 6.3.9.2 for guidance):
`pANI-Header-Info`
`access-Type`
`access-Class`
`network-Provided`
`pANI-Location`
`raw-Location`
`location`
`ePSLocation`
	
	Mandatory
	Conditional
	Conditional
	Conditional
	Mandatory
	Mandatory
	Conditional
	Conditional

The target identifier structure (only the identifiers of the target shall be delivered):
`partyInformation`
`party-Qualifier`
`gPRSorEPS-Target`
`partyIdentity`
`imsi`
`msISDN`
`sip-uri`
`tel-uri`
`iMPI`
	
	Mandatory
	Mandatory
	Mandatory
	Mandatory
	Conditional
	Conditional
	Conditional
	Conditional
	Conditional

The correlation, event and network identifier structures:
`ePSCorrelationNumber`
`networkIdentifier`
`operator-Identifier`
`network-Element-Identifier`
	
	Conditional
	Mandatory
	Mandatory
	Conditional

Table 6-40: ML_50_RT IRI record for IMS-based multimedia and telephony based on ETSI TS 133 108 V18.0.0

For IMS-based VoIP multimedia and telephony using the IP handover interface based on ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-5 V3.21.1 the transport and delivery of the corresponding IRI records shall be configured as specified in sections 6.5.3 and 6.5.6 with the specific ASN.1 structures, parameters and identifiers enumerated in the following table.

ETSI TS 102 232-1 V3.34.1 and ETSI TS 102 232-5 V3.21.1 specific requirements for IMS-based VoIP multimedia and telephony ML_50_RT	
Description of the IRI record `PSHeader` and `Payload` structures and parameters according to ETSI TS 102 232-1 V3.34.1	Qualifier
`li-psDomainId OBJECT IDENTIFIER`	Mandatory
`lawfulInterceptionIdentifier`	Mandatory
`authorizationCountryCode`	Mandatory
`communicationIdentifier`	Mandatory
`    networkIdentifier`	Mandatory
`        operatorIdentifier`	Mandatory
`        networkElementIdentifier`	Mandatory
`    communicationIdentityNumber`	Conditional
`    deliveryCountryCode`	Conditional
`sequenceNumber`	Mandatory
`timestamp`	Mandatory
`timeStampQualifier`	Mandatory
`iRIPayloadSequence`	Mandatory
`    iRIType`	Mandatory
`    timestamp`	Conditional
`    iRIContents`	Mandatory
Description of the `IRIPayload` record from the `IPMultimediaPDU` structure according to ETSI TS 102 232-5 V3.21.1	
`IRIPayload`	Mandatory
`    iRIType`	Mandatory
`    iRIContents`	Mandatory
`        iPMMIRI`	Mandatory
`            iPMMIRIObjId  RELATIVE-OID`	Mandatory
`            iPMMIRIContents`	Mandatory
`                nationalIPMMIRIParameters`	Mandatory
`                    countryCode` (NOTE 1)	Mandatory
`            targetLocation`	Conditional
`                epsLocation` (NOTE 2)	Conditional
`            additionalSignalling` (NOTE 3)	Mandatory
`                sipHeaderLine` (NOTE 4)	Mandatory
`                sipHeaderLine` (NOTE 5)	Conditional
`                sipHeaderLine` (NOTE 6)	Conditional

NOTE 1: The parameter .countryCode shall have the value CH according to ISO 3166-1
NOTE 2: When delivered, the epsLocation structure shall be composed of the parameters and identifiers according to the requirements in the section 6.3.8.
NOTE 3: The structure additionalSignalling may be composed of one or several sipHeaderLine values.
NOTE 4: The first instance of the sipHeaderLine shall provide the SIP-URI or TEL-URI of the target contained in one of the SIP message header lines (e.g., To: or From: or P-Asserted-Identity or P-Called-ID or Additional-Identity, etc…).
For example for a target originated session: From: <sip:+41759998877@ims.mnc99.mcc228.3gppnetwork.org>
NOTE 5: The second instance of the sipHeaderLine may be used to provide the access network information of the target with a complete copy of the P-Access-Network-Info SIP header line when available in the SIP message header.
NOTE 6: The third instance of the sipHeaderLine may be used to provide the Cellular-Network-Info of the target with a complete copy of the Cellular-Network-Info SIP header line when available in the SIP message header.

Table 6-41: ML_50_RT IRI record for VoIP and IMS-based multimedia and telephony based on 102 232-1 V3.34.1 and ETSI TS 102 232-5 V3.21.1

For IMS-based VoIP multimedia and telephony using the IP handover interface based on ETSI TS 102 232-1 V3.34.1 and ETSI TS 133 128 V18.12.0 the transport and delivery of the corresponding IRI records shall be configured as specified in sections 6.5.3 and 6.5.9 with the specific ASN.1 structures, parameters and identifiers enumerated in the following table.

ETSI TS 102 232-1 V3.34.1 and ETSI TS 133 128 V18.12.0 specific requirements for mobile network access ML_50_RT	
Description of the IRI record PSHeader and Payload structures and parameters according to ETSI TS 102 232-1 V3.34.1	Qualifier
li-psDomainId OBJECT IDENTIFIER	Mandatory
lawfulInterceptionIdentifier	Mandatory
authorizationCountryCode	Mandatory
communicationIdentifier	Mandatory
networkIdentifier	Mandatory
operatorIdentifier	Mandatory
networkElementIdentifier	Conditional
communicationIdentityNumber	Conditional
deliveryCountryCode	Conditional
sequenceNumber	Mandatory
timestamp	Mandatory
timeStampQualifier	Mandatory
iRIPayloadSequence	Mandatory
iRIType	Mandatory
timestamp	Conditional
iRIContents	Mandatory

Description of the IRIPayload record from the `TS33128Payloads` structure according to ETSI TS 133 128 V18.12.0	
`IRIPayload`	Mandatory
`relativeOID`	Mandatory
`event`	Mandatory
`targetIdentifiers`	Mandatory
The following `IRIEvent` structures and parameters can be delivered in the `event` schema for IMS services:	
`iMSMessage`	Mandatory
`payload`	Mandatory
`encapsulatedSIPMessage`	Mandatory
`iPSourceAddress`	Mandatory
`iPDestinationAddress`	Mandatory
`sIPContent` (NOTE 1)	Mandatory
`sessionDirection`	Mandatory
`location`	Mandatory
`locationInfo`	Mandatory
`userLocation` (NOTE 2)	Mandatory
The following `IRITargetIdentifier` structures and parameters shall be delivered in the `targetIdentifiers` schema:	
`TargetIdentifier`	Mandatory
`sUPI`	Conditional
`iMSI`	Conditional
`gPSI`	Conditional
`mSISDN`	Conditional
`nAI`	Conditional

NOTE 1: Due to the specific requirements for the ML_50_RT interception type, the `sIPContent` shall contain only a subset of the whole SIP message. The `sIPContent` shall contain only the following SIP header fields pertaining to the target when present in the intercepted SIP message:

- P-Asserted-Identity
- User-Agent
- P-Visited-Network-ID
- P-Access-Network-Info
- Cellular-Network-Info

NOTE 2: The Annex 1 sections 6.3.9.4 and 6.3.10.2 provide guidance about the `userLocation` information ASN.1 structure and parameters to be delivered for IMS services.

Table 6-42: ML_50_RT IRI record for VoIP and IMS-based multimedia and telephony based on 102 232-1 V3.34.1 and ETSI TS 133 128 V18.12.0

6.6 Applicable ASN.1 module versions for real-time interceptions

Any superior version can be adopted from the CSP for better performances. This must be agreed with PTSS in order to ensure the compatibility with the actual PTSS LEMF systems, and this requires a new compliance assessment.
Any existing syntax errors in the ASN.1 modules should be corrected. The correct object identifier (OID) and the correct version number must be used and delivered.

Applicable ASN.1 Module	OID versions ETSI TR 102 503 V1.19.1	Technical specifications
ETSI TS 101 671 Circuit-switched domain (Annex 1 section 6.5.1.1)		
HI1NotificationOperations (used only as imported module to other handover interfaces)	{0.4.0.2.2.0.1.6} to {0.4.0.2.2.0.1.7}	ETSI TS 101 671 V3.10.1 to ETSI TS 101 671 V3.15.1 or ETSI TS 102 232-1 V3.34.1
HI2Operations (used only as imported module to other handover interfaces)	{0.4.0.2.2.1.16} to {0.4.0.2.2.1.18}	ETSI TS 101 671 V3.10.1 to ETSI TS 101 671 V3.15.1 or ETSI TS 102 232-1 V3.34.1
ETSI TS 133.108 Packet-switched domain (Annex 1 section 6.5.2)		
EpsHI2Operations	{0.4.0.2.2.4.8.13.3} to {0.4.0.2.2.4.8.17.0}	ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V18.0.0
Eps-HI3-PS	{0.4.0.2.2.4.9.12.0} to {0.4.0.2.2.4.9.17.0}	ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V18.0.0
CONFHI2Operations	{0.4.0.2.2.4.10.13.0} to {0.4.0.2.2.4.10.16.0}	ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V18.0.0
CONF-HI3-IMS	{0.4.0.2.2.4.11.13.0} to {0.4.0.2.2.4.11.17.0}	ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V18.0.0
VoIP-HI3-IMS	{0.4.0.2.2.4.12.13.0} to {0.4.0.2.2.4.12.17.0}	ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V18.0.0
GCSEHI2Operations	{0.4.0.2.2.4.13.15.0} to {0.4.0.2.2.4.13.16.0}	ETSI TS 133 108 V15.5.0 to ETSI TS 133 108 V18.0.0
GCSE-HI3	{0.4.0.2.2.4.14.13.0} to {0.4.0.2.2.4.14.17.0}	ETSI TS 133 108 V15.5.0 to ETSI TS 133 108 V18.0.0
ProSeHI2Operations	{0.4.0.2.2.4.15.13.0} to {0.4.0.2.2.4.15.16.0}	ETSI TS 133 108 V15.5.0 to ETSI TS 133 108 V18.0.0
ThreeGPP-HI1NotificationOperations	{0.4.0.2.2.4.0.1.16.1}	ETSI TS 133 108 V16.4.0 to ETSI TS 133 108 V18.0.0
ETSI TS 133 128 5G System (Annex 1 section 6.5.9)		
TS33128Payloads Release 15 Release 16	 {0.4.0.2.2.4.19.15.4} to {0.4.0.2.2.4.19.15.7} or {0.4.0.2.2.4.19.16.4}	 ETSI TS 133 128 V15.7.0 to ETSI TS 133 128 V15.13.0 ETSI TS 133 128 V16.5.0

	to {0.4.0.2.2.4.19.16.17} or	to ETSI TS 133 128 V16.20.0
Release 17	{0.4.0.2.2.4.19.17.4} to {0.4.0.2.2.4.19.17.14}	ETSI TS 133 128 V17.5.0 to ETSI TS 133 128 V17.17.0
Release 18	{0.4.0.2.2.4.19.18.6} to {0.4.0.2.2.4.19.18.12}	ETSI TS 133 128 V18.6.0 to ETSI TS 133 128 V18.12.0
ETSI TS 102 232-1 (Annex 1 section 6.5.3)		
LI-PS-PDU (Note 1)	{0.4.0.2.2.5.1.23} to {0.4.0.2.2.5.1.40}	ETSI TS 102 232-1 V3.11.1 to ETSI TS 102 232-1 V3.34.1
ETSI TS 102 232-2 (Annex 1 section 6.5.4)		
EmailPDU (Note 1)	{0.4.0.2.2.5.2.15} to {0.4.0.2.2.5.2.20}	ETSI TS 102 232-2 V3.9.1 to ETSI TS 102 232-2 V3.16.1
ETSI TS 102 232-3 (Annex 1 section 6.5.5)		
IPAccessPDU (Note 1)	{0.4.0.2.2.5.3.10} to {0.4.0.2.2.5.3.20}	ETSI TS 102 232-3 V3.3.1 ETSI TS 102 232-3 V3.16.1
ETSI TS 102 232-5 (Annex 1 section 6.5.6)		
IPMultimediaPDU (Note 1)	{0.4.0.2.2.5.5.7} to {0.4.0.2.2.5.5.17}	ETSI TS 102 232-5 V3.5.1 ETSI TS 102 232-5 V3.21.1
ETSI TS 102 232-6 (Annex 1 section 6.5.7)		
PstnIsdnPDU (Note 1)	{0.4.0.2.2.5.6.5} to {0.4.0.2.2.5.6.6}	ETSI TS 102 232-6 V3.3.1 ETSI TS 102 232-6 V3.5.1

Table 6-43: Applicable ASN.1 module versions for real-time interceptions

Note 1: While choosing the OID version to be used within the ETSI TS 102 232 specifications family, care must be taken that the Service-specific Details (SSD) version is compatible with the generic header LI-PS-PDU version. The version's compatibility matrix is available in the informative Annex H of the ETSI TS 102 232-1 V3.34.1 specification as from version 3.2.1.

7 Historical Data (Retroactive Interception)

7.1 General

This section covers the general technical requirements that need to be fulfilled by PTSS and the CSP when requesting, respectively providing historical data responses, confined to the service usage category outlined in ETSI TS 102 657 V2.6.1, according to the legal provisions set forth in section 10 of the ordinance VÜPF.

The framework of the retroactive data is divided in different types of services that follow the structure specified in ETSI TS 102 657 V2.6.1 clause 4.2.
Note: Telephony services are considered as a subset of the Synchronous Multi-media service. Therefore, all historical data interceptions related to PSTN/ISDN, SMS, EMS and MMS shall be delivered according to ETSI TS 102 657 V2.6.1 Annex D.

Service	Description
Asynchronous message	Asynchronous messaging services covers asynchronous communications involving the intermediate storage of messages, as defined in ETSI TS 102 657 V2.6.1 Annex C.1. This includes email, webmail but excludes chat, which is synchronous and excludes SMS, EMS and MMS which are addressed by the Multi-media usage record.
Synchronous Multi-media	Synchronous multimedia services cover synchronous multimedia communication sessions and services such as PSTN/ISDN functionality either offered over PSTN/ISDN or emulated PSTN/ISDN including GSM/UMTS-CS, SMS, EMS and MMS, VoIP and IMS as listed in ETSI TS 102 657 V2.6.1 Annex D.1.
Network access	Network access services cover the services offering a capability to access the Internet), including wireline and wireless and Mobile internet access (such as GERAN, UTRAN E-UTRAN and NR), as defined in ETSI TS 102 657 V2.6.1 Annex E.1.

Table 7-1: Historical data service types

For all these services the encoding of the requests sent by PTSS and the retroactive data to be delivered by the CSP is limited to XML. The structure of the XML file shall be validated against the XML schema definition provided with the technical specification ETSI TS 102 657 V2.6.1. The version of the XML schema to be used for validation is defined in the section 7.6.

7.2 Historical data (retroactive) interception types

The table below lists the retroactive interception types specified in the ordinance VÜPF section 10.

Historical data network access interception			
VÜPF article	**Type & Description** (Informative translation)	**Identifiers Handover Interfaces**	**Section**
60 68 f	**HD_28_NA** Network access retroactive interception	Identifiers parameters ETSI TS 102 657 V2.6.1 Annex E	7.3 7.5 7.4.3

Table 7-2: Historical data network access interception types

Historical data application interception			
VÜPF article	**Type & Description** (Informative translation)	**Identifiers Handover Interfaces**	**Section**
61 68 f	**HD_29_TEL** Telephony and multimedia services retroactive interception	Identifiers parameters ETSI TS 102 657 V2.6.1 Annex D	7.3 7.5 7.4.2
62 68 f	**HD_30_EMAIL** E-Mail services retroactive interception	Identifiers parameters ETSI TS 102 657 V2.6.1 Annex C	7.3 7.5 7.4.1
63 68 a	**HD_31_PAGING** Delivery of the last active location of the target.	Identifiers parameters & Proprietary handover interface or ETSI TS 102 657 V2.6.1 Annex E	7.3 7.5 7.4.4
64 68 g	**AS_32_PREP_COV** Network analysis in preparation of a search by cell coverage area	Identifiers parameters ETSI TS 102 657 V2.6.1 Annex D or Annex E	7.3 7.5 7.4.5 7.4.3
65 68 g	**AS_33_PREP_REF** Determination of mobile cells by reference calls in preparation of a search by cell coverage area	Identifiers parameters ETSI TS 102 657 V2.6.1 Annex D or Annex E	7.3 7.5 7.4.6 7.4.3
66 68 g	**AS_34** **AS_34_MORE** Search by cell coverage area by mobile telephony and network access	Identifiers parameters ETSI TS 102 657 V2.6.1 Annex D or Annex E	7.3 7.5 7.4.7 7.4.2 7.4.3

Table 7-3: Historical data applications interception types

Historical data emergency search			
VÜPF article	**Type & Description** (Informative translation)	**Identifiers Handover Interfaces**	**Section**
67 a	**EP_35_PAGING** Delivery of the last active location	Identifiers parameters & Proprietary handover interface or ETSI TS 102 657 V2.6.1 Annex E	7.3 7.5 7.4.4
67 f	**EP_38_HD** Network access and telephony and multimedia services retroactive interception	Identifiers parameters ETSI TS 102 657 V2.6.1 Annex D or Annex E	7.3 7.5 7.4.2 7.4.3 7.4.8

Table 7-4: Historical data emergency search

7.3 Common identifiers and parameters of the handover interfaces

This section provides the description of the common parameters and identifiers that are present in the headers of the retroactive data requests to be sent by the PTSS and the repsonses to be sent by the CSP.

7.3.1 XML elements of the header for historical data requests by PTSS

The information contained in the XML header is based on the specification ETSI TS 102 657 V2.6.1 clauses 6.1 and 6.2

Element or attribute	Description	Example
rdHeaderId	Object Identifier	0.4.0.2.3.0.33
retainedDataHeader		
requestID		
countryCode	A country code as per ISO 3166-1	CH
authorisedOrganisationID	Organisation that requested the data.	PTSS
requestNumber	Unique reference of the order request. It is provided by PTSS and serves as reference for the administration of the request.	HD_201707121234567
externalIdentifier	Parameter to correlate one or several requests (instructions). Format: string	HD_20170712123456
cSPID	Five-digit number provided by PTSS to identify each CSP.	99908

timeStamp	The local date and time when the request was created. Formatted as "GeneralizedTime"	20160319131625Z
requestType	Request type provided by PTSS	HD_28_NA HD_29_TEL
requestFlag	Parameter indicating whether the request is a normal interception or a test interception. The different tests types are specified by the PTSS.	Normal TEST_PTE TEST_PTSA TEST_PTSE TEST_PTSTR TEST_PTSTE TEST_CTT TEST_ATT
retainedDataPayload		
requestMessage		
requestPriority	This element specifies the priority of the request. 00 indicates a high priority (Urgent). 01 indicates a regular priority.	00 01
requestParameters	This structure contains a sequence of request criteria. Each criterion shall be expressed as a RequestConstraints parameter. It is structured in two main parts: The first part specifies the service, category and target identity with the parameter “equals”. The second part provides the time period interval with the parameters “lessThanOrEqualTo” and “greaterThanOrEqualTo” for which the historical data records shall be delivered by the CSP. The time indication shall be in local time. A request can only ask for historical data of one target identity of one service and one category.	RequestConstraints elements: equals lessThanOrEqualTo greaterThanOrEqualTo isAMemberOf
deliveryPointHIB	Optional element that indicates the delivery point where the historical data must be sent to. When using the HTTPS handover interface In case of delivery via secure Email, PTSS provides a long term Email address with the	URI: https://ptss-host[nn].lidn.ejpd.admin.ch/P/HIB/RDC/ (*where* [nn] *is a host-number defined by PTSS*).

	necessary PGP certificate to the CSP. In case of delivery of a transportable physical storage media (e.g. CD, DVD, HDD) the civic address for the delivery is provided by PTSS via secure Email to the CSP.	
maxRecordsPerBatch	Optional element that is determined by PTSS based on consultations with the CSP its use and its value. When used it indicates that multi-part delivery is used and each ResponseMessage contains not more records than specified.	4000

Table 7-5: XML elements of the header for historical data requests by PTSS

7.3.2 XML elements of the header for retained data responses by CSP

The information contained in the XML header is based on the specification ETSI TS 102 657 V2.6.1 clauses 6.1 and 6.2.

Element or attribute	Description	Example
rdHeaderId	Object Identifier	0.4.0.2.3.0.33
requestID		
countryCode	A country code as per ISO 3166-1	CH
authorisedOrganisationID	Organisation that requested the data.	PTSS
requestNumber	Unique reference of the request (instruction). It shall be populated with the character string provided in the element "file-number" of the XML order.dtd file.	HD_201707121234567
cSPID	Five-digit number provided by PTSS to each CSP.	99908
timeStamp	Formatted as "GeneralizedTime"	20140319131625Z 20140319141625+0100
requestType	Request type provided by PTSS	HD_28_NA HD_29_TEL
responseMessage		
responseStatus	Response status from CSP can be: - responseComplete: if all records related to the instruction are included. - responseIncomplete: if more records will be delivered later. Note: If the responseIncomplete is used then the parameter responseNumber must indicate the number of the multi-part delivery. - responseFailed: if the instruction cannot be fulfilled.	
responsePayload		
recordNumber	The recordNumber shall start at 0 and shall increment for each record delivered under the original instruction.	0, 1, 2, 3, etc...

Table 7-6: XML elements of the header for retained data responses by CSP

7.4 Formats and coding requirements for retroactive data

7.4.1 HD_30_EMAIL Asynchronous message service usage request and responses

The encoding and formats of the parameters for the asynchronous message service usage requests and responses relate to ETSI TS 102 657 V2.6.1 Annexes A and C.

7.4.1.1 Asynchronous message service usage request criteria elements and structure

This section covers the request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the asynchronous message service usage.
The possible requests are divided into two sub-categories:
MsgTransmission
or
MsgStoreOperation

Target identity for asynchronous message		
Element or attribute	**Description**	**Example**
equals	Request constraint	
messageRecord	Service = asynchronous message	
msgServiceUsage	Category = asynchronous message service usage	
msgTransmission	XSD structure Only msgTransmission will be used in the request.	
senderAddress	The element “senderAddress” is used to specifiy the target identity. The reply contains all messages that have been sent to or received by the target identity, or all store operations executed by the target identity	bob@biloxi.com

Time period interval for asynchronous message		
Element or attribute	**Description**	**Example**
lessThanOrEqualTo and greaterThanOrEqualTo	Request constraints defining the time period interval for the historical data.	
messageRecord	Service = asynchronous message	
msgServiceUsage	Category = asynchronous message service usage	

msgTransmission	XSD structure	
dateTime	All communications with startTime in the given period interval in “GeneralizedTime” format.	20140417235959+0200 20140401120000+0200

7.4.1.2 Asynchronous message service usage response elements

The message service usage record is composed of two distinct structures that shall be used depending on the messaging event to be reported:
a) The "msgTransmission" structure applies to events that are related to the sending, reception or relaying of an internet message.
b) The "msgStoreOperation" structure applies to events that are related to the manipulation of a message store by a subscriber. For example the deletion, the edition or the retrieval of an internet message in a message store instance.

The elements and fields of the asynchronous message service usage records are specified in ETSI TS 102 657 V2.6.1 Annex C.2.3 with the following requirements and examples:

dateTime	Tables C.3,C4
Description and requirements	*Examples*
The calendar date and time of when the subscriber submitted the message to the CSP's message server with at least a precision to the second. It shall be in local time with indication of the time zone relative to UTC or in UTC time. The format is according to the GeneralizedTime.	20140214224718+0100 20140615092545+0200 20140712160841.2+0200 20170710143523Z

subscriberID	Tables C.3,C4
Description and requirements	*Examples*
Unique identifier of the subscriber sending the message in [MsgTransmission] or performing the operation in [MsgStoreOperation].	alice@atlanta.com

senderAddress	Tables C.3,C4
Description and requirements	*Examples*
The available address of the sender.	alice@atlanta.com bob@biloxi.com

recipients	Tables C.3,C4
Description and requirements	*Examples*
The list of all available recipients of the message.	alice@atlanta.com bob@biloxi.com

msgStores [MsgTransmission]	Tables C.3
Description and requirements	*Example*
SEQUENCE OF MsgStoreID List of all local message stores that received a copy of the message. This is both relevant for incoming	2174A46EFB23

messages, and for outgoing messages that have a local recipient.	

msgStore [MsgStoreOperation]	Table C.4
Description and requirements	*ELEMENTS*
Description: "Unique identifier of the message store being manipulated."	2174A46EFB23

deliveryStatus	Table C.3
Description and requirements	*ELEMENTS*
Provides the result of the transmission from the CSP's message server towards the final destination. Final delivery may pass through a number of intermediate message servers. This field does not indicate the end-to-end delivery status. It indicates the status of the "next hop".	unknown succeeded failed retried

protocol [MsgTransmission]	Tables C.3
Description and requirements	*ELEMENTS*
Message transmission protocol used.	smtp x400

protocol [MsgStoreOperation]	Tables C.4
Description and requirements	*ELEMENTS*
Message store manipulation protocol.	pop imap webmail

clientID [MsgTransmission]	Tables C.3
Description and requirements	*Examples*
IP address of the source of the message transmission. The IP address can be either IPv4 or IPv6. Preferably in text format using the element "iPTextAddress".	203.0.113.28 2001:db8:85a3::8a2e:370:7334

clientID [MsgStoreOperation]	Tables C.4
Description and requirements	*Examples*
IP address of the subscriber who performed the indicated operation. The IP address can be either IPv4 or IPv6. Preferably in text format using the element "iPTextAddress".	203.0.113.28 2001:db8:85a3::8a2e:370:7334

serverID [MsgTransmission]	Tables C.3
Description and requirements	*Examples*
IP address of the destination of the message transmission. The IP address can be either IPv4 or IPv6. Preferably in text format using the element "iPTextAddress".	198.51.100.65 2001:db88:5a35:4a1::ab4c:882a

serverID [MsgStoreOperation]	Tables C.4
Description and requirements	*Examples*
IP address of the message server hosting the message store being manipulated. The IP address can be either IPv4 or IPv6. Preferably in text format using the element "iPTextAddress".	198.51.100.65 2001:db88:5a35:4a1::ab4c:882a

messageID	Tables C.3, C.4
Description and requirements	*Examples*
Unique identifier for the message - for example IETF RFC 5322 message-id header.	1234@local.machine.org EOCBS0045PS@host.mailcsp.com

sourceServerName [MsgTransmission]	Table C.3
Description and requirements	*Example*
Name for the server sending the message.	mailout12.atlanta.com

destinationServerName [MsgTransmission]	Tables C.3
Description and requirements	*Example*
Name for the server receiving the message.	omr.mx.biloxi.com

clientPort [MsgTransmission]	Tables C.3
Description and requirements	*Example*
Port number of the source of the message transmission.	54214

clientPort [MsgStoreOperation]	Tables C.4
Description and requirements	*Example*
Port number of the subscriber who performed the indicated operation.	54214

serverPort [MsgTransmission]	Tables C.3
Description and requirements	*Example*
Port number of the destination of the message transmission.	43578

serverPort [MsgStoreOperation]	Tables C.4
Description and requirements	*Example*
Port number of the message server hosting the message store being manipulated.	54214

operation [MsgStoreOperation]	Tables C.4
Description and requirements	*ELEMENTS*
Type of manipulation performed in the message store instance by the subscriber. The operation description can be found in ETSI TS 102 657 V2.6.1 Annex C.3	connect disconnect retrieveMsg partialretrieveMsg deleteMsg addMsg editMsg

7.4.2 HD_29_TEL Multimedia service usage request and responses

The encoding and formats of the parameters for the telephony and multimedia service usage requests and responses relate to ETSI TS 102 657 V2.6.1 Annexes A and D.

7.4.2.1 Multimedia service usage request criteria elements and structure

This section covers the request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the multimedia service usage.

Target identity for multimedia		
Element or attribute	**Description**	**Example**
equals	Request constraint	
multimediaRecord	Service = multimedia	
multimediaServiceUsage	Category = multimedia service usage	
partyInformation	XSD structure	
multimediaPartyInformation	XSD structure	
partyIdentity	SIP URI or TEL URI or E.164 number in international format.	sip:alice@atlanta.com tel:+41598889988 41598889988
iMSI	The International Mobile Subscriber Identity (IMSI) of the target. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
iMEI	The International Mobile station Equipment Identity (IMEI or IMEISV) of the target. IMEI is encoded on 8 octets to allow the 14 digits (TAC+SNR) + 1 digit of the Check Digit or the 2 digits of the Software Version (SV). The unused final digit shall be set to "F". When no SV is present or when SV is not relevant, the IMEI shall be coded with the first 14 digits + 0F at the end. See 3GPP TS 29.060 V18.0.0 clause 7.7.53.	359040082042280F

Time period interval for multimedia		
Element or attribute	**Description**	**Example**
lessThanOrEqualTo and greaterThanOrEqualTo	Request constraints defining the time period interval for the historical data.	

multimediaRecord	Service = multimedia	
multimediaServiceUsage	Category = multimedia service usage	
partyInformation	XSD structure	
multimediaPartyInformation	XSD structure	
communicationTime	XSD structure	
startTime	All communications with startTime in the given period interval in "GeneralizedTime" format.	20140410235959+0200 20140402120000+0200

7.4.2.2 Multimedia service usage response elements

This section covers the elements and fields of the Multimedia service usage records are specified in ETSI TS 102 657 V2.6.1 Annex D.2.4 with the following requirements and examples:

partyRole	Table D.6
Description and requirements	*ELEMENTS*
Role for the party (e.g., called, calling, redirecting, smsOriginator, etc…).	calling called calledAssertedIdentity calledApplicationServer originalCalled redirecting multimediaNetworkIndependent directory broadcastReceiver broadcastSender originalCalling forwarded-to-Party connected userProvidedCalling roaming translated singlePersonalNumber smsOriginator smsRecipient smsOriginatorTrn smsRecipientTrn mmsOriginator mmsRecipient mmsOriginatorTrn mmsRecipientTrn

partyIdentity	Table D.6
Description and requirements	*Examples*
E.164 address of the party in international format, or SIP URI or TEL URI representing E.164 (11/10)	493855667788 sip:+41315556677@provider.ch tel:+41752001009

communicationTime	Table D.6
Description and requirements	
The date and time of the beginning of the communication and its duration in seconds. The communicationTime structure is composed of the following elements: 1) startTime, 2) endTime or 3) duration:	
1) startTime	Annex A.3.3
Description and requirements	*Examples*
The calendar date and time of the beginning of the communication with at least a precision to the second. It shall be in local time with indication of the time zone relative to UTC or in UTC time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (02/21).	20140406145234+0200 20140615092545+0200 20140712160841.2+0200 20170710143523Z
2) endTime	Annex A.3.3
Description and requirements	*Examples*
The calendar date and time of the end of the communication with at least a precision to the second. It shall be in local time with indication of the time zone relative to UTC or in UTC time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (02/21).	20140214225215+0100 20140615092618+0200 20140712161528.7+0200 20170710144216Z
3) durationTime	Annex A.3.3
Description and requirements	*Example*
The duration of the communication session in seconds (i.e., one number representing the total amount of seconds of the duration of the communication session). In case of the target having forwarded a call and not being part of the call itself, the respective empty XML-element can be omitted.	248

natureOfAddress	Table D.6
Description and requirements	*Examples*
Corresponds to the nature of address indicator or type of number of the ITU-T E.164 (11/10) number of the party. Optionally the nature of address element may complement the “partyNumber” element in order to avoid any ambiguity.	International National Unknown

iMSI	Table D.6
Description and requirements	*Example*
The International Mobile Subscriber Identity (IMSI) of the target. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F

partyNumber	Table D.6
Description and requirements	*Examples*
Number for the party in ITU-T E.164 (11/10) format. This number can represent a fix number or a MSISDN.	493855667788

naAssignedAddress	Table D.6
The naAssignedAddress structure shall be composed of the following 3 elements: 1) set of IPAddress, 2) portNumber and 3) addressType. In case of Non-3GPP access this structure can also be used to provide the “UE-local-IP-address” and the corresponding protocol port (e.g. “UDP-source-port”) reported from the ePDG.	
1) IPAddress	Annex E.3
Description and requirements	*Examples*
The IPv4 address or IPv6 prefix used by the subscriber's client for the connection. Preferably in text format using the element "iPTextAddress".	198.51.100.24 2001:DB8:A125:C27B
2) portNumber	Annex E.3
Description and requirements	*Examples*
The outbound protocol port number.	22545
3) addressType	Annex E.3
Description and requirements	*ELEMENTS*
The type of IP address.	unknown internal external

accessNetworkInformation	Table D.6
The accessNetworkInfo is composed of the PaniHeaderInfo structure. It is used for the PS access network and the CS domain. The PaniHeaderInfo is composed of the following 6 optional elements: 1) accessType, 2) accessClass, 3) networkProvided, 4) paniLocation, 5) paniTime, 6) paniHeaderContent Note: The content and syntax of the accessNetworkInfo are specified in ETSI TS 132 298 V18.9.0 clause 5.1.3.1.2 and ETSI TS 124 229 V18.8.0 clause 7.2A.4	
1) accessType	Annex D.3
Description and requirements	*Examples*
The accessType element shall be set according to the appropriate access technology that was in use. ASCII string encoded in hexBinary.	334750502D452D555452414E2D544444 (*ASCII ≡ 3GPP-E-UTRAN-TDD*) 494545452D3830322E313167 (*ASCII ≡ IEEE-802.11g)*
2) accessClass	Annex D.3

Description and requirements	*Examples*
The accessClass element shall be set according to the appropriate access technology that was in use.	334750502D574C414E (*ASCII ≡ 3GPP-WLAN*) 334750502D48535041 (*ASCII ≡ 3GPP-HSPA*)
3) networkProvided	Annex D.3
Description and requirements	
Indicates whether the accessNetworkInfo elements are provided by the network or not.	
4) paniLocation	Annex D.3
General requirements	

When the target had an access-type or access-class that was mobile or non-3GPP or wireless lan, the location information of the cell antenna serving the target or the access point serving the target shall be provided at the beginning and at the end of the session for each multimedia session that took place within the period for which historical data was requested.
When the target had an access-type or access-class that was a wireline access (e.g. Cable modem, xDSL, FTTx) only the postal location elements shall be provided, if available.
The identities and geographical coordinates of temporary cells, such as Cell on Wheels (CoW), that are deployed for special events must be reported. However, moving cells, repeaters and relays mounted on vehicles such as buses, trains or airplanes or onboard satellites are excluded.
When the mobile 3GPP location information is a cell composed of several fixed antennas (e.g. with fixed repeaters or relays) distributed in different geographical locations but sharing the same cell identity, a specific Location structure is specified and named “combined cell” in order to deliver all the geographical coordinates and postal locations pertaining to the antennas composing the combined cell. The “Combined cell” specific structure can be used for E-UTRAN and NR radio access technologies.

The location information structure may be composed of four main information structures: 1) Cell and area identity, 2) Geographical coordinates, 3) Postal location 4) Combined cell.

Depending on the access-type or access-class used by the target, the following location information elements and fields may be delivered in the session records:
<u>Mobile PS network access and circuit-switch (CS) domain:</u>
GERAN radio access technology for both PS network access and CS domain:
1) Cell and area identity elements: globalCellID
2) Geographical coordinates elements: gsmLocation
3) Postal location elements: any available field
UTRAN radio access technology for both PS network access and CS domain:
1) Cell and area identity elements: globalCellID and/or sAI
2) Geographical coordinates elements: gsmLocation
3) Postal location elements: any available field
E-UTRAN radio access technology:
1) Cell and area identity elements: eCGI, tAI, userLocationInformation
2) Geographical coordinates elements: gsmLocation
3) Postal location elements: any available field
4) Combined cell
NR radio access technology:
1) Cell and area identity elements: nCGI, trackingAreaIdentifier
2) Geographical coordinates elements: gsmLocation
3) Postal location elements: any available field

4) Combined cell

Non-3GPP access to 5G core stand-alone:
1) Access identity elements: n3gppaLocation
2) Geographical coordinates elements, if available: gsmLocation
3) Postal location elements, if available: any available field

Wireless LAN network access:
Wi-Fi® hotspot access:
1) Basic Service Set Identification (BSSID)
2) Geographical coordinates elements, if available: gsmLocation
3) Postal location elements, if available: any available field

Wireline network access:
Cable modem, xDSL, FTTx access:
3) Postal location elements, if available: any available field

1) Cell and area identity elements	
globalCellID	Table B.11
Description and requirements	*Example*
Cell Global Identity (CGI) serving the target. The CGI may be used for GERAN and UTRAN mobile PS network access. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets)	22F8901D50BB59 *[in hexadecimal format]*
sAI	Table B.11
Description and requirements	*Example*
Serving Area Identifier (SAI) is used to identify an area consisting of one or more cells belonging to the same Location Area. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+SAC(2 octets)	22F890FEDC8212 *[in hexadecimal format]*
eCGI	Table B.11
Description and requirements	*Example*
E-UTRAN Cell Global Identity (ECGI) serving the target in E-UTRAN mode. Only applicable for circuit switched traffic case such as SMS over SGs as specified in 3GPP TS 23.272 V18.0.0 First octet "07" represents the length in octets. MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0)	0722F890056C8720 *[in hexadecimal format]*
tAI	Table B.11
Description and requirements	*Example*
Tracking Area Identity (TAI) serving the target in E-UTRAN mode. Only applicable for circuit switched traffic case such as SMS over SGs as specified in 3GPP TS 23.272 V18.0.0 First octet "05" represents the length in octets. MCC(2 octets)+MNC(1 octet)+TAC(2 octets)	0522F89035B7 *[in hexadecimal format]*
userLocationInformation	Table B.11
Description and requirements	*Example*

This field is to be used only for IMS-based VoIP using E-UTRAN. It is composed of the Tracking Area Identifier (TAI) and the E-UTRAN Cell Global Identification (ECGI) components. First octet represents the flags as specified in 3GPP TS 29.274 V18.8.0 clause 8.21. MCC(2 octets)+MNC(1 octet)+TAI(2 octets)+MCC(2octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0)	1822F899123422F89907654321 *[in hexadecimal format]*
bSSID	Table B.11
Description and requirements	*Example*
The Basic Service Set Identification of the WLAN Access Point. Equivalent to the MAC address of the Access Point.	001B44113AB7 *[in hexadecimal format]*
trackingAreaIdentifier	Table B.11
Description and requirements	*Example*
The "Tracking Area Identity" is coded in accordance with 3GPP TS 29.274 V18.8.0 cl. 8.21.4 and the 5G TAI see 3GPP TS 23.003 V18.7.0 clause 28.6. This element shall be used only in the context of 5G NR and Multi-RAT connectivity. MCC(2 octets)+MNC(1 octet)+TAC(2 octets for E-UTRAN or 3 octets for NR)	22F899AB56E3 22F89948CF
nCGI	Table B.11
Description and requirements	*Example*
The NR Cell Global Identity (NCGI) is composed of the concatenation of the PLMN Identifier (pLMNID) and the NR Cell Identity (nRcellID) as shown in 3GPP TS 23.003 V18.7.0 clause 19.6A	
pLMNID MCC(2 octets)+MNC(1 octet)	22F899
nRcellID (encoded with 36 bits, 5 octets with most significant semi-octet as spare = 0)	0AB12CD34E
n3gppaLocation	Table B.11
Description and requirements	*Example*
Non-3GPP access user location, see 3GPP TS 29.571 V18.10.0 clause 5.4.4.10 This element is composed of the elements: n3gppTai, n3IwfId, ueIpv4Addr or ueIpv6Addr, portNumber.	22F899AC7D7622F899ABC2-198.51.100.1-49345
n3gppTai Non-3GPP TAI used in the PLMN. MCC(2 octets)+MNC(1 octet)+TAC(3 octets)	22F899AC7D76
n3IwfId N3IWF identifier received over NGAP MCC(2 octets)+MNC(1 octet)+N3IWF-ID(2 octets).	22F899ABC2
ueIpv4Addr UE local IPv4 address (used to reach the N3IWF)	

iPTextAddress	198.51.100.1
ueIpv6Addr UE local IPv6 address (used to reach the N3IWF).	
iPTextAddress	2001:DB8:7401::bdd7
portNumber UDP or TCP source port number	49345
2) Geographical coordinates elements	
gsmLocation	Table B.11
Description and requirements	*Examples*
The formats of the following elements (latitude, longitude and azimuth) are defined in detail in ETSI TS 102 657 V2.6.1 Annex B.3. The geographical coordinates of the antenna serving the target shall be indicated according to the WGS84 World Geodetic System. When a cell is composed of several azimuth directions or when it is omnidirectional the corresponding azimuth element shall be omitted. <u>Elements:</u> latitude [XDDMMSS.SS] longitude [XDDDMMSS.SS] mapDatum azimuth	 N465648.10 E0072650.80 wGS84 270
3) Postal location elements	
buildingNumber	Annex A.3.3
Description and requirements	*Examples*
The building number where the cell or hotspot antenna serving the target is located. If this information is not available in this field, it can be provided in the streetname field.	127 4a
streetName	Annex A.3.3
Description and requirements	*Examples*
The name of the street or place or road where the cell or hotspot antenna serving the target is located. When an antenna is located in a rural area along a road or highway, the name of the road shall be provided in this element.	route de Versoix Bärenplatz Autobahn A5 km38 Langstrasse 15 Note: UTF-8 coding is preferred.
postalCode	Annex A.3.3
Description and requirements	*Examples*
Postal code of the location where the cell or hotspot antenna serving the target is located.	3011
city	Annex A.3.3
Description and requirements	*Examples*
The name of the city, village or area (as applicable) where the cell or hotspot antenna serving the target is located.	Bern Zürich Lugano

When an antenna is located in a rural area that is not near a road or highway, the name of the municipality where it is situated shall be provided in this element.	Note: UTF-8 coding is preferred.
country	Annex A.3.3
Description and requirements	*Examples*
The country information shall be provided only for outbound roaming sessions, i.e., sessions of a mobile CSP customer roaming abroad. It shall be formated according to ISO-3166-1 (2013).	CH DE FR IT
4) combined cell	
extendedLocation region cornerMarks Spot **gsmLocation** Spot **postalLocation**	Specific structure to deliver the geographical coordinates and postal location elements of each antenna (e.g. repeater or relay) composing the combined cell.
5) paniTime	Annex D.3
General requirements	*Examples*
Indicates the time when the location was reported at the start of the session, at the end of the session. It shall be in local time with indication of the time zone relative to UTC or in UTC time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (02/21).	20140214225215+0100 20140615092618+0200 20140712161528.7+0200 20170710144216Z
6) paniHeaderContent	Annex D.3
General requirements	*Example*
Complete content of the P-Access-Network-Info header field. Optionally, the paniHeaderContent can be provided when the Access Network Info is present in the record. In case of non-3GPP access the “UE-local-IP-address” and the “UDP-source-port” resp. “TCP-source-port” shall be provided.	334750502d452d555452414e2d464444 3b757472616e2d63656c6c2d69642d33 6770703d323238303961303238303237 333230343b227362632d646f6d61696e 3d6b616c623031706373636633033223b 2275652d69703d31302e3232342e3330 2e3738223b2275652d706f72743d3738 3031220d0a *(ASCII ≡ 3GPP-E-UTRAN-FDD;utran-cell-id-3gpp=22809a0280273204;"sbc-domain=kalb01pcscf03";"ue-ip=10.224.30.78";"ue-port=7801")*

cellularNetworkInformation	Table D.6
The cellularNetworkInfo structure contains the content of one SIP "Cellular Network-Info" header, when the target UE is supporting one or more cellular radio access technologies but is using a non-cellular IP-CAN, such as untrusted WLAN access, e.g. VoWiFi. It	

provides the radio cell identity of the cellular radio access network on which the UE most recently camped. CellularNetworkInfo is composed of the following 3 optional elements: 1) accessType, 2) cellularAccessInfo, 3) cniHeaderContent Note: The content and syntax of the cellularNetworkInfo are specified in ETSI TS 132 298 V18.9.0 clause 5.1.3.1.11A and ETSI TS 124 229 V18.8.0 clause 7.2.15	
1) accessType	Annex D.3
Description and requirements	*Example*
The accessType element shall be set according to the appropriate access technology that was in use. ASCII string encoded in hexBinary.	334750502D452D555452414E2D544444 (*ASCII ≡ 3GPP-E-UTRAN-TDD*)
2) cellularAccessInfo The CellularAccessInfo sequence is composed of the five following parameters:	Annex D.3
cgi3gpp	
Description and requirements	*Example*
To provide the cgi-3gpp value for GERAN access according to the syntax specified in ETSI TS 124 229 V18.8.0 clause 7.2.15.7. ASCII string encoded in hexBinary.	63 67 69 2d 33 67 70 70 3d 32 32 38 30 39 61 33 34 62 38 61 65 35 *(ASCII ≡ cgi-3gpp=22809a34b8ae5)*
utranCellId3gpp	
Description and requirements	*Example*
To provide the utran-cell-id-3gpp value for UTRAN or E-UTRAN or NR access according to the syntax specified in ETSI TS 124 229 V18.8.0 clause 7.2.15.7. ASCII string encoded in hexBinary.	75 74 72 61 6e 2d 63 65 6c 6c 2d 69 64 2d 33 67 70 70 3d 32 32 38 30 39 61 30 32 38 30 32 37 33 32 30 34 *(ASCII ≡ utran-cell-id-3gpp=22809a0280273204*
ci3gpp2	
Description and requirements	*Example*
Not used: there is no cgi-3gpp2 3GPP2-based cellular access in Switzerland.	Not Applicable
ci3gpp2femto	
Description and requirements	*Example*
Not used: there is no cgi-3gpp2-femto 3GPP2-based cellular access in Switzerland.	Not Applicable
cellInfoAge	
Description and requirements	*Example*
To provide the cell-info-age value that indicates the relative time in seconds since the information about the cell identity was collected by the UE. The value of the parameter is an INTEGER number from 1 to 9 digits according to the syntax specified in ETSI TS 124 229 V18.8.0 clause 7.2.15.7.	123
3) cniHeaderContent	Annex D.3
Description and requirements	*Example*

Complete content of the Cellular-Network-Info header field specified in ETSI TS 132 298 V18.9.0 clause 5.1.3.1.11A and ETSI TS 124 229 V18.8.0 clause 7.2.15. ASCII string encoded in hexBinary.	33 47 50 50 2d 45 2d 55 54 52 41 4e 2d 46 44 44 3b 75 74 72 61 6e 2d 63 65 6c 6c 2d 69 64 2d 33 67 70 70 3d 32 32 38 30 39 61 30 32 38 30 32 37 33 32 30 34 3b 63 65 6c 6c 2d 69 6e 66 6f 2d 61 67 65 3d 31 32 33 0d 0a *(ASCII ≡ 3GPP-E-UTRAN-FDD;utran-cell-id-3gpp=22809a0280273204;cell-info-age=123)*

privateUserIdentity	Table D.6
Description and requirements	*Example*
Private User Identity (IMPI) associated with the party.	joe.muster@example.com

iMEI	Table D.6
Description and requirements	*Example*
The International Mobile Station Equipment Identity (IMEI or IMEISV) of the target. IMEI is encoded on 8 octets to allow the 14 digits (TAC+SNR) + 1 digit of the Check Digit or the 2 digits of the Software Version (SVN). The unused final digit shall be set to "F". When no SV is present or when SV is not relevant, the IMEI shall be coded with the first 14 digits + 0F at the end. See 3GPP TS 29.060 V18.0.0 clause 7.7.53.	3568431553965790F

reasonCause	Table D.5
Description and requirements	*Examples*
In case of VoIP and IMS Multimedia telephony the SIP Reason Cause code at the end of the communication. The codes are assigned by IANA at www.iana.org. In case a mapping between the ITU-T Rec. Q.850 (10/18) cause and a SIP reason cause is necessary, the reasonCause shall be populated with the SIP reason cause mapped to the cause value of the ITU-T Rec. Q.850 as specified in ITU-T Rec. Q.1912.5 (01/2018). The ITU-T Rec. Q.850 (10/18) cause “16 - Normal call clearing” shall be mapped to the SIP reason cause 200 denoting the successful termination of the SIP BYE method. If DSS1 causes of ITU-T Rec. Q.850 (10/18) which are not mentioned in ITU-T Rec. Q.1912.5 (01/2018) or proprietary causes are used, the CSP shall inform PTSS about the mapping used and the corresponding description of the causes.	410 200

bearerService	Table D.5
Description and requirements	*ELEMENTS*
The bearer service for the communication as MultimediaBearerService.	speech data

	fax video emergencyCall

callID	Table D.5
Description and requirements	*Example*
Identifier of the retained call data, e.g., SIP callID, for correlating data from different DR sources in CSP.	a84b4e66710@pc33.atlanta.com

contentType	Table D.5
Description and requirements	*Examples*
List of the media type of the message body.	application/sdp application/vnd.3gpp.sms text/html

mediaComponents	Table D.2.4.4
Description and requirements	
The mediaComponents structure shall contains the following 5 elements listed below: 1) time, 2) mediaName, 3) mediaDescription, 4) mediaInititiator and 5) accessCorrelationID.	
1) time	Table D.8
Description and requirements	*Example*
Time when this media component has been processed.	20140406145238+0200
2) mediaName	Table D.8
Description and requirements	*Examples*
Media component name in the SDP data of the 200 OK message (from "m=" line in SDP data as in IETF RFC 4566).	audio video text application message image
3) mediaDescription	Table D.8
Description and requirements	*Examples*
The media component description specifies the media described in the SDP media name (from "attribute-line" (i=, c=, b=, k=, a=, etc...) content in SDP data of the 200 OK message, as in IETF RFC 4566.	m=audio 49174 RTP/AVP 8 a=rtpmap:96 L8/8000 c=IN IP4 192.0.2.14/127/2
4) mediaInitiator	Table D.8
Description and requirements	*Examples*
Media component initiator.	calling Party called Party
5) accessCorrelationID	Table D.8
Description and requirements	*Example*

Correlation identifier for the access used for SIP usage. This field holds the charging identifier of the access network. For GPRS and I-WLAN access, this shall be the GPRS Charging ID, for EPS, this shall be the charging ID and for other access networks this shall be the Access Network Charging Identifier Value.	87A3284CD6

imsInformation	Table D.7
Description and requirements	
This ImsInformation structure is used for service usage information in case of IMS service	
1) service	Table D.7
Description and requirements	*ELEMENTS*
Type of IMS service used by subscriber. The attribute "session" shall be used when the SIP method INVITE has been used to initiate a session. The attribute "message" when the SIP method MESSAGE has been used for Instant Messaging. The attribute "refer" when the SIP method REFER has been used, for instance for a session transfer. If other SIP methods are used the attribute shall be omitted.	session message refer
2) roleOfNode	Table D.7
Description and requirements	*ELEMENTS*
Specification on the role of the Data Retention Source in the reported communication. Only the attributes "originating" or "terminating" shall be used.	originating terminating

reason	Table D.5
Description and requirements	*Examples*
Text description of the call status	Answered call Unsuccessful call attempt

smsInformation	Table D.5
Description and requirements	
The smsInformation structure is filled in when a SMS is involved in the communication. The parameters are as follows:	
1) smsEvent	Table B.7
Description and requirements	*ELEMENTS*
Type of message event: - Regular short message - Part of a composite short message - Composite short message - Notification short message	 shortMessage shortPartMessage compositeMessage notificationMessage
2) smsType	Table B.7
Description and requirements	*ELEMENTS*

Type of short message transferred on the interface between the Short Message-Center (SC) and the Mobile Station (MS). Elements to use to indicate the SMS procedure: For MO-SM submitted successfully: submitMStoSC For MO-SM submitted failure: submitMStoSC For MT-SM delivered successfully: deliverSCtoMS For MT-SM delivery failure: deliverSCtoMS	deliverSCtoMS deliverReportMStoSC statusReportSCtoMS commandMStoSC submitMStoSC submitReportSCtoMS reservedMTIValue
3) smsStatus	Table B.7
Description and requirements	*ELEMENTS*
Status reached by the short message (SM) Elements to use to indicate the SMS procedure status: For MO-SM submitted successfully: submitted For MO-SM submitted failure: incomplete-submission For MT-SM delivered successfully: delivered For MT-SM delivery failure: incomplete-delivery	delivered expired deleted replaced submitted incomplete-submission incomplete-delivery undeliverable passed-on

mmsInformation	Table D.5
Description and requirements	
The mmsInformation structure is filled in when a MMS is involved in the communication. The parameters are as follows:	
1) mmsEvent	Table B.8
Description and requirements	*ELEMENTS*
Type of message exchanged: - Regular multimedia message - Multimedia notification message - Multimedia delivery report message - Multimedia read reply message	message notificationMessage deliveryReportMessage readReplyMessage
2) mmsStatus	Table B.8
Description and requirements	*ELEMENTS*
Status reached by the multimedia message (MMS)	delivered expired deleted replaced submitted undeliverable passed-on delivery-rejection delivery-forward delivery-copy submission-rejection submission-failure delivered-application

trunkGroupIDs	Table D.5
Description and requirements	
The incoming and outgoing trunk group IDs for the session/call. Format of values as defined by the CSP.	
1) incomingTrunkGroupID	
Description and requirements	*ELEMENTS*
Identity of the incoming PSTN leg. Format as defined by the CSP.	TGISWE01 FRA332 21804
2) outgoingTrunkGroupID	
Description and requirements	*ELEMENTS*
Identity of the outgoing PSTN leg. Format as defined by the CSP.	TGISWE01 FRA332 21804

interOperatorIDs	Table D.5
Description and requirements	
The originating, terminating and transit interoperator identifiers (orig-ioi, term-ioi and transit-ioi-list) in IETF RFC 7315 format, as recorded in the SIP header P-Charging-Vector.	
1) originatingInterOperatorID	
Description and requirements	*ELEMENTS*
Originating Inter Operator Identifier `orig-ioi` formated as defined in IETF RFC 7315 and 3GPP TS 32.260 V18.3.0	ims.mnc099.mcc228.3gppnetwork.org IMSSTB_32 Orange_FR
2) terminatingInterOperatorID	
Description and requirements	*ELEMENTS*
Terminating Inter Operator Identifier term-ioi, formated as defined in IETF RFC 7315 and 3GPP TS 32.260 V18.3.0	ims.mnc099.mcc228.3gppnetwork.org IMSSTB_32 Orange_FR
3) transitInterOperatorIDList	
Description and requirements	*ELEMENTS*
Transit Inter Operator Identifier `transit-ioi-list`, formated as defined in IETF RFC 7315 and 3GPP TS 32.260 V18.3.0	Orange_FR.1 IMSSTB_32.1

7.4.3 HD_28_NA Network access service usage request and responses

The encoding and formats of the parameters for the network access service usage requests and responses relate to ETSI TS 102 657 V2.6.1 Annexes A and E.

7.4.3.1 Network access service usage request criteria elements and structure

This section covers the request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the network access service usage.

Depending on the type of network access, fixed or mobile, the target identity is requested in two different ways:

Target identity for fixed network access		
Element or attribute	**Description**	**Example**
equals	Request constraint	
networkAccess	Service = network access	
naServiceUsage	Category = network access service usage	
naAuthID	Username used to obtain the fix network access.	alice@cablecsp.ch 41593526987

Target identity for mobile network access		
Element or attribute	**Description**	**Example**
equals	Request constraint	
networkAccess	Service = network access	
naServiceUsage	Category = network access service usage	
naAuthID	Username used to obtain the fix or wireless network access	joe@example.com
naAssignedAddress	SEQUENCE OF	
addressSetOrRangeOrMask	CHOICE	
set	IP address set	
iPTextAddress	IPv4 or IPv6 address set	198.51.100.25 2001:DB8:7401::bdd7
range	Range of IP addresses	
prefix		
iPTextAddress	IPv4 or IPv6 prefix	172.16.10.0 2001:DB8:1234::
subnetlength	IPv4 or IPv6 subnet length, value equal to the size in bits of the prefix	26 48
ePSInformation	The target identity is related to a mobile network access based on GPRS and/or EPS.	
iMSI	The International Mobile Subscriber Identity (IMSI) of the target. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
mSISDN	MSISDN number of the mobile target.	
PartyNumber		41751112233
iMEISV	The International Mobile Station Equipment Identity (IMEI) of the target.	
IMEI		356843155396570F

fiveGSInformation	The target identity is related to a mobile network access based on 5G system	
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
pEI	CHOICE	
iMEI	The International Mobile Station Equipment Identity (IMEI) of the target.	359040082042280F
iMEISV	The International Mobile Station Equipment Identity (IMEI) with Software Version of the target.	3571600455770051
mACAddress	The MAC address of the device.	A12345678D5B
eUI64	The 64-Bit Extended Unique Identifier (EUI-64) of the device.	A32345FFFE678D5B

Time period interval for fixed or mobile network access		
Element or attribute	**Description**	**Example**
lessThanOrEqualTo and greaterThanOrEqualTo	Request constraints defining the time period interval for the historical data.	
networkAccess	Service = network access	
naServiceUsage	Category = network access service usage	
interval	XSD structure	
startTime	All communications with startTime in the given period interval in “GeneralizedTime” format.	20140427220000+0200 20140401120000+0200

7.4.3.2 Network access service usage response elements

This section covers the elements and fields of the Network access service usage records are specified in ETSI TS 102 657 V2.6.1 Annex E.2.4 with the following requirements and examples:

naAuthID	Table E.3
Description and requirements	*Examples*
Logon name (username) used to obtain network access. This identifier can take many different forms as there are numerous authentication methods possible. The identifier shall be provided as UTF8String.	bob alice@cablecsp.ch 41752223399 sms_41752223399

nwAccessType	Table E.3
Description and requirements	*ELEMENTS*
Type of network access attempted. If not undefined, this should be one of the types supported by the Network Access Server (NAS).	undefined dialUp xDSL cableModem lAN wirelessLAN wimax mobilePacketData

naStatus	Table E.3
Description and requirements	*ELEMENTS*
Results of the network access attempt.	unknown succeeded failed rejected

interval	Table E.3
Description and requirements	
The Start time and end time of network access. Used only if naStatus indicates a success. Specificities in case of Mobile PS access: For GERAN and UTRAN the “startTime” and "endTime" of the network access session correspond to the activation, respectively the deactivation, of a primary PDP context, as specified in 3GPP TS 23.060 V18.0.0. For E-UTRAN and E-UTRAN-NR Dual Connectivity the "startTime" and "endTime" of the network access session correspond to the activation, respectively the deactivation, of the default bearer or tunnel, as specified in 3GPP TS 23.401 V18.8.0 and 3GPP TS 23.402 V18.3.0. For NR the "startTime" and "endTime" of the network access session correspond to the activation, respectively the deactivation, of the PDU session or tunnel, as specified in 3GPP TS 23.501 V18.10.0 and 3GPP TS 23.502 V18.10.0. Note: In case of roaming session the GPRS “Call Event Start Timestamp” provided by the visited serving mobile network is in local time. In order that this local time can	

be equated with the time in the home network, the difference between local time and UTC Time is supplied with the attribute “UTC Time Offset” defined as Local Time minus UTC Time. Examples: Visited serving network: USA, location: Washington DC Local time: 1000hrs UTC Time: 1500hrs UTC Time Offset: 10 -15 = -5 Where dates are different, 24 hours are added to the time of the greater date. Visited serving network: Australia, location: Sydney Local time: 0100hrs UTC Time: 1500hrs UTC Time Offset: (01+24) -15 = +10 The interval structure is composed of the following elements: 1) startTime and 2) endTime or 3) duration:	
1) startTime	Table E.3
Description and requirements	*Examples*
The calendar date and time of the beginning of the network access with at least a precision to the second. It shall be in local time with indication of the time zone relative to UTC or in UTC time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (02/21).	20140310145234+0100 20140615092545+0200 20140712160841.2+0200 20170710143523Z
2) endTime	Table E.3
Description and requirements	*Examples*
The calendar date and time of the end of the network access with at least a precision to the second. It shall be in local time with indication of the time zone relative to UTC or in UTC time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (02/21).	20140310152812+0100 20140615132834+0200 20140713023403.2+0200 20170710160642Z
3) durationTime	Table E.3
Description and requirements	*Example*
The duration of the communication session in seconds (i.e., one number representing the total amount of seconds of the duration of the communication session).	185

naDeviceID	Table E.3
Description and requirements	*Examples*
Information on the device used to access the service, if available. Depending on the type of network access, the device identification can be for example a MAC	a1:23:45:67:8d:5b 357160045577005

address in case of cable modem or wlan access or an IMEI in case of Mobile PS access. It shall be provided as UTF8String.	

naAssignedAddress	Table E.3
The naAssignedAddress structure shall be composed of the following 3 elements: 1) set of IPAddress, 2) portNumber and 3) addressType. In case of Non-3GPP access this structure can also be used to provide the “UE-local-IP-address” and the corresponding protocol port (e.g. “UDP-source-port”) reported from the ePDG.	
1) IPAddress	Table E.3
Description and requirements	*Examples*
The IPv4 address or IPv6 prefix used by the subscriber's client for the connection. Preferably in text format using the element "iPTextAddress".	198.51.100.24 2001:DB8:A125:C27B
2) portNumber	Table E.3
Description and requirements	
The outbound protocol port number	22545
3) addressType	Table E.3
Description and requirements	*ELEMENTS*
The type of IP address.	unknown internal external

Location and additionalLocations	Table E.3
General requirements	
The location information corresponds to the location of the cell antenna serving the mobile PS target or the location of the access point serving a target by wireless lan (wlan). The location information at the beginning and at the end of the session as well as, when available, during the session must be provided for each network access session that took place within the period for which historical data was requested. The location information during and at the end of the session must be provided with the additionalLocations element or with the location information provided by the NAS messages as specified in 7.4.3.2.1. The identities and geographical coordinates of temporary cells, such as Cell on Wheels (CoW), that are deployed for special events must be reported. However, moving cells, repeaters and relays mounted on vehicles such as buses, trains or airplanes or onboard satellites are excluded. When the mobile 3GPP location information is a cell composed of several fixed antennas (e.g. with fixed repeaters or relays) distributed in different geographical locations but sharing the same cell identity, a specific Location structure is specified and named “combined cell” in order to deliver all the geographical coordinates and postal locations pertaining to the antennas composing the combined cell. The “Combined cell” specific structure can be used for E-UTRAN and NR radio access technologies. The location information structure may be composed of six main information structures: 1) Cell and area identity, 2) Geographical coordinates, 3) Postal location, 4) Combined cell 5) maritimeTransport and 6) airTransport.	

When the mobile 3GPP access location information is obtained by the CSP via the messages exchanged on the Non-Access Stratum (NAS) interface between the UE and the Core network, a specific structure for Location is specified in the section 7.4.3.2.1 of this document.

Depending on the network access technology used by the target, the following location information elements and fields may be delivered in the session records:
Mobile PS network access:
GERAN radio access technology:
1) Cell and area identity elements: globalCellID or userLocationInformation
2) Geographical coordinates elements: gsmLocation
3) Postal location elements: any available field
4) Maritime transport
5) Air transport
UTRAN radio access technology:
1) Cell and area identity elements: globalCellID and/or sAI or userLocationInformation
2) Geographical coordinates elements: gsmLocation
3) Postal location elements: any available field
4) Maritime transport
5) Air transport
E-UTRAN radio access technology:
1) Cell and area identity elements: userLocationInformation
2) Geographical coordinates elements: gsmLocation
3) Postal location elements: any available field
4) Combined cell
5) Maritime transport
6) Air transport
NR radio access technology:
1) Cell and area identity elements: nCGI, trackingAreaIdentifier
2) Geographical coordinates elements: gsmLocation
3) Postal location elements: any available field
4) Combined cell

Non-3GPP access to 5G core stand-alone:
1) Access identity elements: n3gppaLocation
2) Geographical coordinates elements, if available: gsmLocation
3) Postal location elements, if available: any available field

Wireless LAN network access:
Wi-Fi® hotspot access:
1) Basic Service Set Identification (BSSID)
2) Geographical coordinates elements, if available: gsmLocation
3) Postal location elements, if available: any available field
4) Maritime transport
5) Air transport

Wireline network access:
Cable modem, xDSL, FTTx access:
3) Postal location elements, if available: any available field

1) Cell and area identity elements	
globalCellID	Table B.11
Description and requirements	*Example*

Cell Global Identity (CGI) serving the target. The CGI may be used for GERAN and UTRAN mobile PS network access. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets)	22F8901D50BB59 *[in hexadecimal format]*
sAI	Table B.11
Description and requirements	*Example*
Serving Area Identifier (SAI) is used to identify an area consisting of one or more cells belonging to the same Location Area. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+SAC(2 octets)	22F890FEDC8212 *[in hexadecimal format]*
userLocationInformation	Table B.11
Description and requirements	*Example*
This field is used for E-UTRAN network access and is composed of the Tracking Area Identifier (TAI) and the E-UTRAN Cell Global Identification (ECGI) components. First octet represents the flags as specified in 3GPP TS 29.274 V18.8.0 clause 8.21. MCC(2 octets)+MNC(1 octet)+TAI(2 octets)+MCC(2octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0) Alternatively, this element can also be used for providing the area and cell identity for GERAN or UTRAN network access. In this case there is no need to provide the globalCellID or sAI fields in the Location structure.	1822F899123422F89907654321 *[in hexadecimal format]*
bSSID	Table B.11
Description and requirements	*Example*
The Basic Service Set Identification of the WLAN Access Point. Equivalent to the MAC address of the Access Point. Note: This bSSID parameter shall represent the BSSID of the WLAN access point the target has used during the network access session. There can be several bSSID instances if the target has moved between different WLAN access points.	001B44113AB7 *[in hexadecimal format]*
nCGI	Table B.11
Description and requirements	*Example*
The NR Cell Global Identity (NCGI) is composed of the concatenation of the PLMN Identifier (pLMNID) and the NR Cell Identity (nRcellID) as shown in 3GPP TS 23.003 V18.7.0 clause 19.6A	
pLMNID [MCC(2 octets)+MNC(1 octet)]	22F899
nRcellID [encoded with 36 bits, 5 octets with most significant semi-octet as spare = 0]	0AB12CD34E
trackingAreaIdentifier	Table B.11
Description and requirements	*Example*
The "Tracking Area Identity" is coded in accordance with 3GPP TS 29.274 V18.8.0 cl. 8.21.4 and the 5G TAI see 3GPP TS 23.003 V18.7.0 clause 28.6.	22F899AB56E3 22F89948CF

This element shall be used only in the context of 5G NR and Multi-RAT connectivity. MCC(2 octets)+MNC(1 octet)+TAC(2 octets for E-UTRAN or 3 octets for NR)	
locationInformationSource	Table B.11
Description and requirements	*Example*
Source of the location information. When applicable, the locationInformationSource shall contain either NAS when the location information is derived from the Non-Access Stratum signalling messages or CDR when the location information is taken from the Charging Data Records.	NAS CDR
n3gppaLocation	Table B.11
Description and requirements	*Example*
Non-3GPP access user location, see 3GPP TS 29.571 V18.10.0 clause 5.4.4.10 This element is composed of the elements: n3gppTai, n3IwfId, ueIpv4Addr or ueIpv6Addr, portNumber.	22F899AC7D7622F899ABC2-198.51.100.1-49345
n3gppTai Non-3GPP TAI used in the PLMN. MCC(2 octets)+MNC(1 octet)+TAC(3 octets)	22F899AC7D76
n3IwfId N3IWF identifier received over NGAP MCC(2 octets)+MNC(1 octet)+N3IWF-ID(2 octets).	22F899ABC2
ueIpv4Addr UE local IPv4 address (used to reach the N3IWF)	
iPTextAddress	198.51.100.1
ueIpv6Addr UE local IPv6 address (used to reach the N3IWF).	
iPTextAddress	2001:DB8:7401::bdd7
portNumber UDP or TCP source port number	49345
2) Geographical coordinates elements	
gsmLocation	Table B.11
Description and requirements	*Examples*
The formats of the following elements (latitude, longitude and azimuth) are defined in detail in ETSI TS 102 657 V2.6.1 Annex B.3. The geographical coordinates of the antenna serving the target shall be indicated according to the WGS84 World Geodetic System. When a cell is composed of several azimuth directions or when it is omnidirectional the corresponding azimuth element shall be omitted. Elements: latitude [XDDMMSS.SS] longitude [XDDDMMSS.SS] mapDatum azimuth	 N465648.10 E0072650.80 wGS84 270
3) Postal location elements	
buildingNumber	
Description and requirements	*Examples*

The building number where the cell or hotspot antenna serving the target is located. If this information is not available in this field, it can be provided in the streetname field.	127 4a
streetName	
Description and requirements	*Examples*
The name of the street or place or road where the cell or hotspot antenna serving the target is located. When an antenna is located in a rural area along a road or highway, the name of the road shall be provided in this element.	route de Versoix Bärenplatz Autobahn A5 km38 Langstrasse 15 Note: UTF-8 coding is preferred.
postalCode	
Description and requirements	*Examples*
Postal code of the location where the cell or hotspot antenna serving the target is located.	3011
city	
Description and requirements	*Examples*
The name of the city, village or area (as applicable) where the cell or hotspot antenna serving the target is located. When an antenna is located in a rural area that is not near a road or highway, the name of the municipality where it is situated shall be provided in this element.	Bern Zürich Lugano Note: UTF-8 coding is preferred.
country	
Description and requirements	*Examples*
The country information shall be provided only for outbound roaming sessions, i.e. sessions of a mobile CSP customer roaming abroad. It shall be formated according to ISO-3166-1 (2013).	CH DE FR IT
4) combined cell	
extendedLocation region cornerMarks Spot **gsmLocation** Spot **postalLocation**	Specific structure to deliver the geographical coordinates and postal location elements of each antenna (e.g. repeater or relay) composing the combined cell.
5) maritimeTransport	
shipname	Table B.11
Description and requirements	*Example*
Registered ship name.	LORD OF THE SEAS
imoNumber	
Description and requirements	*Example*
International Maritime Organization (IMO) ship number: IMO prefix with 7-digit number.	IMO7812345
6) airTransport	

iATAAirlineCode	Table B.11
Description and requirements	*Examples*
Two-character designation code assigned to the airline by the International Air Transport Association (IATA).	LX WK
iCAOOperatorCode	
Description and requirements	*Example*
Three-letter designation code assigned to the aircraft operator agency by the International Civil Aviation Organization (ICAO). The iCAOOperatorCode should be used only when the aircraft operator does not have an assigned IATA airline code.	SWR EDW
aircraftRegistration	
Description and requirements	*Examples*
Aircraft identification as in the aircraft's certificate of registration.	HB-JMG N99999
flightNumber	
Description and requirements	*Example*
Flight number assigned by the airline operating the aircraft.	108

gprsInformation	Table E.3
Information specific to gprs access to be used for GERAN and UTRAN mobile PS network access. The structure is composed of the following elements:	
1) iMSI	Table E.5
Description and requirements	*Example*
The International Mobile Subscriber Identity (IMSI) associated with the network access. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
2) mSISDN	Table E.5
Description and requirements	*Example*
The MSISDN associated with the network access. It shall be provided in international format.	41751112233
3) pdp-address-allocated	Table E.5
Description and requirements	*Example*
The IP address of the primary PDP context allocated for the network access. Preferably in text format using the element "iPTextAddress".	198.51.100.121 10.1.100.200
4) aPN	Table E.5
Description and requirements	*Examples*
The Access Point Name (APN) used for the network access.	internet.mobilecsp privatenetwork.mobilecsp

5) pDP_type	Table E.5
Description and requirements	*Examples*
This field corresponds to the PDP Type Number as defined in 3GPP TS 29.060 V18.0.0 clause 7.7.27. It provides protocol specific information of the packet data network accessed by the gprs subscriber.	0001 (= ETSI / PPP) 0021 (= IETF / IPv4) 0057 (= IETF / IPv6) 008D (= IETF / IPv4v6) *[in hexadecimal format]*

ePSInformation	Table E.3
Information specific to EPS access to be used for E-UTRAN mobile PS network access. The structure is composed of the following elements:	
1) iMSI	Table E.5A
Description and requirements	*Example*
The International Mobile Subscriber Identity (IMSI) associated with the network access. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
2) iMSIUnauthenticatedFlag	Table E.5A
Description and requirements	*BOOLEAN*
The flag shall be set as TRUE if unauthenticated IMSI vs. FALSE for authenticated IMSI.	TRUE FALSE
3) mSISDN	Table E.5A
Description and requirements	*Example*
The MSISDN associated with the network access. It shall be provided in international format.	41751112233
4) iMEISV	Table E.5A
Description and requirements	*Example*
IMEISV of the Mobile Equipment (ME) used for the network access, if available.	3571600455770051
5) p-GWPLMNIdentifier	Table E.5A
Description and requirements	*Example*
Public Land Mobile Network (PLMN) identifier of the Packet Data Network Gateway (P-GW). It is composed of the MCC and MNC.	22F899 (MCC=228, MNC=99)
6) aPNNetworkID	Table E.5A
Description and requirements	*Examples*
The network identifier part of the Access Point Name (APN) used for the network access in dot representation. For instance if the complete APN is "apn1a.apn1b.apn1c.mnc99.mcc228.gprs", the network identifier part is only "apn1a.apn1b.apn1c".	internet.mobilecsp private.vpn.mobilecsp apn1a.apn1b.apn1c
7) pDP-PDNType	Table E.5A
Description and requirements	*Examples*

This field corresponds to the PDP/PDN type, i.e., IPv4, IPv6, IPv4v6, coded as in 3GPP TS 29.274 V18.8.0 clause 8.34.	01 (=IPv4) 02 (=IPv6) 03 (=IPv4v6) *[in hexadecimal format]*
8) pDP-PDNAddress	Table E.5A
Description and requirements	*Examples*
The IP address allocated for the PDP context/PDN connection, i.e., IPv4 address when PDP/PDN Type is IPv4 or IPv6 prefix when PDP/PDN Type is IPv6 or IPv4v6. Preferably in text format using the element "iPTextAddress".	198.51.100.121 10.1.100.200 2001:db8:230f:c349::67cf:29b2
9) rATType	Table E.5A
Description and requirements	*Examples*
This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station as defined in 3GPP TS 29.060 V18.0.0 clause 7.7.50, if available.	1 (=UTRAN) 2 (=GERAN) 3 (=WLAN) 4 (=GAN) 5 (=HSPA Evolution) 6 (=E-UTRAN)

fiveGSInformation	Table E.3
Information specific to 5G System access to be used for NR mobile PS network access. Note: In case of E-UTRA – NR Dual Connectivity (EN-DC) access according to 3GPP TS 37.340 V18.6.0 clause 4.1.2 the structure ePSInformation shall be used. The structure is composed of the following elements:	
1) sUPI	Table E.5C
Description and requirements	*Example*
Served SUPI associated with the network access.	
iMSI	228993035511773F
nAI	joe@example.com
2) dNN	Table E.5C
Description and requirements	*Example*
String representing a Data Network Name as defined in subclause 9A of 3GPP TS 23.003 V18.7.0. Note: The DNN is equivalent to the APN in EPS.	internet.mobilecsp private.vpn.mobilecsp
3) pEI	Table E.5C
Description and requirements	*Example*
Served PEI of the ME as specified in 3GPP TS 23.003 V18.7.0 Clause 6.4, if available.	
iMEI	359040082042280F
iMEISV	3571600455770051
mACAddress	A12345678D5B

eUI64	A32345FFFE678D5B
4) gPSI	Table E.5C
Description and requirements	*Example*
Generic Public Subscription Identifier (GPSI) associated with the session, if available.	
mSISDN	
PartyNumber	41771112233
nAI	joe@example.com
5) pDUSessionID	Table E.5C
Description and requirements	*Example*
Unsigned integer identifying a PDU session, within the range 0 to 255, as specified in clause 11.2.3.1b, bits 1 to 8, of 3GPP TS 24.007 V18.3.0, if available.	12
6) sNSSAI	Table E.5C
Description and requirements	*Examples*
Single Network Slice Selection Assistance Information (S-SNSSAI), specific to 5G System onto which the subscriber's device is connected to the service. It is made of SST (the Slice/Service Type) and of the optional SD (the Slice Differentiator). SST: Unsigned integer, within the range 0 to 255, representing the Slice/Service Type. It indicates the expected Network Slice behaviour in terms of features and services. Values 0 to 127 correspond to the standardised SST range. Values 128 to 255 correspond to the Operator-specific range. SD: 3-octet string, representing the Slice Differentiator, in hexadecimal representation. Each character in the string shall take a value of "0" to "9" or "A" to "F" and shall represent 4 bits. The most significant character representing the 4 most significant bits of the SD shall appear first in the string, and the character representing the 4 least significant bit of the SD shall appear last in the string.	252-19CDE0 29
7) pDUIPv4Address	Table E.5C
Description and requirements	*Examples*
The IPv4 address of the served SUPI allocated for the PDN connection. See 3GPP TS 32.291 V18.10.0 clause 6.1.6.2.2.11.	
iPTextAddress	198.51.100.121 10.1.100.200
8) pDUIPv6Address	Table E.5C
Description and requirements	*Examples*
The IPv6 address of the served SUPI allocated for the PDN connection. See 3GPP TS 32.291 V18.10.0 clause 6.1.6.2.2.11.	
iPTextAddress	2001:db8:230f:c349::67cf:29b2
9) pDUAddressPrefixLength	Table E.5C

Description and requirements	*Examples*
PDU Address prefix length of an IPv6 typed Served PDP Address. Not required for prefix length of 64 bits. See 3GPP TS 32.291 V18.10.0 clause 6.1.6.2.2.11.	48
10) applicationServiceProviderIdentity	Table E.5C
Description and requirements	*Examples*
Identifier of the application service provider See 3GPP TS 32.291 V18.10.0 Table 6.1.6.2.2.9-1.	PrivateNet CorporateLtd
12) serviceId	Table E.5C
Description and requirements	*Examples*
Identity of the used service. See 3GPP TS 32.291 V18.10.0 Table 6.1.6.2.1.10-1	26574
13) pDUtype	Table E.5C
Description and requirements	*Examples*
PDU type is defined in 3GPP TS 29.571 V18.10.0, it may be dual IPV4V6, IPV4, IPV6, Unstructured; Ethernet See 3GPP TS 32.291 V18.10.0 clause 6.1.6.2.2.8.	iPv4 iPv6 unstructured ethernet
14) sSCMode	Table E.5C
Description and requirements	*Examples*
Information of the Session and Service Continuity (SSC) Mode type of the target. See 3GPP TS 32.291 V18.10.0 clause 6.1.6.2.2.8.	sSCMode1 sSCMode2 sSCMode3MultiPDUSession sSCMode3Multihome
15) vPLMNId	Table E.5C
Description and requirements	*Examples*
PLMN identifier of the visited network, based on the SMF PLMN ID. If available.	22F401
16) hPLMNId	Table E.5C
Description and requirements	*Examples*
PLMN identifier of the home network, based on SUPI PLMN ID.	22F899
17) pDUSessionStartTime	Table E.5C
Description and requirements	*Examples*
The time in UTC format which represents the start of a PDU session at the SMF. See 3GPP TS 32.255 V18.7.0 clause 6.2.1.2	20190812152452Z
18) pDUSessionStopTime	Table E.5C
Description and requirements	*Examples*
The time in UTC format which represents the stop of a PDU session at the SMF. See 3GPP TS 32.255 V18.7.0 clause 6.2.1.2	20190812231136Z
19) uETimeZone	Table E.5C
Description and requirements	*Examples*
The Time Zone of where the UE was located, if available. See 3GPP TS 32.255 V18.7.0 clause 6.2.1.2 and 3GPP TS 29.571 V18.10.0 table 5.2.2.-1	-08:00 +04:00+1
20) uPFId	Table E.5C
Description and requirements	*Examples*
The UPF identifier in UUID format, function defined in 3GPP TS 23.501 V18.10.0, mentioned in 3GPP TS 32.255 V18.7.0.	4655eb25-e5c8-435a-b0ea-7460d8f28cce

21) aMFIdentifier	Table E.5C
Description and requirements	*Examples*
The AMF identifier, function defined in 3GPP TS 23.501 V18.10.0, mentioned in 3GPP TS 32.255 V18.7.0 and 3GPP TS 29.571 V18.10.0 table 5.3.2-1. Composed of the aMFRegionID, aMFSetID and aMFPointer.	
aMFRegionID	255
aMFSetID	1023
aMFPointer	63
22) rAT5Type	Table E.5C
Description and requirements	*Examples*
This field indicates the primary Radio Access Technology (RAT) type of PDU session used by the Mobile Station as defined in 3GPP TS 29.571 V18.10.0 clause 5.4.3.2, such as New Radio, Evolved Universal Terrestrial Radio Access, Wireless LAN, Virtual (Virtual shall be used if the N3IWF does not know the access technology used for an untrusted non-3GPP access), when available. Formatted as per 3GPP TS 32.291 V18.10.0 clause 6.1.6.1.	nr, eutra, wlan, virtual, nBIoT, wireline, wirelineCable, wirelineDSL, wirelinePON, lTEM, nRU, eUTRAU, trustedN3GA, trustedWLAN, uTRA, gERA, nRLEO, nRMEO, nRGEO, nROTHERSAT, nRREDCAP

wiFiInformation	Table E.3
Information specific to Wi-Fi® network access. The structure is composed of the following elements:	
1) bSSID	Table E.5B
Description and requirements	*Example*
The Basic Service Set Identification (BSSID) for the network access connection. This is also the MAC address of the WLAN access point (assuming that records are for infrastructure mode, not ad-hoc mode). Note 1: The MAC address of the target, if available, is given in the "naDeviceID" structure. Note 2: This bSSID parameter shall represent the BSSID of the WLAN access point the target has used to perform the authentication and authorization process. There can only be one bSSID instance in this structure.	001B774954FD *[in hexadecimal format]*

2) sSID	Table E.5B
Description and requirements	*Example*
The Service Set Identifier in a human readable format. If available.	CSPXY-FREE-WIFI
3) username	Table E.5B
Description and requirements	*Example*
Username as seen and recorded by the CSP. Note: The username does not need to be verified in any way.	john.doe
4) locationOfAccessPoint	Table E.5B
Description and requirements	*Examples*
Location information of the Access Point. It shall be populated as lat/long, grid reference with the "gsmLocation" structure: latitude [XDDMMSS.SS] longitude [XDDDMMSS.SS] mapDatum and/or the postal address with the "postalLocation" structure: buildingNumber streetName postalCode city	 N465648.10 E0072650.80 wGS84 40 Rue Lieu 9999 Ortdorf
5) authenticationType	Table E.5B
Description and requirements	*ELEMENTS*
This element describes by which method the target performed authentication to obtain the Wi-Fi® network access.	authenticationBySMS authenticationByCookie authenticationByMACAddress authenticationByEAPSIM authenticationByUsernameAndPassword authenticationByPaymentOrVoucher
6) additionalAuthenticationInformation	Table E.5B
The available additional information known about the user on the basis of the authentication process has the following structure.	
phoneNumber	
Description and requirements	
Number for the party in ITU-T E.164 (11/10) format. For instance the number to which an SMS token has been sent.	41754601234
mACAddress	
Description and requirements	

The MAC address of the authorised device.	A12345678D5B
iMSI	
Description and requirements	
The IMSI of the authorised device. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
username	
Description and requirements	
The username used by the party to obtain the authorisation to activate the network access.	FOOBAR
password	
Description and requirements	
The password used by the party to obtain the authorisation to activate the network access.	barfoo
7) accessPointIPAddress	Table E.5B
Description and requirements	*Example*
The IP address or prefix of the Access Point used by the target for the network access. Preferably in text format using the element "iPTextAddress".	2001:db8:230f:c349:1205::4f6
8) cSPDefinedName	Table E.5B
Description and requirements	*Example*
CSP-defined label or name assigned to the access point.	AirportZRH01-CH

octetsDownloaded	Table E.3
Description and requirements	*Example*
Number of octets downloaded by the subscriber during the network access session.	1825025

octetsUploaded	Table E.3
Description and requirements	*Example*
Number of octets uploaded by the subscriber during the network access session.	258472

7.4.3.2.1 Structure for location information for 3GPP access obtained via the NAS messages

This section covers the elements and fields of the Network access service usage records that are specified in ETSI TS 102 657 V2.6.1 Annex E.2.4 when the mobile 3GPP access location information is obtained or derived by the CSP via the lower-layer messages (e.g. S1AP or NGAP) carrying the NAS messages exchanged on the Non-Access Stratum (NAS) interface between the UE and the Core networks.

The following elements derived from the lower-layer and NAS messages and the CSP management system shall be delivered in the response records via the HI-B interface according to the XML schema specified in the section 7.6 of this document:

IMSI or SUPI as target UE identity in the core network: The NAS messages contain either the IMSI or the TMSI. In case of TMSI the CSP shall map the temporary UE identity to the permanent IMSI or SUPI UE identity to populate the response record:

Element	Description
iMSI	The International Mobile Subscriber Identity (IMSI) associated with the 3GPP mobile network access.
sUPI	The 5G System Subscriber Permanent Identifier can take the form of an IMSI or NAI.

Location information source: Depending of the Radio Access Technology (RAT) used by the target, the name of the network node, respectively the network function, from which the location information in the lower-layer and NAS messages shall be indicated in the element locationInformationSource:

Element	Description
locationInformationSource	The locationInformationSource shall contain the string NAS when the location information is derived from the lower-layer and NAS messages. In addition, the CSP can optionally indicate the origin of the message by adding the values “NETWORK” when the NAS message is originated by the core network or “UE” when the message is originated by the user equipment.

Area and cell identity: Depending of the Radio Access Technology (RAT) used by the target, the area and cell identity contained in the NAS messages shall be mapped with the corresponding element in the Location structure:

Element	Description
globalCellID	Area and cell identity for GERAN or UTRAN RAT
userLocationInformation	Area and cell identity for GERAN or UTRAN or E-UTRAN RAT
trackingAreaIdentifier	Area identity for NR or E-UTRAN RAT controlled by 5G Core
nCGI	Cell identity for NR RAT

Geo-coordinates: The geo-coordinates providing the location of the cell serving the user are not part of the NAS messages but shall be populated by the CSP based on the data of its network management system. The geo-coordinates shall be delivered in the elements of the location structure:

Element	Description
gsmLocation	The geographical coordinates of the antenna serving the target UE shall be indicated according to the WGS84 World Geodetic System.

Time of location: The time of the location information in the NAS message shall be indicated in the corresponding element:

Element	Description
Interval startTime	Time stamp corresponding to the UTC time at which the location information has been acquired.

Each timed location information derived from the lower-layer and NAS message collected during the requested interception period, and independently from the NAS procedure involved, shall be delivered as one ResponseRecord with the structure illustrated in the figure 7-1.

Elements structure illustration	Value example
responsePayload	
ResponseRecord	
recordNumber	**0**
recordPayload	
networkAccess	
naServiceUsage	
interval	
startTime	20191109134234.236Z
location	
gsmLocation	
geoCoordinates	
latitude	N463101.31
longitude	E0063744.88
mapDatum	wGS84
azimuth	120
userLocationInformation	1822F89910F722F89901021001
locationInformationSource	NAS
ePSInformation	
iMSI	228993035511773F
ResponseRecord	
recordNumber	**1**
recordPayload	
networkAccess	
naServiceUsage	
interval	
startTime	20191109134308.129Z
location	
gsmLocation	
geoCoordinates	
latitude	N463115.90
longitude	E0063747.39
mapDatum	wGS84
azimuth	180
userLocationInformation	0622F8990B0CC70122F8990B0C02FF
locationInformationSource	NAS NETWORK
ePSInformation	
iMSI	228993035511773F
ResponseRecord	
recordNumber	**2**
recordPayload	
networkAccess	
naServiceUsage	
interval	
startTime	20191109134452.225Z
location	
gsmLocation	
geoCoordinates	
latitude	N463108.72
longitude	E0063803.36
mapDatum	wGS84
azimuth	210
nCGI	
pLMNID	22F899
nRCellID	AB12CD34E0
trackingArealdentifier	22F899AB56E3
locationInformationSource	NAS UE
fiveGSInformation	
sUPI	
iMSI	228993035511773F

Figure 7-1: Elements structure for the location information records derived from the NAS messages

7.4.4 HD_31_PAGING & EP_35_PAGING Proprietary handover interface for the delivery of the last active location

The provisions of articles 63 and 67 letter a in the ordinance VÜPF do not have any suitable standardised ETSI handover interfaces for the delivery of the last active location. Therefore, PTSS has temporarily specified a proprietary interface with the following methods and steps:

Step	Description	Handover interface
1	PTSS sends the corresponding instruction with the requested elements specified in section 7.4.5.1 electronically via the administrative interface.	HI-A according to ETSI TS 102 657 V2.6.1 or Secure Email
2	Conditional: (see NOTE 1) PTSS contacts the CSP by telephone and provides the known information of the instruction and target.	Telephone
3	Conditional: (see NOTE 1) CSP performs the lookup in its information systems in order to retrieve the requested information and provide this information to the PTSS by telephone.	Telephone
4	CSP confirms to the PTSS by secure email the set of information and parameters in a table put in the body of the secure email. The information and parameters of the table are specified in the layout in section 7.4.4.2. The secure email subject field shall be composed of the request number and the request type taken from the instruction and the suffix “Response”, such as: `HD_20200505715852 – EP_35_PAGING – Response`	Secure email (see NOTE 2)
NOTE 1: The steps 1 and 2 using telephone are conditional and only necessary when the HD_31_PAGING and EP_35_PAGING interception processes require manual steps. PTSS specifies based on consultations with the CSP if the steps 2 and 3 shall be implemented. NOTE 2: The secure email address for the delivery of the response is provided by PTSS to the CSP after having consulted them.		

Table 7-7: Steps for the delivery of the last active location

7.4.4.1 Paging request elements

Target identity for multimedia		
Element or attribute	**Description**	**Example**
equals	Request constraint	
multimediaRecord	Service = multimedia	
multimediaServiceUsage	Category = multimedia service usage	
partyInformation	XSD structure	
multimediaPartyInformation	XSD structure	

partyIdentity	SIP URI or TEL URI or E.164 number in international format. This element is also suitable for providing the SUPI in NAI format or the GPSI for 5G networks.	sip:alice@atlanta.com tel:+41598889988 41598889988
iMSI	The International Mobile Subscriber Identity (IMSI) of the target. This element is also suitable for providing the SUPI in IMSI format for 5G networks. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
iMEI	The International Mobile Station Equipment Identity (IMEI or IMEISV) of the target. IMEI is encoded on 8 octets to allow the 14 digits (TAC+SNR) + 1 digit of the Check Digit or the 2 digits of the Software Version (SVN). The unused final digit shall be set to "F". When no SV is present or when SV is not relevant, the IMEI shall be coded with the first 14 digits + 0F at the end. See 3GPP TS 29.060 V18.0.0 clause 7.7.53. This element is also suitable for providing the PEI in IMEI or IMEISV format for 5G networks.	3568431553965710 359040082042280F

7.4.4.2 Paging response elements to be delivered for the last active location

This section covers the information response elements and fields for the Paging response. There are two methods to deliver this information.

Method 1: The ad hoc report with the parameters described in the table below delivered via secure email.

Parameters names	Comments	Examples
Zielidentität / Identité de la cible		
MSISDN	Mandatory	4177XXXXXXX
GPSI	Conditional	4177UUUUUUU
IMSI	Conditional	22899YYYYYYYYY
SUPI (IMSI)	Conditional	22899VVVVVVVVV
SUPI (NAI)	Conditional	user@domain.example
IMEI	Conditional	354449ZZZZZZZZ
PEI (IMEI)	Conditional	354449WWWWWWWW
PEI (EUI-64)	Conditional	0211:22FF:FE33:4455 (NOTE)
PEI (MAC)	Conditional	00:11:22:33:44:55 (NOTE)
Netzzugang / Accès réseau		

RADIO ACCESS TECHNOLOGY / FREQUENCY	Technology (GSM or UMTS or LTE or NR) and Frequency band in MHz of the primary node.	UMTS900 LTE1800 NR3500 WLAN
MOBILE COUNTRY CODE	Decimal presentation	228
MOBILE NETWORK CODE	Decimal presentation	99
IP ADDRESS	Used only when available in case of WLAN access	198.51.100.24 2001:DB8::122
PORT NUMBER	Used only when available in case of WLAN access	48256
Letzter Zellstandort / Dernière localisation de cellule		
DATE TIME	Date and Local time as DD.MM.YYYY HH:MM:SS	11.09.2016 15:39:05
LAC (DECIMAL)	Conditional: GERAN & UTRAN / format: without MCC/MNC and no leading zeros	22300
CI (DECIMAL)	Conditional: GERAN & UTRAN / format: without MCC/MNC and no leading zeros	60773
TAC (DECIMAL)	Conditional: E-UTRAN & NR format: without MCC/MNC and no leading zeros	4343 1111889
ENB+CI (DECIMAL)	Conditional: E-UTRAN /format: without MCC/MNC and no leading zeros	17787394
GNB+CI (DECIMAL)	Conditional: NR / format: without MCC/MNC and no leading zeros	4553573042
CELL AZIMUTH	Conditional: Multiple azimuths and attributes (tun, inh) if necessary for complex cells	inh, 60
CELL CIVIC ADDRESS	Civic address in one field	Rue du Caudray 6 1020 Renens
CELL N COORDINATES (CH1903+)	CH1903+ Geodetic system N coordinates (north)	1214749
CELL E COORDINATES (CH1903+)	CH1903+ Geodetic system E coordinates (east)	2601349
Last WLAN Hotspot location		
BSSID	Optional: The Basic Service Set Identification of the WLAN hotspot. Equivalent to the MAC address of the hotspot.	001B44113AB7 *[in hexadecimal format]*
CSPDEFINEDNAME	CSP-defined label or name assigned to the access point. The hotspot of a CSP within a venue or geographical location typically shares this name.	AirportZRH01-CH

HOTSPOT CIVIC ADDRESS	Hotspot civic address in one field	Terminal 1 Zurich Airport 8058 Zürich
HOTPOT N COORDINATES (CH1903+)	CH1903+ Geodetic system N coordinates (north)	1256398
HOTSPOT E COORDINATES (CH1903+)	CH1903+ Geodetic system E coordinates (east)	2684705

Table 7-8: Method 1 - parameters to be delivered for the last active location

NOTE: MAC and EUI-64 addresses shall be represented in Colon Hexadecimal Notation.

Method 2: The last active location can be delivered via the HI-B interface according to ETSI TS 102 657 V2.6.1 Annexes A and E. Prior to its implementation, this method 2 must be determined by the PTSS based on consultations with the CSP.

Structure of response of the reference network access session (Mobile or WLAN)		
Element or attribute	**Description**	**Example**
networkAccess	Service = network access	
naServiceUsage	Category = network access service usage	
Structure to provide the last network access time and IP address		
naAccessTime	GeneralizedTime	20191109134308.129Z
NAAssignedAddress	SEQUENCE	
addressSetOrRangeOrMask	SEQUENCE	
IPaddressSetOrRangeOrMask	CHOICE	
set	SEQUENCE OF	
IPAddress	CHOICE	
iPTextAddress		198.51.100.25 2001:DB8:7401::bdd7
portNumber		42549
Structure to provide the last location information and the transmitter details		
location	SEQUENCE	
globalCellID	Cell Global Identity (CGI) serving the party of the reference call. The CGI may be used for GERAN and UTRAN mobile PS network access. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets)	22F8901D50BB59 *[in hexadecimal format]*
gsmLocation	CHOICE	
geoCoordinates	SEQUENCE	
latitude	Geographic coordinates that specifies the north–south position of a point on the Earth's surface according to the World Geodetic System 1984.	N465648.10
longitude	Geographic coordinates that specifies the east-west position of a point on the	E0072650.80

	Earth's surface according to the World Geodetic System 1984.	
mapDatum	World Geodetic System indication of the coordinates	wGS84
azimuth	The azimuth is the bearing, relative to true north	270
sAI	Serving Area Identifier according to 3GPP TS 23.003 V18.7.0 MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+SAC(2 octets)	22F89065425785 *[in hexadecimal format]*
postalLocation	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	28
streetName	Street name	Marktplatz
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
extendedLocation	CHOICE	NOTE 1
region	SEQUENCE	
cornerMarks	SEQUENCE OF	
Spot	CHOICE	
gsmLocation	CHOICE	
geoCoordinates	SEQUENCE	
latitude	Geographic coordinates that specifies the north–south position of a point on the Earth's surface according to the World Geodetic System 1984.	N465632.40
longitude	Geographic coordinates that specifies the east-west position of a point on the Earth's surface according to the World Geodetic System 1984.	E0072622.14
mapDatum	World Geodetic System indication of the coordinates	wGS84
azimuth	The azimuth is the bearing, relative to true north	120
Spot	CHOICE	
postalLocation	CHOICE	
AddressInformation	SEQUENCE	
buildingNumber	Building number	42
streetName	Street name	Hauptstrasse
postalCode	Postal code of the city	9998
city	City	Ueberdorf
country	Country code as defined in ISO 3166-1 (2013)	CH

NOTE 1: The use of the “extendedLocation” structure is dedicated to the delivery of the mobile 3GPP access location information to a cell composed of several antennas distributed in different geographical locations but sharing the same cell identity.		
tAI	Tracking Area Identifier used for E-UTRAN according to 3GPP TS 23.003 V18.7.0. First octet "05" represents the length in octets. MCC(2 octets)+MNC(1 octet)+TAC(2 octets)	0522F89035B7 *[in hexadecimal format]*
eCGI	E-UTRAN Cell Global Identifier used for E-UTRAN according to 3GPP TS 23.003 V18.7.0. First octet "07" represents the length in octets. MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0)	0722F890056C8720 *[in hexadecimal format]*
nCGI	The NR Cell Global Identity (NCGI) is composed of the PLMN Identifier (pLMNID) and the NR Cell Identity (nRcellID) as shown in 3GPP TS 23.003 V18.7.0 clause 19.6A	
pLMNID	Public Land Mobile Network Identifier MCC(2 octets)+MNC(1 octet)	22F899
nRcellID	NR Cell Identity (encoded with 36 bits, 5 octets with most significant semi-octet as spare = 0)	0AB12CD34E
trackingAreaIdentifier	The "Tracking Area Identity" is coded in accordance with 3GPP TS 29.274 V18.8.0 cl. 8.21.4 and the 5G TAI see 3GPP TS 23.003 V18.7.0 clause 28.6. This element shall be used only in the context of 5G NR or Multi-RAT connectivity. MCC(2 octets)+MNC(1 octet)+TAC(2 octets for E-UTRAN or 3 octets for NR)	22F899AB56E3 22F89948CF
locationInformationSource	To provide specific information about the configuration characteristics of a complex cell. For instance with several azimuths and split sectors	170,0,180,Normal, SplitSec,SplitSec
n3gppaLocation		

n3gppTai	non-3GPP TAI used in the PLMN. MCC(2 octets)+MNC(1 octet)+TAC(3 octets)	22F899AC7D76
..n3IwfId	N3IWF identifier received over NGAP MCC(2 octets)+MNC(1 octet)+N3IWF-ID(2 octets).	22F899ABC2
ueIpv4Addr		
iPTextAddress		198.51.100.1
ueIpv6Addr		
iPTextAddress		2001:DB8:7401::bdd7
portNumber	UDP or TCP source port number	49345
transmitterDetails	SEQUENCE	
frequency	Transmitter frequency in kHz	1800000
technology	Technology used for the network access	gen2G gen3G eUTRAN wLAN hSPAEvolution gAN vIRTUAL eUTRANNBIoT lTEM nR
Structure to provide the identifiers information and the radio access type for the different network access technologies		
ePSInformation	The identifiers are related to a mobile network access based on GERAN, UTRAN or E-UTRAN.	
iMSI	The International Mobile Subscriber Identity (IMSI) of the target. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
mSISDN	MSISDN number of the mobile target.	
PartyNumber		41751112233
iMEISV	The International Mobile Station Equipment Identity (IMEI) of the target.	
IMEI		356843155396570F
rATType	This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station as defined in 3GPP TS 29.060 V18.0.0 clause 7.7.50, if available.	1 (=UTRAN) 2 (=GERAN) 3 (=WLAN) 4 (=GAN) 5 (=HSPA Evolution) 6 (=E-UTRAN)
fiveGSInformation	The identifiers are related to a mobile network access based on NR 5G system	

sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
pEI	Served PEI of the ME as specified in 3GPP TS 23.003 V18.7.0 Clause 6.4, if available.	
IMEI	IMEI is encoded on 8 octets to allow the 14 digits (TAC+SNR). When no Check Digit is present the IMEI shall be coded with the first 14 digits + 0F at the end. See 3GPP TS 29.060 V18.0.0 clause 7.7.53.	359040082042280F
IMEISV	IMEISV is encoded on 8 octets to allow the 14 digits (TAC+SNR) + 2 digits of Software Version (SV). See 3GPP TS 29.060 V18.0.0 clause 7.7.53.	3571600455770051
mACAddress	The MAC address of the device is encoded as a string. See 3GPP TS 23.003 V18.7.0 clause 6.4.	A12345678D5B
eUI64	The 64-Bit Extended Unique Identifier (EUI-64) of the device is encoded as a string. See 3GPP TS 23.003 V18.7.0 clause 6.4.	A32345FFFE678D5B
rAT5Type	This field indicates the primary Radio Access Technology (RAT) type of PDU session used by the Mobile Station as defined in 3GPP TS 29.571 V18.10.0 clause 5.4.3.2, such as New Radio, Evolved Universal Terrestrial Radio Access, Wireless LAN, Virtual (Virtual	nr eutra wlan, virtual nBIoT wireline wirelineCable wirelineDSL wirelinePON ITEM

	shall be used if the N3IWF does not know the access technology used for an untrusted non-3GPP access), when available. Formatted as per 3GPP TS 32.291 V18.10.0 clause 6.1.6.1.	nRU eUTRAU trustedN3GA trustedWLAN uTRA gERA nRLEO nRMEO nRGEO nROTHERSAT nRREDCAP
rANSecondaryRATType	Secondary Radio Access Type (RAT) usage as reported from the Radio Access Network (RAN) if available. See 3GPP TS 32.291 V18.10.0 clause 6.1.6.2.2.17	nr eutra
wifiInformation		
bSSID	The Basic Service Set Identification (BSSID) is the MAC address of the access point.	001B774954FD *[in hexadecimal format]*
LocationOfAccessPoint		
gsmLocation		
geoCoordinates	SEQUENCE	
latitude	Geographic coordinate that specifies the north–south position of a point on the Earth's surface according to the World Geodetic System 1984.	N472711.10
longitude	Geographic coordinate that specifies the east-west position of a point on the Earth's surface according to the World Geodetic System 1984.	E0083343.20
mapDatum	World Geodetic System indication of the coordinates	wGS84
postalLocation	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	1
streetName	Street name	Terminal Zurich Airport
postalCode	Postal code of the city	8058
city	City	Zurich
country	Country code as defined in ISO 3166-1 (2013)	CH
cSPDefinedName	CSP-defined label or name assigned to the hotspot.	AirportZRH01-CH

Table 7-9: Method 2 - parameters to be delivered via HI-B for the last active location

7.4.5 AS_32_PREP_COV Network analysis in preparation of a search by cell coverage area

7.4.5.1 Network analysis preparation request elements

This section covers the request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for network analysis for the preparation of a search by cell coverage area. This is one of the possibilities to determine which cells shall be searched in AS_34 / AS_34_MORE.

Element or attribute	Description	Example
equals	Request constraint	
networkAccess	Service = network access	
naServiceUsage	Category = network access service usage	

Location	Table E.3
General requirements	
The location information structure may be composed of: 1) Geographical coordinates, 2) Postal location The following location information elements and fields may be present in the request:	
1) Geographical coordinates elements	
gsmLocation	Table B.11
Description and requirements	*Examples*
The formats of the following elements (latitude and longitude) are defined in detail in ETSI TS 102 657 V2.6.1 Annex B.3. The geographical coordinates of the antenna shall be indicated according to the WGS84 World Geodetic System. Elements: latitude [XDDMMSS.SS] longitude [XDDDMMSS.SS] mapDatum	 N465648.10 E0072650.80 wGS84
2) Postal location elements	
buildingNumber	
Description and requirements	*Examples*
The building number.	127 4a
streetName	
Description and requirements	*Examples*
The name of the street or place or road indication.	route de Versoix Bärenplatz Autobahn A5 km38 Langstrasse 15 Note: UTF-8 coding is preferred.
postalCode	
Description and requirements	*Examples*

Postal code of the location.	3011
city	
Description and requirements	*Examples*
The name of the city, village or area (as applicable).	Bern Zürich Lugano Note: UTF-8 coding is preferred.
country	
Description and requirements	*Examples*
Country code as defined in ISO 3166-1 (2013)	CH FL
otherInformation	
Description and requirements	*Examples*
Additional information of the venue	Indoor EG Terminal B Any type of geographical coordinates

7.4.5.2 Network analysis preparation response elements

This section covers the elements and fields for the response for network analysis for the preparation of a search by cell coverage area.

Element or attribute	Description	Example
recordPayload		
networkAccess	Service = network access	
naServiceUsage	Category = network access service usage	

Location	Table E.3
General requirements	
The Location structure is used for mobile networks. The following cell identities can be provided, depending on the radio access technology: GERAN radio access technology: a) Cell and area identity elements: globalCellID UTRAN radio access technology: b) Cell and area identity elements: globalCellID E-UTRAN radio access technology: c) Cell and area identity elements: userLocationInformation or eCGI NR radio access technology: d) Cell and area identity elements: nCGI, trackingAreaIdentifier	
1) Cell and area identity elements	
globalCellID	Table B.11

Description and requirements	*Example*
Cell Global Identity (CGI). The CGI may be used for GERAN and UTRAN. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets)	22F8901D50BB59 *[in hexadecimal format]*
userLocationInformation	Table B.11
Description and requirements	*Example*
This field is to be used only for E-UTRAN network access and is composed of the Tracking Area Identifier (TAI) and the E-UTRAN Cell Global Identification (ECGI) components. First octet represents the flags as specified in 3GPP TS 29.274 V18.8.0 clause 8.21. MCC(2 octets)+MNC(1 octet)+TAI(2 octets)+MCC(2octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0)	1822F899123422F89907654321 *[in hexadecimal format]*
eCGI	Table B.11
Description and requirements	*Example*
E-UTRAN Cell Global Identity (ECGI) First octet "07" represents the length in octets. MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0)	0722F890056C8720 *[in hexadecimal format]*
trackingAreaIdentifier	Table B.11
Description and requirements	*Example*
The "Tracking Area Identity" is coded in accordance with 3GPP TS 29.274 V18.8.0 cl. 8.21.4 and the 5G TAI see 3GPP TS 23.003 V18.7.0 clause 28.6. This element shall be used only in the context of 5G NR and Multi-RAT connectivity. MCC(2 octets)+MNC(1 octet)+TAC(2 octets for E-UTRAN or 3 octets for NR)	22F899AB56E3 22F89948CF
nCGI	Table B.11
Description and requirements	*Example*
The NR Cell Global Identity (NCGI) is composed of the concatenation of the PLMN Identifier (pLMNID) and the NR Cell Identity (nRcellID) as shown in 3GPP TS 23.003 V18.7.0 clause 19.6A	
pLMNID [MCC(2 octets)+MNC(1 octet)]	22F899
nRcellID [encoded with 36 bits, 5 octets with most significant semi-octet as spare = 0]	0AB12CD34E

wiFiInformation	Table E.3
General requirements	
Information specific to wireless lan (wlan) network access. The structure is composed of the following element:	
bSSID	Table E.5B
Description and requirements	*Example*
The Basic Service Set Identification (BSSID) is the MAC address of the access point.	001B774954FD *[in hexadecimal format]*
locationOfAccessPoint	Table E.5B
Location	Structure

postalLocation	
AddressInformation	
Description and requirements	
Allow the CSP to provide a postal address of the access point, if necessary and available.	
buildingNumber	
Description and requirements	*Examples*
The building number.	127 4a
streetName	
Description and requirements	*Examples*
The name of the street or place or road indication.	route de Versoix Bärenplatz Autobahn A5 km38 Langstrasse 15 Note: UTF-8 coding is preferred.
postalCode	
Description and requirements	*Examples*
Postal code of the location.	3011
city	
Description and requirements	*Examples*
The name of the city, village or area (as applicable).	Bern Zürich Lugano Note: UTF-8 coding is preferred.
country	
Description and requirements	*Examples*
Country code as defined in ISO 3166-1 (2013)	CH FL
otherInformation	
Description and requirements	*Examples*
Additional information of the venue	Indoor EG Terminal B
cSPDefinedName	Table E.5B
Description and requirements	*Examples*
CSP-defined label or name assigned to the access point.	AirportZRH01-CH

7.4.6 AS_33_PREP_REF Determination of reference calls or sessions in preparation of a search by cell coverage area

7.4.6.1 Reference calls or sessions preparation request elements

This section covers the request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for reference calls or sessions for the preparation of a search by cell coverage area. This is one of the possibilities to determine which cells shall be searched in AS_34 / AS_34_MORE.

There are two types of requests:

1) For reference telephony calls the Multimedia service usage category shall be used, even for circuit-switched based telephony service.

1) Structure of request of the reference call (Multimedia)		
Element or attribute	**Description**	**Example**
isAMemberOf	Request constraint	
multimediaRecord	Service = multimedia	
multimediaServiceUsage	Category = multimedia service usage	
partyInformation	XSD structure	
multimediaPartyInformation	XSD structure	
partyRole	Role of the parties performing the reference call.	calling called
partyIdentity	SIP URI or TEL URI or E.164 number in international format.	sip:alice@atlanta.com tel:+41598889988 41598889988
Time interval constraints for the request		
lessThanOrEqualTo	Request constraint	
multimediaRecord	Service = multimedia	
multimediaServiceUsage	Category = multimedia service usage	
partyInformation	XSD structure	
MultimediaPartyInformation	XSD structure	
communicationTime		
startTime	The calendar date and time of the beginning of the communication with at least a precision to the second. It shall be in local time with indication of the time zone relative to UTC or in UTC time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (02/21).	20190428110000Z
greaterThanOrEqualTo	Request constraint	
multimediaRecord	Service = multimedia	
multimediaServiceUsage	Category = multimedia service usage	
partyInformation	XSD structure	

MultimediaPartyInformation	XSD structure	
communicationTime		
startTime	The calendar date and time of the beginning of the communication with at least a precision to the second. It shall be in local time with indication of the time zone relative to UTC or in UTC time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (02/21).	20190428100000Z

2) For reference mobile-based and wlan-based network access sessions the network access service usage category shall be used.

2) Structure of request of the reference network access session (Mobile or WLAN)		
Element or attribute	**Description**	**Example**
isAMemberOf	Request constraint	
networkAccess	Service = network access	
naServiceUsage	Category = network access service usage	
nwAccessType	Type of network access performed as reference session.	wirelessLAN mobilePacketData
Structure to provide the identity for reference mobile network access		
ePSInformation	Structure to provide the identity related to the reference mobile network access, either GPRS or EPS. The EPS structure shall be used.	Table E.5A
iMSI	The International Mobile Subscriber Identity (IMSI) of the target. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
mSISDN	MSISDN number of the mobile target.	
PartyNumber		41751112233
fiveGSInformation	The target identity is related to a mobile network access based on 5G system	
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI.	228993035511773F

	(IMSI is 15 digits long + last digit "F" as a filler half-octet)	
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
Structure to provide the identity for reference WLAN network access		
wifiInformation	Structure to provide the identity related to the reference WLAN network access	Table E.5B
sSID	The human-readable Service Set Identifier.	Free-WLAN
username	Username as provided in the reference session.	john.doe
Time interval constraints for the request		
lessThanOrEqualTo	Request constraint	
networkAccess	Service = network access	
naServiceUsage	Category = network access service usage	
interval	XSD structure	
startTime	The calendar date and time of the beginning of the communication with at least a precision to the second. It shall be in local time with indication of the time zone relative to UTC or in UTC time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (02/21).	20181028090000Z
greaterThanOrEqualTo	Request constraint	
networkAccess	Service = network access	
naServiceUsage	Category = network access service usage	
interval	XSD structure	

startTime	The calendar date and time of the beginning of the communication with at least a precision to the second. It shall be in local time with indication of the time zone relative to UTC or in UTC time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (02/21).	20181028080000Z

7.4.6.2 Reference calls or sessions preparation response elements

This section covers the elements and fields for the response for reference calls or sessions for the preparation of a search by cell coverage area.

There are two types of responses:
1) For reference telephony calls the Multimedia service usage category shall be used, even for circuit-switched based telephony service.

1) Structure of the response for reference call (Multimedia)		
Element or attribute	**Description**	**Example**
multimediaRecord	Service = multimedia	
multimediaServiceUsage	Category = multimedia service usage	
partyInformation	XSD structure	
multimediaPartyInformation	XSD structure	
partyRole	Role of the parties performing the reference call.	calling called
partyIdentity	SIP URI or TEL URI or E.164 number in international format.	sip:alice@atlanta.com tel:+41598889988 41598889988
natureOfAddress	Optionally the nature of address element may complement the “partyIdentity” element in order to avoid any ambiguity.	International National Unknown
accessNetworkInformation	Structure with a sequence of accessNetworkInfo, composed of the PaniHeaderInfo structure.	
AccessNetworkInfo	SEQUENCE OF	
paniHeaderInfo		
paniLocation		
globalCellID	Cell Global Identity (CGI) serving the party of the reference call. The CGI may be used for GERAN and UTRAN mobile PS network access.	22F8901D50BB59 *[in hexadecimal format]*

	MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets)	
eCGI	E-UTRAN Cell Global Identity (ECGI) serving the party of the reference call in E-UTRAN mode (VoLTE). Firs octet "07" represents the length in octets. MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0)	0722F890056C8720 *[in hexadecimal format]*
nCGI	The NR Cell Global Identity (NCGI) is composed of the concatenation of the PLMN Identifier (pLMNID) and the NR Cell Identity (nRcellID) as shown in 3GPP TS 23.003 V18.7.0 clause 19.6A	
pLMNID	MCC(2 octets)+MNC(1 octet)	22F899
nRcellID	Encoded with 36 bits, 5 octets with most significant semi-octet as spare = 0	0AB12CD34E

2) For reference mobile-based and wlan-based network access sessions the network access service usage category shall be used.

2) Structure of response of the reference network access session (Mobile or WLAN)		
Element or attribute	**Description**	**Example**
networkAccess	Service = network access	
naServiceUsage	Category = network access service usage	
Structure to provide the cell identity for reference mobile network access		
location	Structure used to provide the cell identity information at the beginning of the reference mobile network access session.	
globalCellID	Cell Global Identity (CGI) serving the party of the reference session. The CGI may be used for GERAN and UTRAN mobile PS network access. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets)	22F8901D50BB59 *[in hexadecimal format]*
userLocation-Information	This field is used for E-UTRAN network access and is composed of the Tracking	1822F899123422F89907654321 *[in hexadecimal format*

	Area Identifier (TAI) and the E-UTRAN Cell Global Identification (ECGI) components. First octet represents the flags as specified in 3GPP TS 29.274 V18.8.0 clause 8.21. MCC(2 octets)+MNC(1 octet)+TAI(2 octets)+MCC(2octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0) Alternatively, this element can also be used for providing the area and cell identity for GERAN or UTRAN network access. In this case there is no need to provide the globalCellID or sAI fields in the Location structure.	
eCGI	E-UTRAN Cell Global Identity (ECGI) serving the party of the reference call in E-UTRAN mode (VoLTE). First octet "07" represents the length in octets. MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0)	0722F890056C8720 *[in hexadecimal format]*
nCGI	The NR Cell Global Identity (NCGI), composed of the concatenation of the PLMN Identifier (PLMN-Id) and the NR Cell Identity (NCI) as shown in 3GPP TS 23.003 V18.7.0 clause 19.6A.	
pLMNID	MCC(2 octets)+MNC(1 octet)	22F899
nRcellID	Encoded with 36 bits, 5 octets with most significant semi-octet as spare = 0	0AB12CD34E
additionalLocations	Structure used to provide the cell identity information during and at the end of the reference mobile network access session, if available.	
TimedLocation	SEQUENCE	
Location		
globalCellID	Cell Global Identity (CGI) serving the party. The CGI may be used for GERAN and	22F8901D50BB59 *[in hexadecimal format]*

	UTRAN mobile PS network access. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets)	
userLocation-Information	This field is used for E-UTRAN network access and is composed of the Tracking Area Identifier (TAI) and the E-UTRAN Cell Global Identification (ECGI) components. First octet represents the flags as specified in 3GPP TS 29.274 V18.8.0 clause 8.21. MCC(2 octets)+MNC(1 octet)+TAI(2 octets)+MCC(2octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0) Alternatively, this element can also be used for providing the area and cell identity for GERAN or UTRAN network access. In this case there is no need to provide the globalCellID or sAI fields in the Location structure.	1822F899123422F89907654321 *[in hexadecimal format*
eCGI	E-UTRAN Cell Global Identity (ECGI) serving the party in E-UTRAN mode (VoLTE). First octet "07" represents the length in octets. MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0)	0722F890056C8720 *[in hexadecimal format]*
nCGI	The NR Cell Global Identity (NCGI), composed of the concatenation of the PLMN Identifier (PLMN-Id) and the NR Cell Identity (NCI) as shown in 3GPP TS 23.003 V18.7.0 clause 19.6A.	
pLMNID	MCC(2 octets)+MNC(1 octet)	22F899
nRcellID	Encoded with 36 bits, 5 octets with most significant semi-octet as spare = 0	0AB12CD34E
naAccessTime	GeneralizedTime	20191109134308.129Z
Structure to provide the identity for reference mobile network access		
ePSInformation	Structure to provide the identity related to the	Table E.5A

	reference mobile network access, either GPRS or EPS. The EPS structure shall be used.	
iMSI	The International Mobile Subscriber Identity (IMSI) of the target. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
mSISDN	MSISDN number of the mobile target.	
PartyNumber		41751112233
fiveGSInformation	The target identity is related to a mobile network access based on 5G system	
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
Structure to provide the access point identity for reference WLAN network access		
wifiInformation	Structure to provide the access point identity related to the reference WLAN network access	
bSSID	The Basic Service Set Identification (BSSID) for the network access connection. This is also the MAC address of the access point.	9AF3BB829824
sSID	The Service Set Identifier if available	WLAN-Public
username	Username as provided in the reference session.	john.doe
locationOfAccessPoint		
Location	Structure	
AddressInformation		
postalLocation	Optionally allows the CSP to provide a postal address of the access point, if necessary and available.	
buildingNumber	The building number.	127 4a

streetName	The name of the street or place or road indication.	route de Versoix Bärenplatz Autobahn A5 km38 Langstrasse 15 Note: UTF-8 coding is preferred.
postalCode	Postal code of the location.	3011
city	The name of the city, village or area (as applicable).	Bern Zürich Lugano Note: UTF-8 coding is preferred.
country	Country code as defined in ISO 3166-1 (2013)	CH FL
otherInformation	Additional information of the venue	Indoor EG Terminal B

7.4.7 AS_34 & AS_34_MORE Search by cell coverage area by mobile telephony and network access

7.4.7.1 Search by cell coverage area request elements

This section covers the request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the search by cell coverage area.

There are two types of requests:
1) For mobile telephony calls on a cell the Multimedia service usage category shall be used, even for circuit-switched based telephony service.

1) Structure of request for mobile telephony calls on a cell (Multimedia)		
Element or attribute	**Description**	**Example**
equals	Request constraint	
multimediaRecord	Service = multimedia	
multimediaServiceUsage	Category = multimedia service usage	
partyInformation	XSD structure	
accessNetworkInformation	Structure with a sequence of accessNetworkInfo, composed of the PaniHeaderInfo structure.	
AccessNetworkInfo	XSD structure	
paniHeaderInfo		
paniLocation		
globalCellID	Cell Global Identity (CGI) serving the party. The CGI may be used for GERAN and UTRAN mobile PS network access. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets)	22F8901D50BB59 *[in hexadecimal format]*

tAI	Tracking Area Identity (TAI) serving the target in E-UTRAN mode as specified in 3GPP TS 23.272 V18.0.0. First octet "05" represents the length in octets. MCC(2 octets)+MNC(1 octet)+TAC(2 octets)	0522F89035B7 *[in hexadecimal format]*
eCGI	E-UTRAN Cell Global Identity (ECGI) serving the party in E-UTRAN mode (VoLTE). Firs octet "07" represents the length in octets. MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0)	0722F890056C8720 *[in hexadecimal format]*
trackingAreaIdentifier	The "Tracking Area Identity" is coded in accordance with 3GPP TS 29.274 V18.8.0 cl. 8.21.4 and the 5G TAI see 3GPP TS 23.003 V18.7.0 clause 28.6. This element shall be used only in the context of 5G NR and Multi-RAT connectivity. MCC(2 octets)+MNC(1 octet)+TAC(2 octets for E-UTRAN or 3 octets for NR)	22F899AB56E3 22F89948CF
nCGI	The NR Cell Global Identity (NCGI) is composed of the concatenation of the PLMN Identifier (pLMNID) and the NR Cell Identity (nRcellID) as shown in 3GPP TS 23.003 V18.7.0 clause 19.6A	
pLMNID	MCC(2 octets)+MNC(1 octet)	22F899
nRcellID	encoded with 36 bits, 5 octets with most significant semi-octet as spare = 0	0AB12CD34E
postalLocation	In case of WLAN access for a multimedia session, allows the CSP to provide a postal address of the access point, if necessary and available.	
AddressInformation		
buildingNumber	The building number.	127 4a
streetName	The name of the street or place or road indication.	route de Versoix Bärenplatz Autobahn A5 km38 Langstrasse 15 Note: UTF-8 coding is preferred.

postalCode	Postal code of the location.	3011
city	The name of the city, village or area (as applicable).	Bern Zürich Lugano Note: UTF-8 coding is preferred.
country	Country code as defined in ISO 3166-1 (2013)	CH FL
otherInformation	Additional information	Indoor EG Terminal B
bSSID	The Basic Service Set Identification of the WLAN Access Point. Equivalent to the MAC address of the Access Point.	001B44113AB7 *[in hexadecimal format]*

Time period interval for the request (Multimedia)		
Element or attribute	**Description**	**Example**
lessThanOrEqualTo and greaterThanOrEqualTo	Request constraints defining the time period interval for the historical data.	
multimediaRecord	Service = multimedia	
multimediaServiceUsage	Category = multimedia service usage	
partyInformation	XSD structure	
multimediaPartyInformation	XSD structure	
communicationTime	XSD structure	
startTime	All communications with startTime in the given period interval in “GeneralizedTime” format.	20180210200001+0100 20180210213000+0100

2) For mobile-based and wlan-based network access sessions the network access service usage category shall be used.

2) Structure of request for mobile or WLAN network access on a cell		
Element or attribute	**Description**	**Example**
networkAccess	Service = network access	
naServiceUsage	Category = network access service usage	
Structure to provide the cell identity for reference mobile network access		
location	Structure used to provide the cell identity information for the search by cell coverage area.	

globalCellID	Cell Global Identity (CGI) serving the party. The CGI may be used for GERAN and UTRAN mobile PS network access. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets)	22F8901D50BB59 *[in hexadecimal format]*
eCGI	E-UTRAN Cell Global Identity (ECGI) serving the party in E-UTRAN mode (VoLTE). First octet "07" represents the length in octets. MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0)	0722F890056C8720 *[in hexadecimal format]*
trackingAreaIdentifier	The "Tracking Area Identity" is coded in accordance with 3GPP TS 29.274 V18.8.0 cl. 8.21.4 and the 5G TAI see 3GPP TS 23.003 V18.7.0 clause 28.6. This element shall be used only in the context of 5G NR and Multi-RAT connectivity. MCC(2 octets)+MNC(1 octet)+TAC(2 octets for E-UTRAN or 3 octets for NR)	22F899AB56E3 22F89948CF
nCGI	The NR Cell Global Identity (NCGI), composed of the concatenation of the PLMN Identifier (PLMN-Id) and the NR Cell Identity (NCI) as shown in 3GPP TS 23.003 V18.7.0 clause 19.6A.	
pLMNID	MCC(2 octets)+MNC(1 octet)	22F899
nRcellID	Encoded with 36 bits, 5 octets with most significant semi-octet as spare = 0	0AB12CD34E
Structure to provide the access point identity for the WLAN network access		
wifiInformation	Structure to provide the identity of the WLAN network access	
bSSID	The Basic Service Set Identification (BSSID) for the network access connection. This is also the MAC address of the access point.	9AF3BB829824
locationOfAccessPoint		
Location	Structure	
postalLocation	Allows the CSP to provide a postal address of the access point, if necessary and available.	
AddressInformation		
buildingNumber	The building number.	127 4a

streetName	The name of the street or place or road indication.	route de Versoix Bärenplatz Autobahn A5 km38 Langstrasse 15 Note: UTF-8 coding is preferred.
postalCode	Postal code of the location.	3011
city	The name of the city, village or area (as applicable).	Bern Zürich Lugano Note: UTF-8 coding is preferred.
country	Country code as defined in ISO 3166-1 (2013)	CH FL
otherInformation	Additional information of the venue	Indoor EG Terminal B
cSPDefinedName	CSP-defined label or name assigned to the access point.	AirportZRH01-CH

Time period interval for the request (Mobile or WLAN network access)		
Element or attribute	**Description**	**Example**
lessThanOrEqualTo and greaterThanOrEqualTo	Request constraints defining the time period interval for the historical data.	
networkAccess	Service = network access	
naServiceUsage	Category = network access service usage	
interval	XSD structure	
startTime	All communications with startTime in the given period interval in “GeneralizedTime” format.	20180210200001+0100 20180210213000+0100

7.4.7.2 Search by cell coverage area response elements

This section covers the elements and fields for the response for a search by cell coverage area.

There are two types of responses:

1) For telephony calls the Multimedia service usage category shall be used, even for circuit-switched based telephony service.

The response structure for telephony and multimedia calls is identical to the section 7.4.2.2

2) For mobile-based and wlan-based network access sessions the network access service usage category shall be used.

The response structure for mobile-based and wlan-based network access sessions is identical to the section 7.4.3.2

7.4.8 EP_38_HD Combined network access and multimedia service usage for emergency paging

7.4.8.1 Combined network access and multimedia service usage request criteria elements and structure

This section covers the request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the EP_38_HD combined network access and multimedia service usage for emergency paging.

There are two types of requests:

1) For multimedia and telephony sessions and calls the Multimedia service usage category shall be used, even for circuit-switched based telephony service.

The request is formed as defined in section 7.4.2.1.

2) For fix or mobile-based and wlan-based network access sessions the network access service usage category shall be used.

The request is formed as defined in section 7.4.3.1.

7.4.8.2 Combined network access and multimedia service usage response elements

This section covers the elements and fields for the response for the EP_38_HD combined network access and multimedia service usage for emergency paging.

There are two types of responses:

1) For multimedia and telephony sessions and calls the Multimedia service usage category shall be used, even for circuit-switched based telephony service.

The response structure for telephony and multimedia sessions and calls is identical to the section 7.4.2.2

2) For mobile-based and wlan-based network access sessions the network access service usage category shall be used.

The response structure for mobile-based and wlan-based network access sessions is identical to the section 7.4.3.2

7.5 Historical data handover interface requirements and options

The handover interface is used for the transmission of the PTSS requests and CSP responses for retroactive data. The data is encoded in one or several XML files.

Delivery of the historical data is possible with the following techniques:
- HTTPS

If HTTPS transactions are not possible or as a fallback solution in case of technical problem:
- Secure Email (using OpenPGP)
- Portable physical storage media (e.g., CD or DVD or HDD)

The PTSS determines based on consultations with CSP the delivery method.

NOTE: This interface requirements and options are also used for the handover interface used for the Information Requests specified in section 8.

Clause ETSI TS 102 657 V2.6.1	Selection of ETSI options for Switzerland	Additional requirements or specifications
4.1	**Reference model -** NOTE 1: PTSS is the only authorised organisation.	
4.1	**Reference model -** issuing and receiving authority: PTSS is the issuing and receiving authority.	
4.4	**Handover Interface port 1 (HI-A) and Handover Interfaceport 2 (HI-B)** HI-A and HI-B may cross borders between Switzerland and other countries	
4.5 / 7.1	**Model used for the RDHI** Encoding and delivery technique uses HTTPS and XML as described in clause 7.2.	
5.1.5.1	**Errors and failure types**	Amendment to text for the sake of consistency with clause 5.1.5.3 2) Errors: If one party makes a syntactical or protocol-level error (e.g., badly-formatted XML or invalid authorisation), the other party shall return an error. The message with the mistake is then ignored (see clause 5.1.5.3).

Clause ETSI TS 102 657 V2.6.1	Selection of ETSI options for Switzerland	Additional requirements or specifications
5.1.5.3	**Other errors**	According to ETSI this clause is confined to the direction from Authorised Organisation to CSP → "If the CSP receives …" For the sake of consistency with clause 5.1.5.1 Item 2) errors detected by the Authorised Organisation shall be handled accordingly.
5.1.5.4	**Missing messages**	When no response is received to an HTTP POST within 15 seconds, PTSS will repeat the request after a waiting time of 30 seconds. If this repeated request is also not answered within 15 seconds, the request will be considered as failed. The Authorised Organisation and each CSP shall describe the "appropriate" actions to resolve the missing messages error situation and document it in a separate document.
5.1.7	**Delivery of results** The multi-part delivery option must be implemented and be used to allow for an immediate data delivery.	
5.2	**Message flows for general situation** This is the only option used in Switzerland for HI-A and HI-B implementations. NOTE: This implies that the mutual client/server arrangement according to clause 7.2.3 shall be supported.	A specific handover interface solution for small and medium CSP is available
5.2.1	**Delivery of a response**	While "Cancellation of request" is used in Switzerland, it may happen that the CSP side receives a "cancelMessage" while delivering results. This procedure shall not impact the CSP and PTSS shall accept to receive all the delivered data without leading to an alarm or error condition.

Clause ETSI TS 102 657 V2.6.1	Selection of ETSI options for Switzerland	Additional requirements or specifications
5.2.2	**Cancellation of request** “Cancellation of request” can be used in Switzerland.	The using of the “cancellation of request” shall not impact an ongoing delivery process by the CSP and shall not lead to an alarm or error condition. PTSS shall accept all data delivered by the CSP even after a “cancelMessage”. PTSS shall deal accordingly with the delivered data.
5.2.3	**Multi-part delivery** In case of Multi-part delivery the option “sequential delivery” shall be used.	
5.3	**Message flows for Authorised-Organisation-initiated scenario** The scenario Authorised-Organisation-initiated is not allowed at the Authorised Organisation side. As a consequence CSPs do not need to support this mode of message flow. NOTE: This implies that the single client/server arrangement according to clause 7.2.2 is not used.	
5.4	**Message types for HI-A and HI-B; issuing and receiving Authority** PTSS acts as the issuing and receiving Authority.	
5.5	**HI-A and HI-B addressing**	Addresses are defined in a separate bilateral document between the Authorised Organisation and CSP.
6.1.2	**RequestID field specification** The Authorised Organisation code is managed and delivered exclusively by PTSS.	
6.1.3.1	**CSP Identifiers** CSPID codepoints are managed and delivered exclusively by PTSS.	
6.1.3.2	**Third Party CSP Identifiers** The thirdPartyCSPID shall be agreed on a national basis and shall follow the same rules and format as for the CSPID field.	The use of thirdPartyCSP Identifiers is not supported.

Clause ETSI TS 102 657 V2.6.1	Selection of ETSI options for Switzerland	Additional requirements or specifications
6.1.5	**RequestType** The requestType parameter is provided by PTSS in the header of the request. The CSP shall include the same requestType in the header of the response.	The requestType parameter is used for both Historical Data and Information Requests.
6.2.1	**Retained Data response; General** Retained data responses are from the same service and the same category.	
6.2.3	**Volatile information** Option 2 is preferred. The CSP shall inform PTSS which option it implements.	
6.3.1	**Retained Data requests; Information contained within a request** The XPATH notation method is not used in Switzerland.	
6.3.3.1	**Priority of a request** Priority indication shall be used.	The priority parameter "requestPriority" is specified with two priorities: 00 = Urgent / Dringend / Urgent 01 = Normal If the parameter "requestPriority" is not present the request shall be treated as regular "01".
6.3.3.2	**Maximum hits** Maximum hits is not used.	
6.3.3.3	**Maximum records per batch** The PTSS determines based on consultations with the CSP the use and the maximum value of the MaxRecordsPerBatch. Its value may vary from one category to another (e.g., Networks Access ≠ Mutlimedia). It is only used for the Historical Data.	
6.3.3.4	**Number of records limit** The number of records limit method shall be implemented. When the number of records found is lower or equal than the limit indicated in the request, the numberOfRecordsFound parameter must not be sent in the ResponseMessage.	Number of records limit is used only for the Information Requests specified in section 8.
6.4	**Error messages** CategorisedErrorDescription list and values see section 7.5.1	

Clause ETSI TS 102 657 V2.6.1	Selection of ETSI options for Switzerland	Additional requirements or specifications
7.2.1	**Basic configuration** Mutual client/server configuration shall be used.	The party that wants to send a message (including acknowledgements) takes the initiative to exchange data.
7.2.2	**Single client/server** This arrangement does not apply to Switzerland NOTE: This is caused by the fact that the Message flows for Authorised-Organisation-initiated scenario (according to clause 5.3) are not used in Switzerland.	
7.2.3	**Mutual client/server** This arrangement shall be supported. NOTE: This is caused by the fact that the Message flows for general situation (according to clause 5.2) are used in Switzerland.	The PTSS determines based on consultations with each CSP the definition of the URI. On PTSS side the client uses the following timeout and retries configuration: Connection timeout: 10 seconds Read timeout: 30 seconds Retry policy: every 1 minute, 15 retries Final failure: Alert/requeue for manual processing.
7.2.4	**Details common to both single and mutual cases** The POST method shall be used. The content-type text/xml shall be used.	
7.3	**Direct TCP data exchange** Direct TCP is not used in Switzerland.	
8	**Security measures** Section 9 describes the connection level security.	
8.2	**Connection Level Security** Implementations shall support HTTPS as defined in IETF RFC 2818, including the support for mutual authentication through bidirectional certificate usage.	The exchange of the certificates and security requirements (such as key management, key length and the choice of cryptographic algorithm) is an implementation issue and is determined by the the PTSS based on consultations with the CSP.

Clause ETSI TS 102 657 V2.6.1	Selection of ETSI options for Switzerland	Additional requirements or specifications
Annexes	**XML Schema definition** The version of the supported XML schema, definition must be explicitly announced by PTSS.	See section 7.6 and 8.6 The following changes are applicable in Switzerland to the ETSI published xsd: The elements “MsgSubscriberID”, “MsgStoreID”, “MultimediaBillingIdentifier”, “MultimediaDeviceID” are defined with a type “string” instead of “hexBinary”, as <xsd:simpleType name="**MsgSubscriberID**"> <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> <xsd:simpleType name="**MsgStoreID**"> <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> <xsd:simpleType name="**MultimediaBillingIdentifier**"> <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> <xsd:simpleType name="**MultimediaDeviceID**"> <xsd:restriction base="**xsd:string**"/> </xsd:simpleType>
Annex I [Informative]	**Manual techniques** Manual techniques should be used when no electronic interface is available (e.g., in case of failure). The PTSS determines based on consultations with CSP the use of the manual technique.	Manual techniques include: - Use of secure email for the HI-A interface according to section 3. - Use of portable storage media (e.g., CD or DVD) or secure email or FTP for the HI-B interface. Whenever possible the ETSI RD encoding scheme should be used as indicated in Annex 1 sections 7.3, 7.4, 8.3 and 8.4.

Table 7-10: ETSI TS 102 657 V2.6.1 requirements and options

7.5.1 Categorised error description and values list

The following table provides the application level categorised error description and values according to ETSI TS 102 657 V2.6.1 clause 6.4

Error value	Error Description
3000	General Business Logic Error.
3001	Invalid XML - parsing error
3002	Duplicate RequestID detected.
3003	Transient Technical Error.
4000	Unknown or wrong target identifier.

Table 7-11: Categorised error description and values list

7.6 Applicable XML schema version for retroactive interceptions (historical data)

Any superior version can be adopted by the CSP for better performances. This must be agreed with the PTSS in order to ensure the compatibility with the current Retained Data Component systems, and this requires a new compliance assessment.

Applicable XML Schema	Requirement or instruction for application
ETSI TS 102 657 V2.6.1	
RDMessage XML Schema (xsd)	RDMessage33.xsd xmlns="http://uri.etsi.org/02657/v2.6.1#/RetainedData" The following changes are applicable in Switzerland to the ETSI published xsd: The elements “MsgSubscriberID”, “MsgStoreID”, “MultimediaBillingIdentifier”, “MultimediaDeviceID” are defined with a type “string” instead of “hexBinary”, as <xsd:simpleType name="**MsgSubscriberID**"> <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> <xsd:simpleType name="**MsgStoreID**"> <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> <xsd:simpleType name="**MultimediaBillingIdentifier**"> <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> <xsd:simpleType name="**MultimediaDeviceID**"> <xsd:restriction base="**xsd:string**"/> </xsd:simpleType>

Table 7-12: Applicable XML schema version for historical data interceptions

8 Information Requests

8.1 General

This section covers the general technical requirements related to the legal provisions set in sections 4 to 6 of the ordinance VÜPF that need to be fulfilled by the PTSS and the CSP when requesting, respectively providing the information. The format for the requests and responses are based on the technical specification ETSI TS 102 657 V2.6.1, with the exception of IR_52_ASSOC_TEMP which is based on ETSI TS 103 120 V1.9.1.

8.2 Information request types

The tables below list the information requests types specified in the ordinance VÜPF.

Information requests for network access			
VÜPF article	**Type & Description** (Informative translation)	**Identifiers Handover Interfaces**	**Section**
35 27	**IR_4_NA** **IR_5_NA_FLEX** Information about the subscriber of the network access service	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and E	8.4.1.1 8.4.1.2
36	**IR_6_NA** Service information about the network access	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and E	8.4.1.3 8.4.1.4
37	**IR_7_IP** Identification of a user by its unique assigned IP address	Identifiers parameters ETSI TS 102 657 2.6.1 Annexes A and E	8.4.1.5 8.4.1.6
38	**IR_8_IP (NAT)** Identification of a user by its shared assigned IP address	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and E	8.4.1.7 8.4.1.8
39	**IR_9_NAT** Network Address Translation (NAT) information	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and E	8.4.1.9 8.4.1.10

Table 8-1: Information requests for network access types

Information requests for telecommunication applications			
VÜPF article	**Type & Description** (Informative translation)	**Identifiers Handover Interfaces**	**Section**
40 27	**IR_10_TEL** **IR_11_TEL_FLEX** Multimedia and telephony subscription information	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and D	8.4.2.1 8.4.2.2
41	**IR_12_TEL** Multimedia and Telephony services information	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and D	8.4.2.3 8.4.2.4
42 27	**IR_13_EMAIL** **IR_14_EMAIL_FLEX** Message subscription information	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and C	8.4.3.1 8.4.3.2
43 27	**IR_15_COM** **IR_16_COM_FLEX** Communication service subscription information	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and E	8.4.4.1 8.4.4.2

Table 8-2: Information requests for telecommunication applications types

Information requests for billing and payment and contracts of telecommunication services			
VÜPF article	**Type & Description** (Informative translation)	**Identifiers Handover Interfaces**	**Section**
44	**IR_17_PAY** Payment details information for all services	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and D	8.4.5.1 8.4.5.2
45	**IR_18_ID** Identity document copy for all services	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and D	8.4.6.1 8.4.6.2
46	**IR_19_BILL** Billing document copy for all services	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and D	8.4.7.1 8.4.7.2
47	**IR_20_CONTRACT** Contract document copy for multimedia and telephony services	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and D	8.4.8.1 8.4.8.2

Table 8-3: Information requests for billing and payment and contracts of telecommunication services

Information requests for technical network information and assigned identifiers			
VÜPF article	**Type & Description** (Informative translation)	**Identifiers Handover Interfaces**	**Section**
48	**IR_21_TECH** Technical data for mobile and WLAN network access information	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and E	8.4.9.1 8.4.9.2
48 a	**IR_51_ASSOC_PERM** Association of subscription based assigned identifiers for specific telecommunications service	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and D	8.4.10.1 8.4.10.2
48 b	**IR_52_ASSOC_TEMP** Association of temporary to permanent identifiers in real-time	ETSI TS 103 120 V1.9.1 & ETSI TS 133 128 V18.12.0	8.4.12
48 c	**IR_53_TEL_ADJ_NET** Identification of the adjacent network from which the communication or communication attempt originated from or was sent to.	Identifiers parameters ETSI TS 102 657 V2.6.1 Annexes A and D	8.4.11.1 8.4.11.2

Table 8-4: Information requests for technical network information and assigned identifiers

8.3 Common identifiers and parameters of the handover interfaces

This section provides the description of the common parameters and identifiers that are present in the headers of the information requests, with the exception of the IR_52_ASSOC_TEMP, to be sent by the PTSS and the repsonses to be sent by the CSP.

8.3.1 XML elements of the header for information requests by PTSS

The information contained in the XML header is based on the specification ETSI TS 102 657 V2.6.1 clauses 6.1 and 6.2

Element or attribute	Description	Example
rdHeaderId	Object Identifier	0.4.0.2.3.0.33
retainedDataHeader		
requestID		
countryCode	A country code as per ISO 3166-1 (2013)	CH
authorisedOrganisationID	Organisation that requested the data.	PTSS
requestNumber	Unique reference of the request (instruction). It is provided by PTSS and serves as reference for the administration of the request.	IR_201707121234567
externalIdentifier	Parameter to correlate one or several requests. Format: string	IR_20170712123456
cSPID	Five-digit number provided by PTSS to identify each CSP.	99908
timeStamp	The local date and time when the request was created. Formatted as "GeneralizedTime" in UTC	20160319131625.347Z
requestType	Request type provided by PTSS	IR_4_NA IR_5_NA_FLEX IR_10_TEL IR_11_TEL_FLEX
retainedDataPayload		
requestMessage		
requestParameters	This structure contains a sequence of request criteria. Each criterion shall be expressed as a RequestConstraints parameter. It is structured in two main parts: The first part specifies the service,	RequestConstraints elements: equals lessThanOrEqualTo greaterThanOrEqualTo

	category and target identity with the parameter “equals”. The second part provides the time period interval with the parameters “lessThanOrEqualTo” and “greaterThanOrEqualTo” for which the information requests records shall be delivered by the CSP. The time indication shall be in UTC. A request can only ask for information of one target identity of one service and one category.	
deliveryPointHIB	Delivery point where the information data must be sent to. In case of electronic delivery it will be an URI	URI: https://ptss-host[nn].lidn.ejpd.admin.ch/P/HIB/IRC/ (*where* [nn] *is a host-number defined by PTSS*).
numberOfRecordsLimit	The upper bound limit of the number of records allowed in the Information Request response.	10

Table 8-5: XML elements of the header for information requests by PTSS

8.3.2 XML elements of the header for information responses by CSP

The information contained in the XML header is based on the specification ETSI TS 102 657 V2.6.1 clauses 6.1 and 6.2.

Element or attribute	Description	Example
rdHeaderId	Object Identifier	0.4.0.2.3.0.33
requestID		
countryCode	A country code as per ISO 3166-1 (2013)	CH
authorisedOrganisationID	Organisation that requested the data.	PTSS
requestNumber	Unique reference of the request (instruction). It shall be populated with the character string provided in the element	IR_201707121234567

	"file-number" of the XML order.dtd file.	
cSPID	Five-digit number provided by PTSS to each CSP.	99908
timeStamp	Formatted as "GeneralizedTime"	20140319131625Z 20140319141625+0100
requestType	Request type provided by PTSS	IR_4_NA IR_5_NA_FLEX IR_10_TEL IR_11_TEL_FLEX
responseMessage		
responseStatus	Response status from CSP can be: - responseComplete: if all records related to the request are included. - responseIncomplete: if more records will be delivered later. Note: If the responseIncomplete is used then the parameter responseNumber must indicate the number of the multi-part delivery. - responseFailed: if the request cannot be fulfilled.	
responsePayload		
recordNumber	The recordNumber shall start at 0 and shall increment for each record delivered under the original request.	0, 1, 2, 3, etc...
numberOfRecordsFound	This parameter indicates the number of records found when the number of records has exceeded the limit set in the request by the numberOfRecordsLimit parameter. When the number of records found is lower than the requested limit this parameter is omitted in the response.	15

Table 8-6: XML elements of the header for information responses by CSP

8.4 Formats and coding requirements for information requests

8.4.1 Network access information requests and responses

The encoding and formats of the parameters for the network access information requests and responses relate to ETSI TS 102 657 V2.6.1 Annexes A and E.

8.4.1.1 IR_4_NA & IR_5_NA_FLEX request criteria elements and structure for subscription information

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the network access subscription information.

network access Subscriber		
Element or attribute	**Description**	**Example**
equals	Request constraint	
networkAccess	Service = networkAccess	
naSubscriber	Category = naSubscriber	
subscriberID	A unique identifier for this particular subscriber within the CSP.	123456789
naSubscriptions structure		
NAServiceSubscription	SEQUENCE	
naAuthID	Structure	
NAAuthID	Username or logon information	p.muster@example.com
IMSI	The International Mobile Subscriber Identity (IMSI) of the target. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
registeredICCIDs	SEQUENCE OF	
ICCIDInfo	SEQUENCE	
iCCID	Integrated Circuit Card ID of the subscriber (SIM)	89410228641400127777
eID	Identifier of the eUICC according to GSMA SGP.02 V4.3. (32 num.digits long)	321065498712345678907 41085296321
allocatedDevices	SEQUENCE OF	
NADevice	SEQUENCE	
dslID	DSL identifier as set by the CSP.	DSL-134523
subscriberID	An alternative identifier for the subscriber using a specific service of the CSP. To be used only when it differs from the subscriberID defined in the NASubscriber sequence.	NA7654321
mSISDNs	SEQUENCE OF	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this subscription.	41771112233
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com

gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
subscriber structure		
GenericSubscriberInfo	SEQUENCE	
OrganizationInfo	SEQUENCE	
name	Name of the organisation (corporate, foundation, etc...)	FOOBAR AG
contactDetails	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	5578
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
nationalRegistrationID	Unique reference for this organisation as in the Swiss UID Register (uid.admin.ch) or the LEI (lei.admin.ch)	CHE-777.888.999
IndividualInfo	SEQUENCE	
PersonName	SEQUENCE	
surname	First the surname(s) and then the firstname(s). Without prefixes (e.g. Dr., Me.) and suffixes (e.g. Junior, Senior, Second, Third)	Muster Da Silva Joe Von der Heide Peter Hans De Pourtalès Léon Liu Jianguo Al-Shammari Fahd Abdul
contactAddress	SEQUENCE	
address	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	6897
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
dateOfBirth	Subscriber's date of birth. Only the year, month and day information shall be taken into account. Any other indication shall be discarded.	19920611000000Z
AuthenticationInfo	SEQUENCE	

authenticationType	Description of the type of document used to authenticate, e.g. passport, ID card	ID card Passport
authenticationNumber	The number of the document used to authenticate	E12345678

8.4.1.2 IR_4_NA & IR_5_NA_FLEX response elements and structure for subscription information

This section covers the information response elements and fields of the Network access subscriber records according to ETSI TS 102 657 V2.6.1 Annexes A and E.

network access Subscriber		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
networkAccess	Service = networkAccess	
naSubscriber	Category = naSubscriber	
subscriberID	A unique identifier for this particular subscriber within the CSP.	123456789
naSubscriptions structure		
naSubscriptions	SEQUENCE OF	
NAServiceSubscription	SEQUENCE	
validity	Structure	
TimeSpan	SEQUENCE	
startTime	Start time of the subscribed service	20100611000000Z
endTime	End time of the subscribed service	20160731000000Z
naServiceID	Identifier for the service according to the CSP.	Internet Access Mobile Unlimited
naAuthID	Structure	
NAAuthID	Username or logon information	p.muster@example.com
options	Indicates any option or specific information to the subscription.	Multi-Identity Multi-Device Primary Secondary
installationAddress	Structure composed of the installation address of the subscriber's equipment, if applicable.	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
postalCode	Postal code of the city	9999
city	City	Ortdorf

country	Country code as defined in ISO 3166-1 (2013)	CH
validity	structure	
TimeSpan	SEQUENCE	
startTime	Start time of the installation	20100611000000+0200 20100611000000Z
endTime	End time of the installation, if applicable.	20150630000000+0200 20150630000000Z
fixIpAddress	Fix IP address assigned to the subscriber in text format, if applicable.	203.0.113.25 2001:DB8:7401::EDF:BDD7
naServiceStatus	Information about the status of the subscribed service.	active ceased suspended
additionalIPAddresses	IP addresses assigned to the subscriber. When the IP addresses or ranges or prefix assigned to the subscriber have different time of validity, the structure timedIPAddresses shall be used.	
IPAddressSetOrRangeOrMask	CHOICE	set, range,
set	Sequence of IP addresses	
iPTextAddress		203.0.113.25 2001:DB8:7401::EDF:BDD7
range		
prefix	IP address in text format	203.0.113.0 2001:DB8::
subnetlength	IP subnet length integer	24 32
subscriptionType	Structure	
SubscriptionType	ENUMERATED	unknown postpay prepay other
resellerAddress	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	28
streetName	Street name	Beispielstrasse
postalCode	Postal code of the city	9989
city	City	Beispielstadt
country	Country code as defined in ISO 3166-1 (2013)	CH
relatedOrganizationInfo	Structure	
OrganizationInfo	SEQUENCE	
name	Name of the reseller organisation	CheapMobile SA
createTime	Time that subscriber account was created by the reseller organisation.	20160525134000+0200 20160525134000Z

relatedPersonName	PersonName	
PersonName	SEQUENCE	
surname	The reseller surname(s) and firstname(s), as well as the prefixes and suffixes if applicable, are provided in this field only.	Muster Joe
allocatedDevices	SEQUENCE OF	
NADevice	SEQUENCE	
macAddress	MAC address of the allocated equipment	54A6FA471B3C
dslID	DSL identifier as set by the CSP.	DSL-134523
subscriberID	An alternative identifier for the subscriber using a specific service of the CSP. To be used only when it differs from the subscriberID defined in the NASubscriber sequence.	NA7654321
mSISDNs	SEQUENCE OF	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this subscription.	41771112233
registeredICCIDs	SEQUENCE OF	
ICCIDInfo	SEQUENCE	
iCCID	Integrated Circuit Card ID of the subscriber (SIM)	89410228641400127777
iMSI	The International Mobile Subscriber Identity (IMSI) of the subscriber. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier	joe@example.com

	according to IETF RFC 4282.	
eID	Identifier of the eUICC according to GSMA SGP.02 V4.3. (32 num.digits long)	321065498712345678907 41085296321
timedIPAddresses	SEQUENCE OF	
IPAddressSetOrRange OrMask	CHOICE	set, range,
set	Sequence of IP addresses	
iPTextAddress		203.0.113.25 2001:DB8:7401::EDF:BDD7
range		
prefix	IP address in text format	203.0.113.0 2001:DB8::
subnetlength	IP subnet length integer	24 32
validity		
TimeSpan	SEQUENCE	
startTime	Start time of the subscribed IP address or range or prefix	20100611000000+0200 20100611000000Z
endTime	End time of the subscribed IP address or range or prefix	20160731000000+0200 20160731000000Z
subscriber structure		
GenericSubscriberInfo	SEQUENCE	
OrganizationInfo	SEQUENCE	
name	Name of the organisation (corporate, foundation, etc...)	FOOBAR AG
contactDetails	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	5578
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
validity	Structure	
TimeSpan	SEQUENCE	
startTime	Start time of the period of the subscription information.	20160725113000+0200 20160725113000Z
endTime	End time of the period of the subscription information.	20160725113800+0200 20160725113800Z
emailAddress	Email address of the organisation	info@foobar.ch
contactNumber	SEQUENCE OF	

PartyNumber	Phone number(s) of the organisation	41771112233
nationalRegistrationID	Unique reference for this organisation as in the Swiss UID Register (uid.admin.ch) or the LEI (lei.admin.ch)	CHE-777.888.999
relatedPersonName	SEQUENCE	
surname	Name of the individual that signed the contract on behalf of the organization	Hans Muster
IndividualInfo	SEQUENCE	
PersonName	SEQUENCE	
surname	The surname(s) and firstname(s), as well as the prefixes and suffixes if applicable, are provided in this field only.	Muster Da Silva Joe
contactAddress	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	5578
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
validity	Structure	
TimeSpan	SEQUENCE	
startTime	Start time of the period of the subscription information.	20160725113000+0200 20160725113000Z
endTime	End time of the period of the subscription information.	20160725113800+0200 20160725113800Z
emailAddress	Email address of the organisation	joe.muster@cspdomain.ch
contactNumber	SEQUENCE OF	
PartyNumber	Phone number(s) of the subscriber	41319998877
dateOfBirth	Subscriber's date of birth. Only the year, month and day information shall be taken into account. Any other indication shall be discarded.	19920611000000Z
gender	ENUMERATED	male female other
AuthenticationInfo	SEQUENCE	
authenticationType	Description of the type of document used to	ID card Passport

	authenticate, e.g. passport, ID card	
authenticationNumber	The number of the document used to authenticate	E12345678
issuingCountry	The country that issued the document used to authenticate, as specified in ISO 3166-1.	CH
issuingOrganization	The organization that issued the document used to authenticate.	United Nations HCR
nationality	The nationality of the subscriber, if indicated on the document used to authenticate.	CH
profession	Profession of the subscriber, if available.	Consultant

8.4.1.3 IR_6_NA request criteria elements and structure for service information

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the network access service information.

Network access service		
Element or attribute	**Description**	**Example**
equals	Request constraint	
networkAccess	Service = networkAccess	
naSubscriber	Category = naSubscriber	
naSubscriptions structure		
NAServiceSubscription	SEQUENCE	
naAuthID	Identifier used by the subscriber to register and/or authenticate to the network access service (e.g. user name, logon name, MSISDN)	joe@example.com 41771112233
installationAddress	Structure composed of the installation address of the subscriber's equipment, if applicable.	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
IMSI	The International Mobile Subscriber Identity (IMSI) of the target.	228993035511773F

	(IMSI is 15 digits long + last digit "F" as a filler half-octet)	
allocatedDevices	SEQUENCE OF	
NADevice	SEQUENCE	
macAddress	Media Access Control address according to IEEE 802. (6 octets)	54A6FA471B3C
dslID	DSL identifier as set by the CSP.	DSL-134523
IMEI	International Mobile Equipment Identity	359040082042280F
subscriberID	An alternative identifier for the subscriber using a specific service of the CSP. To be used only when it differs from the subscriberID defined in the NASubscriber sequence.	NA7654321
mSISDNs	SEQUENCE OF	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this subscription.	41771112233
registeredICCIDs		
ICCIDInfo		
iCCID	Integrated Circuit Card ID of the subscriber (SIM)	89410228641400127777
eID	Identifier of the eUICC according to GSMA SGP.02 V4.3. (32 num.digits long)	321065498712345678907 41085296321
paymentTransactions	SEQUENCE OF	
BillingRecords	Contains information for a particular paid service.	
method	Described the method of payment, such as a voucher.	voucher mobile voucher
transactionID	The reference number of the voucher.	61167648018632
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com

8.4.1.4 IR_6_NA response elements and structure for service information

This section covers the information response elements and fields of the Network access subscriber records according to ETSI TS 102 657 V2.6.1 Annexes A and E.

Network access service		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
networkAccess	Service = networkAccess	
naSubscriber	Category = naSubscriber	
subscriberID	A unique identifier for this particular subscriber within the CSP.	123456789
naSubscriptions structure		
NAServiceSubscription	SEQUENCE	
validity	Structure	
TimeSpan	SEQUENCE	
startTime	Start time of the period of the subscription information.	20160725113000Z
endTime	End time of the period of the subscription information.	20160725113800Z
naAuthID	Identifier used by the subscriber to register and/or authenticate to the network access service (e.g user name, logon name, MSISDN)	joe@example.com 41771112233
options	Indicates if it's a primary or secondary device in case of Multi-Device subscription. One record per device shall be delivered.	Primary Secondary
allocatedDevices	SEQUENCE OF	
NADevice	SEQUENCE	
description	Human readable description of the device related to the service subscription.	Mobile phone cable modem
macAddress	Media Access Control address according to IEEE 802. (6 octets)	54A6FA471B3C
dslID	DSL identifier as set by the CSP.	DSL-134523
IMEI	International Mobile Equipment Identity	357160045577020F
subscriberID	An alternative identifier for the subscriber using a specific service of the CSP. To be used only when it differs from the subscriberID defined in the NASubscriber sequence.	NA7654321
mSISDNs	SEQUENCE OF	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this subscription.	41771112233
registeredICCIDs	SEQUENCE OF	
ICCIDInfo	SEQUENCE	

iCCID	Integrated Circuit Card ID of the subscriber (SIM)	89410228641400127777
timeSpan	Structure	
TimeSpan	SEQUENCE	
startTime	Start time of the subscribed service	20100611000000+0200 20100611000000Z
endTime	End time of the subscribed service	20160731000000+0200 20160731000000Z
pUK	PIN Unlock Key code for the SIM card associated with the subscription	
pUK2	PIN Unlock Key 2 code for the SIM card associated with this subscription	
iMSI	The International Mobile Subscriber Identity (IMSI) of the target. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
eID	Identifier of the eUICC according to GSMA SGP.02 V4.3. (32 num.digits long)	321065498712345678907 41085296321

8.4.1.5 IR_7_IP request criteria elements and structure for identification of a user by its unique assigned IP address

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the network access service usage.

Network access service		
Element or attribute	**Description**	**Example**
equals	Request constraint	
networkAccess	Service = networkAccess	
naServiceUsage	Category = naServiceUsage	

naAssignedAddress structure		
NAAssignedAddress	SEQUENCE	
addressSetOrRangeOrMask	SEQUENCE	
IPaddressSetOrRangeOrMask	CHOICE	
set	SEQUENCE OF	
IPAddress	CHOICE	
iPTextAddress		198.51.100.25 2001:DB8:7401::bdd7
lessThanOrEqualTo	Request constraint	
networkAccess	Service = networkAccess	
naServiceUsage	Category = naServiceUsage	
interval		
Timespan		
startTime	GeneralizedTime	20200604103324Z
greaterThanOrEqualTo	Request constraint	
networkAccess	Service = networkAccess	
naServiceUsage	Category = naServiceUsage	
interval		
Timespan		
startTime	GeneralizedTime	20200604103324Z

8.4.1.6 IR_7_IP response elements and structure for identification of a user by its unique assigned IP address

This section covers the information response elements and fields of the Network access subscriber records according to ETSI TS 102 657 V2.6.1 Annex E.

Network access Service Usage		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
networkAccess	Service = networkAccess	
naServiceUsage	Category = naServiceUsage	
naServiceUsage structure		
NAServiceUsage	SEQUENCE	
gprsInformation	SEQUENCE	
iMSI	The International Mobile Subscriber Identity. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
mSISDN	The MSISDN associated with the network access. It shall be provided in international format.	41751112233
subscriberID	A unique identifier for this particular subscriber within the CSP. Voucher	123456789

	or boarding pass identifiers can also be reported with this element.	
naDevice	Structure	
description	Human readable description of the device related to the service subscription.	Mobile phone cable modem
macAddress	Media Access Control address according to IEEE 802. (6 octets)	54A6FA471B3C
dslID	DSL identifier as set by the CSP.	DSL-134523
subscriberID	An alternative identifier for the subscriber using a specific service of the CSP. To be used only when it differs from the subscriberID defined in the NASubscriber sequence.	NA7654321
fiveGSInformation	SEQUENCE	
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com

8.4.1.7 IR_8_IP (NAT) request criteria elements and structure for identification of a user by its shared assigned IP address

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the network access service usage.

Network access service		
Element or attribute	**Description**	**Example**
equals	Request constraint	
networkAccess	Service = networkAccess	
naServiceUsage	Category = naServiceUsage	
addressTranslationRecords structure		
addressTranslationRecord	SEQUENCE	
publicIPAddress	Structure	
IPAddress	CHOICE	

iPTextAddress	The translated IP address of the host, i.e. the address known by the remote host in text format.	203.0.113.45
publicPort	CHOICE	
singlePort	The translated port of the host.	32658
portRange	SEQUENCE OF	
PortRange	SEQUENCE	
lowerBound	Lower bound port number of the range	30000
upperBound	Upper bound port number of the range	30999
destinationIPAddress	The IP address of the remote host.	
IPAddress	CHOICE	
iPTextAddress	The IP address of the destination host.	198.51.100.24
destinationPort	The port of the remote host	44214
connectionType	ENUMERATED The protocol used for the session.	udp tcp sctp other
lessThanOrEqualTo	Request constraint	
networkAccess	Service = networkAccess	
naServiceUsage	Category = naServiceUsage	
interval		
Timespan		
startTime	GeneralizedTime	20200604103324Z
greaterThanOrEqualTo	Request constraint	
networkAccess	Service = networkAccess	
naServiceUsage	Category = naServiceUsage	
interval		
Timespan		
startTime	GeneralizedTime	20200604103324Z

8.4.1.8 IR_8_IP (NAT) response elements and structure for identification of a user by its shared assigned IP address

This section covers the information response elements and fields of the Network access subscriber records according to ETSI TS 102 657 V2.6.1 Annex E.

Network access Service Usage		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
networkAccess	Service = networkAccess	
naServiceUsage	Category = naServiceUsage	

naServiceUsage structure		
NAServiceUsage	SEQUENCE	
GprsInformation	SEQUENCE	
iMSI	The International Mobile Subscriber Identity (IMSI) associated with the network access. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
mSISDN	The MSISDN associated with the network access. It shall be provided in international format.	41771112233
subscriberID	A unique identifier for this particular subscriber within the CSP. Voucher or boarding pass identifiers can also be reported with this element.	123456789
naDevice	Structure	
description	Human readable description of the device related to the service subscription.	Mobile phone cable modem
macAddress	Media Access Control address according to IEEE 802. (6 octets)	54A6FA471B3C
dslID	DSL identifier as set by the CSP.	DSL-134523
subscriberID	An alternative identifier for the subscriber using a specific service of the CSP. To be used only when it differs from the subscriberID defined in the NASubscriber sequence.	NA7654321
fiveGSInformation	SEQUENCE	
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com

8.4.1.9 IR_9_NAT request criteria elements and structure for network access translation information

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the network access service usage.

Network access service		
Element or attribute	**Description**	**Example**
equals	Request constraint	
networkAccess	Service = networkAccess	
naServiceUsage	Category = naServiceUsage	
addressTranslationRecords structure		
addressTranslationRecord	SEQUENCE OF	
privateIPAddress	Source IP address before the NAT instance	
IPAddress	CHOICE	
iPTextAddress	The private IP address of the host.	192.168.0.24
privatePort	Source port before the NAT instance	25871
publicIPAddress	Source IP address after the NAT instance	
IPAddress	CHOICE	
iPTextAddress	The translated IP address of the host, i.e. the address known by the remote host in text format.	203.0.113.45
publicPort	CHOICE Source port after the NAT instance on the public side. It can be either a single port (using singlePort) or a port range (using portRange).	
singlePort	The translated port of the host.	32658
portRange	SEQUENCE OF	
PortRange	SEQUENCE	
lowerBound	Lower bound port number of the range	30000
upperBound	Upper bound port number of the range	30999
destinationIPAddress	The IP address of the remote host.	
IPAddress	CHOICE	
iPTextAddress	The IP address of the destination host.	198.51.100.24
destinationPort	The port of the remote host	44214
connectionType	ENUMERATED The protocol used for the session.	udp tcp sctp other
lessThanOrEqualTo	Request constraint	
networkAccess	Service = networkAccess	
naServiceUsage	Category = naServiceUsage	
interval		

Timespan		
startTime	GeneralizedTime	20200604103324Z
greaterThanOrEqualTo	Request constraint	
networkAccess	Service = networkAccess	
naServiceUsage	Category = naServiceUsage	
interval		
Timespan		
startTime	GeneralizedTime	20200604103324Z

8.4.1.10 IR_9_NAT response elements and structure for network access translation information

This section covers the information response elements and fields of the Network access subscriber records according to ETSI TS 102 657 V2.6.1 Annex E.

Network access Service Usage		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
networkAccess	Service = networkAccess	
naServiceUsage	Category = naServiceUsage	
naServiceUsage structure		
privateIPAddress	Source IP address before the NAT instance.	
IPAddress	CHOICE	
iPTextAddress	The private IP address of the host.	192.168.0.24
privatePort	The source port before the NAT instance.	25871
publicIPAddress	Source IP address after the NAT instance.	
IPAddress	CHOICE	
iPTextAddress	The translated IP address of the host, i.e. the address known by the remote host in text format.	203.0.113.45
publicPort	CHOICE Source port after the NAT instance on the public side. It can be either a single port (using singlePort) or a port range (using portRange)	
singlePort	The translated port of the host.	32658
portRange	SEQUENCE OF	
PortRange	SEQUENCE	
lowerBound	Lower bound port number of the range	30000
upperBound	Upper bound port number of the range	30999

Depending on the Network Address Translation instance configuration and capabilities, either the "privateIPAddress" and "privatePort" before the NAT instance or the "publicIPAddress" and "publicPort" after the NAT instance shall be reported.

8.4.2 Multimedia and telephony information requests and responses

The encoding and formats of the parameters for the multimedia and telephony information requests and responses relate to ETSI TS 102 657 V2.6.1 Annexes A and D.

8.4.2.1 IR_10_TEL & IR_11_TEL_FLEX request criteria elements and structure for subscription information

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the telephony and multimedia subscription information. It uses the "multmediaSubscriber" structure as telephony is considered a subset of multimedia services.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
equals	Request constraint	
multimediaRecord	Service = multimedia	
multimediaSubscriber	Category = multimediaSubscriber	
subscriberID	Structure	
MultimediaSubscriberID	A unique identifier for this particular subscriber within the CSP.	123456789
genericSubscriberInfo structure		
GenericSubscriberInfo	SEQUENCE	
OrganizationInfo	SEQUENCE	
name	Name of the organisation (corporate, foundation, etc...)	FOOBAR AG
contactDetails	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	5578
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
nationalRegistrationID	Unique reference for this organisation as in the Swiss UID Register (uid.admin.ch) or the LEI (lei.admin.ch)	CHE-777.888.999

IndividualInfo	SEQUENCE	
PersonName	SEQUENCE	
surname	First the surname(s) and then the firstname(s). Without prefixes (e.g. Dr., Me.) and suffixes (e.g. Junior, Senior, Second, Third)	Muster Da Silva Joe Von der Heide Peter Hans De Pourtalès Léon Liu Jianguo Al-Shammari Fahd Abdul
contactAddress	SEQUENCE	
address	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	6897
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
dateOfBirth	subscriber's date of birth. Only the year, month and day information shall be taken into account. Any other indication shall be discarded.	19920611000000Z
AuthenticationInfo	SEQUENCE	
authenticationType	Description of the type of document used to authenticate, e.g. passport, ID card	ID card Passport
authenticationNumber	The number of the document used to authenticate	E12345678
subscribedMultimedia Services	SEQUENCE OF	
registeredIdentifiers	SEQUENCE OF	
PartyIdentity	Party identity of the multimedia or telephony subscriber.	41771112233 sip:+41771112233@csp.ch tel:+41771112233
iMSI	The International Mobile Subscriber Identity (IMSI) of the subscriber. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
registeredICCIDs	SEQUENCE OF	
ICCIDInfo	SEQUENCE	
iCCID	Integrated Circuit Card ID of the subscriber (SIM)	89410228641400127777
eID	Identifier of the eUICC according to GSMA SGP.02 V4.3. (32 num.digits long)	321065498712345678907 41085296321
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F

nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com

8.4.2.2 IR_10_TEL & IR_11_TEL_FLEX response elements and structure for subscription information

This section covers the information response elements and fields of the telephony and multimedia subscriber records according to ETSI TS 102 657 V2.6.1 Annexes A and D.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
multimediaRecord	Service = multimedia	
multimediaSubscriber	Category = multimediaSubscriber	
subscriberID	Structure	
MultimediaSubscriberID	A unique identifier for this particular subscriber within the CSP.	123456789
genericSubscriberInfo structure		
GenericSubscriberInfo	SEQUENCE	
OrganizationInfo	SEQUENCE	
name	Name of the organisation (corporate, foundation, etc...)	FOOBAR AG
contactDetails	SEQUENCE	
address	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	5578
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
validity	Structure	
TimeSpan	SEQUENCE	
startTime	Start time of the period of the subscription information.	20160725113000+0200 20160725113000Z
endTime	End time of the period of the subscription information.	20160725113800+0200 20160725113800Z
emailAddress	Email address of the contact person or the responsible unit in the organisation	Hans.Muster@foobar.ch ict.servicedesk@foobar.ch
contactNumber	SEQUENCE OF	
PartyNumber	Phone number(s) of the organisation	41771112233

nationalRegistrationID	Unique reference for this organisation as in the Swiss UID Register (uid.admin.ch) or the LEI (lei.admin.ch)	CHE-777.888.999
otherAddresses	SEQUENCE OF	
OtherAddress	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
relatedPersonName	SEQUENCE	
surname	Name of the individual that signed the contract on behalf of the organisation	Hans Muster
IndividualInfo	SEQUENCE	
PersonName	SEQUENCE	
surname	The surname(s) and firstname(s), as well as the prefixes and suffixes if applicable, are provided in this field only.	Muster Da Silva Joe
contactAddress	SEQUENCE	
address	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	6897
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
validity	Structure	
TimeSpan	SEQUENCE	
startTime	Start time of the period of the subscription information.	20160725113000+0200 20160725113000Z
endTime	End time of the period of the subscription information.	20160725113800+0200 20160725113800Z
emailAddress	Email address of the subscriber.	joe.muster@cspdomain.ch
contactNumber	SEQUENCE OF	
PartyNumber	Phone number(s) of the subscriber	41319998877
dateOfBirth	subscriber's date of birth. Only the year, month and day information shall be taken into account. Any other indication shall be discarded.	19920611000000Z
gender	ENUMERATED	male female other
AuthenticationInfo	SEQUENCE	
authenticationType	Description of the type of document used to authenticate, e.g. passport, ID card	ID card Passport

authenticationNumber	The number of the document used to authenticate	E12345678
issuingCountry	The country that issued the document used to authenticate, as specified in ISO 3166-1.	CH
issuingOrganization	The organization that issued the document used to authenticate.	United Nations HCR
nationality	The nationality of the subscriber, if indicated on the document used to authenticate.	CH
profession	Profession of the subscriber, if available.	Consultant
subscribedMultimedia Services	SEQUENCE OF	
serviceID	Identifier for the service according to the CSP.	Wireline Telephony Mobile Unlimited
timeSpan	Structure	
startTime	Start time of the service	20100225120000+0200 20100225120000Z
endTime	End time of the service, if applicable.	20160731120000+0200 20160731120000Z
registeredIdentifiers	SEQUENCE OF	
PartyIdentity	Representation of the same telephony or multimedia subscription party identity that can be delivered in different formats (e.g. MSISDN, SIP URI, TEL URI).	41771112233 sip:+41771112233@csp.ch tel:+41771112233
serviceType	The type of service subscribed to.	
MultimediaServiceType	ENUMERATED	private, privatePABX, publicPayphone, geographicalfixed, geographicalindependent,
installationAddress	Structure composed of the installation address of the subscriber's equipment, if applicable.	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
validity	structure	
TimeSpan	SEQUENCE	
startTime	Start time of the installation	20100611000000+0200 20100611000000Z

endTime	End time of the installation, if applicable.	20160731120000+0200 20160731120000Z
carrierPreselect	Indicates if a carrier preselection is active (true) or not (false).	false true
lineStatus	CSP-specific description of current line status. e.g., "Active", "Ceased", etc.	Active Ceased Suspended
subscriptionType	Describes the nature of the subscription	
SubscriptionType	ENUMERATED	unknown, postpay, prepay, other,
resellerAddress	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	28
streetName	Street name	Beispielstrasse
postalCode	Postal code of the city	9989
city	City	Beispielstadt
country	Country code as defined in ISO 3166-1 (2013)	CH
relatedOrganizationInfo	Structure	
OrganizationInfo	SEQUENCE	
name	Name of the reseller organisation	CheapMobile SA
createTime	Time that subscriber account was created by the reseller organisation.	20160525134000+0200
relatedPersonName		
PersonName	SEQUENCE	
surname	The reseller surname(s) and firstname(s), as well as the prefixes and suffixes if applicable, are provided in this field only.	Muster Joe
multimediaServiceType	Indicates any option or specific information to the subscription.	Multi-Identity Multi-Device Primary Secondary
registeredICCIDs	SEQUENCE OF	
ICCIDInfo		
iCCID	Integrated Circuit Card ID of the subscriber (SIM)	89410228641400127777
iMSI	The International Mobile Subscriber Identity (IMSI) of the subscriber. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F

nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
eID	Identifier of the eUICC according to GSMA SGP.02 V4.3. (32 num.digits long)	321065498712345678907 41085296321

8.4.2.3 IR_12_TEL request criteria elements and structure for service information

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the telephony and multimedia service information. It uses the "multmediaSubscriber" structure.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
equals	Request constraint	
multimediaRecord	Service = multimedia	
multimediaSubscriber	Category = multimediaSubscriber	
subscribedMultimedia Services	SEQUENCE OF	
registeredIdentifiers	SEQUENCE OF	
PartyIdentity	Party identity of the multimedia or telephony subscriber.	41771112233 sip:+41771112233@csp.ch tel:+41771112233
installationAddress	Structure composed of the installation address of the subscriber's equipment, if applicable.	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
iMSI	The International Mobile Subscriber Identity (IMSI) of the subscriber.	228993035511773F
iMEIs	SEQUENCE OF	

IMEI	International Mobile Equipment Identity	3571600455770210 359040082042280F
registeredICCIDs	SEQUENCE OF	
ICCIDInfo	SEQUENCE	
iCCID	Integrated Circuit Card ID of the subscriber (SIM)	89410228641400127777
eID	Identifier of the eUICC according to GSMA SGP.02 V4.3. (32 num.digits long)	321065498712345678907 41085296321
privateUserIdentities	SEQUENCE OF	
IMPI	Private User Identity (IMPI) associated with the party	228901234567890@ ims.mnc090.mcc228.3gppnetwork.org
allocatedDeviceIDs	SEQUENCE OF	
multimediaDeviceID	Unique identifier for this telephony device according to type of identifier	3568431553965701 *(IMEI)* or 54A6FA471B3C *(MAC)*
paymentTransactions	SEQUENCE OF	
MultimediaBillingRecords	Contains information for a particular paid service.	
method	Described the method of payment, such as a voucher.	voucher mobile voucher
multimediaTransactionID	The reference number of the voucher.	61167648018632
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com

8.4.2.4 IR_12_TEL response elements and structure for service information

This section covers the information response elements and fields of the multimedia subscriber records according to ETSI TS 102 657 V2.6.1 Annexes A and D.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
multimediaRecord	Service = multimedia	

multimediaSubscriber	Category = multimediaSubscriber	
subscriberID	Structure	
MultimediaSubscriberID	A unique identifier for this particular subscriber within the CSP.	123456789
subscribedMultimediaServices	SEQUENCE OF	
TimeSpan	Structure	
startTime	Start time of the service	20100225120000+0100 20100225120000Z
endTime	End time of the service, if applicable.	20160731120000+0200 20160731120000Z
registeredIdentifiers	SEQUENCE OF	
PartyIdentity	Representation of the same telephony or multimedia subscription party identity that can be delivered in different formats (e.g. MSISDN, SIP URI, TEL URI).	41771112233 sip:+41771112233@csp.ch tel:+41771112233
iMEIs	SEQUENCE OF	
IMEI	International Mobile Equipment Identity	3571600455770210 359040082042280F
multimediaServiceType	Indicates if it's a primary or secondary device in case of Multi-Device subscription. One record per device shall be delivered.	Primary Secondary
registeredICCIDs	SEQUENCE OF	
ICCIDInfo		
iCCID	Integrated Circuit Card ID of the subscriber (SIM)	89410228641400127777
timeSpan	Structure	
TimeSpan	SEQUENCE	
startTime	Start time of the subscribed service	20100611000000+0200 20100611000000Z
endTime	End time of the subscribed service	20160731000000+0200 20160731000000Z
pUK	PIN Unlock Key code linked to the subscriber's SIM card.	49682767
pUK2	PIN Unlock Key 2 code linked to the subscriber's SIM card.	87654321

iMSI	The International Mobile Subscriber Identity (IMSI) of the subscriber. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
eID	Identifier of the eUICC according to GSMA SGP.02 V4.3. (32 num.digits long)	321065498712345678907 41085296321
privateUserIdentities	SEQUENCE OF	
IMPI	Private User Identity (IMPI) associated with the party	228901234567890@ ims.mnc090.mcc228.3gppnetwork.org
allocatedDeviceIDs	SEQUENCE OF	
multimediaDeviceID	Unique identifier for this multimedia device according to type of identifier	3571600455770210 *(IMEI)* or 54A6FA471B3C *(MAC)*

8.4.3 Message services information requests and responses

The encoding and formats of the parameters for the network access information requests and responses relate to ETSI TS 102 657 V2.6.1 Annexes A and C.

8.4.3.1 IR_13_EMAIL & IR_14_EMAIL_FLEX request criteria elements and structure for subscription information

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the message subscription information. It uses the "msgSubscriber" structure.

Message Subscriber		
Element or attribute	**Description**	**Example**
equals	Request constraint	
messageRecord	Service = message	
msgSubscriber	Category = msgSubscriber	
MsgSubscriber	SEQUENCE	
subscriberID	Structure	
MsgSubscriberID	Unique identifier for this subscriber, e.g. account number	123456789
msgStores	SEQUENCE OF	
MsgStoreID	A unique identifier for message stores. This could be a mailbox name, or any other identification used by the CSP's message server. NOTE: Unlike in ETSI TS 102 657 V2.6.1 this element is specified as a “string”.	joe.muster@cspdomain.ch
msgStoreSubscriberRelatedIDs	SEQUENCE OF	
ContactDetails	SEQUENCE	
emailAddress	Further addressing elements linked to the service. e.g., email	hans.muster@foobar.ch
contactNumber	SEQUENCE OF	
PartyNumber	Further addressing elements linked to the service. e.g., phone number	41771112233
subscriber	Structure	
GenericSubscriberInfo	SEQUENCE	
OrganizationInfo	SEQUENCE	
name	Name of the organisation (corporate, foundation, etc...)	FOOBAR AG
contactDetails	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12

streetName	Street name	Mittelstrasse
poBox	Postal Box number	5578
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
nationalRegistrationID	Unique reference for this organisation as in the Swiss UID Register (uid.admin.ch) or the LEI (lei.admin.ch)	CHE-777.888.999
IndividualInfo	SEQUENCE	
PersonName	SEQUENCE	
surname	First the surname(s) and then the firstname(s). Without prefixes (e.g. Dr., Me.) and suffixes (e.g. Junior, Senior, Second, Third)	Muster Da Silva Joe Von der Heide Peter Hans De Pourtalès Léon Liu Jianguo Al-Shammari Fahd Abdul
contactAddress	SEQUENCE	
address	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	6897
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
dateOfBirth	subscriber's date of birth. Only the year, month and day information shall be taken into account. Any other indication shall be discarded.	19920611000000Z
AuthenticationInfo	SEQUENCE	
authenticationType	Description of the type of document used to authenticate, e.g. passport, ID card	ID card Passport
authenticationNumber	The number of the document used to authenticate	E12345678

8.4.3.2 IR_13_EMAIL & IR_14_EMAIL_FLEX response elements and structure for subscription information elements and structure

This section covers the information response elements and fields of the message subscription information records according to ETSI TS 102 657 V2.6.1 Annexes A and C.

Message Subscriber		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...

recordPayload structure		
messageRecord	Service = message	
msgSubscriber	Category = msgSubscriber	
MsgSubscriber	SEQUENCE	
subscriberID	Structure	
MsgSubscriberID	Unique identifier for this subscriber, e.g. account number	123456789
msgStores	SEQUENCE OF	
MsgStore	SEQUENCE	
validity	Structure	
TimeSpan	SEQUENCE	
startTime	Start time of the service	20100225120000+0200 20100225120000Z
endTime	End time of the service, if applicable.	20160731120000+0200 20160731120000Z
msgStoreID	Structure	
MsgStoreID	A unique identifier for message stores. This could be a mailbox name, or any other identification used by the CSP's message server. NOTE: Unlike in ETSI TS 102 657 V2.6.1 this element is specified as a “string”.	joe.muster@cspdomain.ch
aliases	SEQUENCE OF	
MsgAddress	Messaging addresses to which messages can be sent as alias. In the case of Internet e-mail this shall be an RFC2822-style address.	joe.muster@cspdomain.ch
providerID	Structure	
MsgProviderID	Unique identifier for the provider of the service. In form of the 5 digits allocated by the PTSS.	99989
msgForwardingAddresses	SEQUENCE OF	
MsgAddress	Messaging addresses to which messages can be forwarded-to. In the case of Internet e-mail this shall be an RFC2822-style address.	joe.muster@cspdomain.ch
msgStoreSubscriberRelatedIDs	SEQUENCE OF	
ContactDetails	SEQUENCE	
emailAddress	Further addressing elements linked to the service. e.g., email	hans.muster@foobar.ch
contactNumber	SEQUENCE OF	

PartyNumber	Further addressing elements linked to the service. e.g., phone number	41771112233
subscriber	Structure	
GenericSubscriberInfo	SEQUENCE	
OrganizationInfo	SEQUENCE	
name	Name of the organisation (corporate, foundation, etc...)	FOOBAR AG
contactDetails	SEQUENCE	
registeredAddress	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	5578
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1	CH
emailAddress	Email address of the contact person or the responsible unit in the organisation	hans.muster@foobar.ch ict.servicedsek@foobar.ch
contactNumber	SEQUENCE OF	
PartyNumber	Phone number(s) of the organisation	41771112233
nationalRegistrationID	Unique reference for this organisation as in the Swiss UID Register (uid.admin.ch) or the LEI (lei.admin.ch)	CHE-777.888.999
otherAddresses	SEQUENCE OF	
OtherAddress	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
relatedPersonName	SEQUENCE	
surname	Name of the individual that signed the contract on behalf of the organisation	Hans Muster
IndividualInfo	SEQUENCE	
PersonName	SEQUENCE	
surname	The surname(s) and firstname(s), as well as the prefixes and suffixes if applicable, are provided in this field only.	Muster Da Silva Joe
contactAddress	SEQUENCE	
address	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse

poBox	Postal Box number	6897
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1	CH
emailAddress	Email address of the subscriber	joe.muster@cspdomain.ch
contactNumber	SEQUENCE OF	
PartyNumber	Phone number(s) of the subscriber	41319998877
dateOfBirth	subscriber's date of birth. Only the year, month and day information shall be taken into account. Any other indication shall be discarded.	19920611000000Z
gender	ENUMERATED	male female other
AuthenticationInfo	SEQUENCE	
authenticationType	Description of the type of document used to authenticate, e.g. passport, ID card	ID card Passport
authenticationNumber	The number of the document used to authenticate	E12345678
profession	Profession of the subscriber, if available.	Consultant

8.4.4 Communication services information requests and responses

The encoding and formats of the parameters for the communication services information requests and responses relate to ETSI TS 102 657 V2.6.1 Annexes A and E.

8.4.4.1 IR_15_COM & IR_16_COM_FLEX request criteria elements and structure for subscription information

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the communication service subscription information.

network access Subscriber		
Element or attribute	**Description**	**Example**
equals	Request constraint	
networkAccess	Service = networkAccess	
naSubscriber	Category = naSubscriber	
subscriberID	A unique identifier for this particular subscriber within the CSP.	123456789

naSubscriptions structure		
NAServiceSubscription	SEQUENCE	
naServiceID	Identifier for the service.	SecureCom
naAuthID	Identifier linked to the communication service, e.g., logon or username.	p.muster@example.com
otherAddresses	SEQUENCE OF	
OtherAddress	SEQUENCE	
addressComments	List of other addressing elements registered in relation to this service, e.g., MSISDN, e-mail-address for contact or authentication etc.	john@doe.com
allocatedDevices	SEQUENCE OF	
NADevice	SEQUENCE	
subscriberID	One or more identifiers for this subscription, e.g., logon name	Joe123456
subscriber structure		
GenericSubscriberInfo	SEQUENCE	
OrganizationInfo	SEQUENCE	
name	Name of the organisation (corporate, foundation, etc...)	FOOBAR AG
contactDetails	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	5578
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
nationalRegistrationID	Unique reference for this organisation as in the Swiss UID Register (uid.admin.ch) or the LEI (lei.admin.ch)	CHE-777.888.999
IndividualInfo	SEQUENCE	
PersonName	SEQUENCE	
surname	First the surname(s) and then the firstname(s). Without prefixes (e.g. Dr., Me.) and suffixes (e.g. Junior, Senior, Second, Third)	Muster Da Silva Joe Von der Heide Peter Hans De Pourtalès Léon Liu Jianguo Al-Shammari Fahd Abdul
contactAddress	SEQUENCE	
address	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	6897
postalCode	Postal code of the city	9999
city	City	Ortdorf

country	Country code as defined in ISO 3166-1 (2013)	CH
dateOfBirth	Subscriber's date of birth. Only the year, month and day information shall be taken into account. Any other indication shall be discarded.	19920611000000Z
AuthenticationInfo	SEQUENCE	
authenticationType	Description of the type of document used to authenticate, e.g. passport, ID card.	ID card Passport
authenticationNumber	The number of the document used to authenticate	E12345678

8.4.4.2 IR_15_COM & IR_16_COM_FLEX response elements and structure for subscription information

This section covers the information response elements and fields of the communication service subscriber records according to ETSI TS 102 657 V2.6.1 Annexes A and E.

network access Subscriber		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
networkAccess	Service = networkAccess	
naSubscriber	Category = naSubscriber	
subscriberID	A unique identifier for this particular subscriber within the CSP.	123456789
naSubscriptions structure		
naSubscriptions	SEQUENCE OF	
NAServiceSubscription	SEQUENCE	
validity	Structure	
TimeSpan	SEQUENCE	
startTime	Start time of the subscribed service	20100611000000+0200 20100611000000Z
endTime	End time of the subscribed service	20160731000000+0200 20160731000000Z
naServiceID	Identifier for the service according to the CSP.	SecureCom
naServiceStatus	Information about the status of the subscribed service.	active ceased suspended
otherAddresses	SEQUENCE OF	
OtherAddress	SEQUENCE	
addressComments	List of other addressing elements registered in relation to this service, e.g., MSISDN, e-mail-address for contact or authentication etc.	john@doe.com
allocatedDevices	SEQUENCE OF	

NADevice	SEQUENCE	
subscriberID	One or more identifiers for this subscription, e.g., logon name	Joe123456 @Johndoe
subscriber structure		
GenericSubscriberInfo	SEQUENCE	
OrganizationInfo	SEQUENCE	
name	Name of the organisation (corporate, foundation, etc...)	FOOBAR AG
contactDetails	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	5578
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
emailAddress	Email address of the organisation	info@foobar.ch
contactNumber	SEQUENCE OF	
PartyNumber	Phone number(s) of the organisation	41771112233
nationalRegistrationID	Unique reference for this organisation as in the Swiss UID Register (uid.admin.ch) or the LEI (lei.admin.ch)	CHE-777.888.999
otherAddresses	SEQUENCE OF	
OtherAddress	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
relatedPersonName	SEQUENCE	
surname	Name of the individual that signed the contract on behalf of the organisation	Hans Muster
IndividualInfo	SEQUENCE	
PersonName	SEQUENCE	
surname	The surname(s) and firstname(s), as well as the prefixes and suffixes if applicable, are provided in this field only.	Muster Da Silva Joe
contactAddress	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	5578
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
emailAddress	Email address of the organisation	joe.muster@cspdomain.ch
contactNumber	SEQUENCE OF	

PartyNumber	Phone number(s) of the subscriber	41319998877
dateOfBirth	Subscriber's date of birth. Only the year, month and day information shall be taken into account. Any other indication shall be discarded.	19920611000000Z
gender	ENUMERATED	male female other
AuthenticationInfo	SEQUENCE	
authenticationType	Description of the type of document used to authenticate, e.g. passport, ID card.	ID card Passport
authenticationNumber	The number of the document used to authenticate	E12345678
profession	Profession of the subscriber, if available.	Consultant

8.4.5 Payment details information requests and responses

The encoding and formats of the parameters for the payment details information requests and responses relate to ETSI TS 102 657 V2.6.1 Annexes A and D and E.

8.4.5.1 IR_17_PAY request criteria elements and structure for payment details

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the payment details information for all services according to ETSI TS 102 657 V2.6.1 Annexes A and D.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
equals	Request constraint	
multimediaRecord	Service = multimedia	
multimediaSubscriber	Category = multimediaSubscriber	
subscriberID	Structure	
MultimediaSubscriberID	A unique identifier for this particular subscriber within the CSP.	123456789
subscribedMultimedia Services	SEQUENCE OF	
registeredIdentifiers	SEQUENCE OF	
PartyIdentity	Party identity of the multimedia or telephony subscriber.	41771112233 sip:+41771112233@csp.ch tel:+41771112233
paymentDetails	SEQUENCE	
bankAccount	SEQUENCE	

iBAN	International Bank Account Number according to ISO 13616 (2007)	CH5800242272380848402
nationalAccountNumber	National bank account number, if applicable.	2272380848402
nationalBankNumber	To be used in case that the account holding bank has neither IBAN nor BIC.	3808
billingAddress	Structure	
contactDetails	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	5578
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
billingIdentifier	Identifier used by the CSP to bill, resp. invoice, the subscriber of the service.	
paymentTransactions	SEQUENCE OF	
MultimediaBillingRecords	Contains information for a particular paid service.	
method	Described the method of payment, such as a voucher, refill card or credit card.	voucher refill card credit card
multimediaTransactionID	The reference numberof the voucher, refill card or credit card.	61167648018632

8.4.5.2 IR_17_PAY response elements and structure for payment details

This section covers the information response elements and fields of the payment details information for all services according to ETSI TS 102 657 V2.6.1 Annexes A and D.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
multimediaRecord	Service = multimedia	
multimediaSubscriber	Category = multimediaSubscriber	
subscriberID	Structure	
MultimediaSubscriberID	A unique identifier for this particular subscriber within the CSP.	123456789
subscribedMultimedia Services	SEQUENCE OF	

registeredIdentifiers	SEQUENCE OF	
PartyIdentity	Party identity or identities of the multimedia or telephony subscriber.	41771112233 sip:+41771112233@csp.ch tel:+41771112233 sip:+ 41992305887@csp.ch tel:+41992305887
paymentDetails	SEQUENCE	
billingMethod	ENUMERATED	debit transfer prepaid
bankAccount	SEQUENCE	
iBAN	International Bank Account Number according to ISO 13616 (2007)	CH5800242272380848402
bIC	Bank Identifier Code with format as per ISO 9362:2009	CTBACH2S
accountHolder	Bank account holder name	Joe Muster Da Silva
nationalAccountNumber	National bank account number, if applicable.	2272380848402
nationalBankNumber	To be used in case that the account holding bank has neither IBAN nor BIC.	3808
bankName	Name of the bank	First Bank
billingAddress	Structure	
contactDetails	SEQUENCE	
address	structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	12
streetName	Street name	Mittelstrasse
poBox	Postal Box number	5578
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
validity	Structure	
TimeSpan	SEQUENCE	
startTime	Start time of the billing address validity.	20160501000000+0200 20160501000000Z
endTime	End time of the billing address validity, if applicable.	20160731000000+0200 20160731000000Z
billingIdentifier	Identifier used by the CSP to bill, resp. invoice, the subscriber of the service.	

8.4.6 Identity document copy information requests and responses

8.4.6.1 IR_18_ID request criteria elements and structure for identity document copy

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the identity document copy for all services.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
equals	Request constraint	
multimediaRecord	Service = multimedia	
multimediaSubscriber	Category = multimediaSubscriber	
subscriberID	Structure	
MultimediaSubscriberID	A unique identifier for this particular subscriber within the CSP.	123456789
subscribedMultimedia Services	SEQUENCE OF	
registeredIdentifier	SEQUENCE OF	
PartyIdentity	Party identity of the multimedia or telephony subscriber.	41771112233 sip:+41771112233@csp.ch tel:+41771112233
iMSI	The International Mobile Subscriber Identity (IMSI) of the subscriber. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
iMEIs	SEQUENCE OF	
IMEI	International Mobile Equipment Identity	3571600455770210 359040082042280F
registeredICCIDs	SEQUENCE OF	
ICCIDInfo	SEQUENCE	
iCCID	Integrated Circuit Card ID of the subscriber (SIM)	89410228641400127777
eID	Identifier of the eUICC according to GSMA SGP.02 V4.3. (32 num.digits long)	321065498712345678907 41085296321
allocatedDeviceIDs	SEQUENCE OF	
MultimediaDeviceID	A unique identifier for the multimedia device e.g. MAC address or other. NOTE: Unlike in ETSI TS 102 657 V2.6.1 this element is specified as a “string”.	SOM876352 54A6FA471B3C
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	

PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com

8.4.6.2 IR_18_ID response elements and structure for identity document copy

This section covers the information response elements and fields of the identity document copy information. There are two methods to deliver this information.

Method 1: The electronic format identity document copy can be uploaded via the Graphical User Interface (GUI) of the Information Request Component (IRC) application provided by the PTSS.

Method 2: The electronic format identity document copy can be delivered via the HI-B interface for all services according to ETSI TS 102 657 V2.6.1 Annexes A and D. Prior to its implementation, this method 2 must be determined by the PTSS based on consultations with the CSP.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
multimediaRecord	Service = multimedia	
multimediaSubscriber	Category = multimediaSubscriber	
genericSubscriberInfo	Structure	
individualInfo	Structure	
authenticationInfo	Structure	
authenticationDocument	SEQUENCE OF	
File	Structure	
mediaType	Media type of the file according to IANA assignments.	image/jpeg image/png application/pdf
content	Content of file in OCTET STRING	

8.4.7 Billing document copy requests and responses

8.4.7.1 IR_19_BILL request criteria elements and structure for billing document copy

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the billing document copy for all services.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**

equals	Request constraint	
multimediaRecord	Service = multimedia	
MultimediaSubscriber	Category = MultimediaSubscriber	
subscriberID		
MultimediaSubscriberID	A unique identifier for this particular subscriber within the CSP.	123456789
subscribedMultimedia Services	SEQUENCE OF	
registeredIdentifiers	SEQUENCE OF	
PartyIdentity	Party identity of the multimedia or telephony subscriber.	41771112233 sip:+41771112233@csp.ch tel:+41771112233
iMSI	The International Mobile Subscriber Identity (IMSI) of the subscriber. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
paymentDetails	Structure	
billingIdentifier	Identifier used by the CSP to bill, resp. invoice, the subscriber of the service.	
iMEIs	SEQUENCE OF	
IMEI	International Mobile Equipment Identity	3571600455770051 359040082042280F
allocatedDeviceIDs	SEQUENCE OF	
MultimediaDeviceID	A unique identifier for the multimedia device e.g. MAC addresse or other. NOTE: Unlike in ETSI TS 102 657 V2.6.1 this element is specified as a “string”.	SOM876352 54A6FA471B3C
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription.	41771112233

nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com

8.4.7.2 IR_19_BILL response elements and structure for billing document copy information elements and structure

This section covers the information response elements and fields of the billing document copy information. There are two methods to deliver this information.

Method 1: The electronic format billing document copy can be uploaded via the Graphical User Interface (GUI) of the Information Request Component (IRC) application provided by the PTSS.

Method 2: The electronic format of the billing document copy information can be delivered via the HI-B interface for all services according to ETSI TS 102 657 V2.6.1 Annexes A and D. Prior to its implementation, this method 2 must be determined by the PTSS based on consultations with the CSP.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
multimediaRecord	Service = multimedia	
multimediaBillingDetails	Category = multimediaSubscriber	
MultimediaBillingDetails		
billingRecords	SEQUENCE OF	
MultimediaBillingRecords	SEQUENCE	
copyOfBill (NOTE)	SEQUENCE OF	
File	Structure	
mediaType	Media type of the file according to IANA assignments.	image/jpeg image/png application/pdf
content	Content of file in hexBinary	

NOTE: From ETSI TS 102 657 V2.6.1 and RDMessage33.xsd the element copyOfBill has been moved to the MultimediaBillingRecords sequence. CSP using a former version of the RDMessage may continue to deliver the element copyOfBill in the MultimediaBillingDetails sequence.

8.4.8 Contract document copy information requests and responses

8.4.8.1 IR_20_CONTRACT request criteria elements and structure for contract document copy

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the contract document copy for all services.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
Equals	Request constraint	

multimediaRecord	Service = multimedia	
multimediaSubscriber	Category = multimediaSubscriber	
subscriberID	Structure	
MultimediaSubscriberID	A unique identifier for this particular subscriber within the CSP.	123456789
subscribedMultimediaServices	SEQUENCE OF	
registeredIdentifier	SEQUENCE OF	
PartyIdentity	Party identity of the multimedia or telephony subscriber.	41771112233 sip:+41771112233@csp.ch tel:+41771112233
iMSI	The International Mobile Subscriber Identity (IMSI) of the subscriber. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
iMEIs	SEQUENCE OF	
IMEI	International Mobile Equipment Identity	3571600455770210 359040082042280F
registeredICCIDs	SEQUENCE OF	
ICCIDInfo	SEQUENCE	
iCCID	Integrated Circuit Card ID of the subscriber (SIM)	89410228641400127777
eID	Identifier of the eUICC according to GSMA SGP.02 V4.3. (32 num.digits long)	321065498712345678907 41085296321
allocatedDeviceIDs	SEQUENCE OF	
MultimediaDeviceID	A unique identifier for the multimedia device e.g. MAC address or other. NOTE: Unlike in ETSI TS 102 657 V2.6.1 this element is specified as a “string”.	SOM876352 54A6FA471B3C
sUPI	CHOICE	
iMSI	SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
nAI	SUPI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com
gPSI	CHOICE	
mSISDN	GPSI in the form of a MSISDN	
PartyNumber	Mobile Station International ISDN Numbers (MSISDNs)	41771112233

	allocated to this 5G subscription.	
nAI	GPSI in the form of a Network Access Identifier according to IETF RFC 4282.	joe@example.com

8.4.8.2 IR_20_CONTRACT response elements and structure for contract document copy

This section covers the information response elements and fields of the electronic format contract document copy information. There are two methods to deliver this information.

Method 1: The electronic format contract document copy can be uploaded via the Graphical User Interface (GUI) of the Information Request Component (IRC) application provided by the PTSS.

Method 2: The electronic format contract document copy information can be delivered via the HI-B interface for all services according to ETSI TS 102 657 V2.6.1 Annexes A and D. Prior to its implementation, this method 2 must be determined by the PTSS based on consultations with the CSP.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
multimediaRecord	Service = multimedia	
multimediaSubscriber	Category = multimediaSubscriber	
genericSubscriberInfo	Structure	
contracts	Structure	
contractInformation	SEQUENCE OF	
contractDocuments	SEQUENCE OF	
File	Structure	
mediaType	Media type of the file according to IANA assignments.	image/jpeg image/png application/pdf
content	Content of file in OCTET STRING	

8.4.9 Technical information requests and responses

The encoding and formats of the parameters for the technical data information requests and responses relate to ETSI TS 102 657 V2.6.1 Annexes A and E.

8.4.9.1 IR_21_TECH request criteria elements and structure for mobile and WLAN network access information

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the mobile and WLAN network access information.

network access		
Element or attribute	**Description**	**Example**
equals	Request constraint	
networkAccess	Service = networkAccess	
naNetworkElement	Category = NANwElement	
NANwElement Structure		
naNwElementID	CSP-defined label or name assigned to the observed network element, for instance a WLAN hotspot name or an access point.	AirportZRH01-CH
location	SEQUENCE	
globalCellID	Cell Global Identity used for GERAN and UTRAN according to 3GPP TS 23.003 V18.7.0. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets)	22F8901D50BB59
gsmLocation	CHOICE	
geoCoordinates	SEQUENCE	
latitude	Geographic coordinate that specifies the north–south position of a point on the Earth's surface according to the World Geodetic System 1984.	N465648.10
longitude	Geographic coordinate that specifies the east-west position of a point on the Earth's surface according to the World Geodetic System 1984.	E0072650.80
mapDatum	World Geodetic System indication of the coordinates	wGS84
eCGI	E-UTRAN Cell Global Identifier used for E-UTRAN according to 3GPP TS 23.003 V18.7.0. First octet "07" represents the length in octets. MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0)	0722F890056C8720 *[in hexadecimal format]*
bSSID	The Basic Service Set Identification (BSSID) of the WLAN access point. Equivalent to the MAC address of the access point.	5A23A4CF572F
nCGI	The NR Cell Global Identity (NCGI) is composed of the PLMN Identifier (pLMNID) and the NR Cell Identity (nRcellID) as shown in 3GPP TS 23.003 V18.7.0 clause 19.6A	
pLMNID	Public Land Mobile Network Identifier MCC(2 octets)+MNC(1 octet)	22F899

nRcellID	NR Cell Identity (encoded with 36 bits, 5 octets with most significant semi-octet as spare = 0)	0AB12CD34E

8.4.9.2 IR_21_TECH response elements and structure for mobile and WLAN network access information

This section covers the information response elements and fields of the mobile and WLAN network access according to ETSI TS 102 657 V2.6.1 Annexes A and E.

Network access		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
networkAccess	Service = networkAccess	
naNetworkElement	Category = NANwElement	
NANwElement Structure		
validity	Time period during which the information given in the record is or was valid.	
TimeSpan		
startTime	GeneralizedTime	20190321060000+0100
endTime	GeneralizedTime	20200612183000+0200
naNwElementID	CSP-defined label or name assigned to the observed network element, for instance a WLAN hotspot name or an access point.	AirportZRH01-CH
location	SEQUENCE	
globalCellID	Cell Global Identity used for GERAN and UTRAN according to 3GPP TS 23.003 V18.7.0. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets)	22F8901D50BB59 *[in hexadecimal format]*
rAI	Routing Area Identifier according to 3GPP TS 23.003 V18.7.0 MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+RAC (1 octet)	22F890FEDC43 *[in hexadecimal format]*
gsmLocation	CHOICE	
geoCoordinates	SEQUENCE	
latitude	Geographic coordinates that specifies the north–south position of a point on the Earth's surface according to the World Geodetic System 1984.	N465648.10
longitude	Geographic coordinates that specifies the east-west position of a point on the Earth's surface according to the World Geodetic System 1984.	E0072650.80
mapDatum	World Geodetic System indication of the coordinates	wGS84

azimuth	The azimuth is the bearing, relative to true north	270
sAI	Serving Area Identifier according to 3GPP TS 23.003 V18.7.0 MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+SAC(2 octets)	22F89065425785 *[in hexadecimal format]*
postalLocation	Structure	
AddressInformation	SEQUENCE	
buildingNumber	Building number	28
streetName	Street name	Marktplatz
postalCode	Postal code of the city	9999
city	City	Ortdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
otherInformation	Site specific characteristics	Indoor
extendedLocation	CHOICE	NOTE 1
region	SEQUENCE	
cornerMarks	SEQUENCE OF	
Spot	CHOICE	
gsmLocation	CHOICE	
geoCoordinates	SEQUENCE	
latitude	Geographic coordinates that specifies the north–south position of a point on the Earth's surface according to the World Geodetic System 1984.	N465632.40
longitude	Geographic coordinates that specifies the east-west position of a point on the Earth's surface according to the World Geodetic System 1984.	E0072622.14
mapDatum	World Geodetic System indication of the coordinates	wGS84
azimuth	The azimuth is the bearing, relative to true north	120
Spot	CHOICE	
postalLocation	CHOICE	
AddressInformation	SEQUENCE	
buildingNumber	Building number	42
streetName	Street name	Hauptstrasse
postalCode	Postal code of the city	9998
city	City	Ueberdorf
country	Country code as defined in ISO 3166-1 (2013)	CH
NOTE 1: The use of the “extendedLocation” structure is dedicated to the delivery of the mobile 3GPP access location information to a cell composed of several antennas distributed in different geographical locations but sharing the same cell identity.		
tAI	Tracking Area Identifier used for E-UTRAN according to 3GPP TS 23.003 V18.7.0. First octet "05" represents the length in octets. MCC(2 octets)+MNC(1 octet)+TAC(2 octets)	0522F89035B7 *[in hexadecimal format]*

eCGI	E-UTRAN Cell Global Identifier used for E-UTRAN according to 3GPP TS 23.003 V18.7.0. First octet "07" represents the length in octets. MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0)	0722F890056C8720 *[in hexadecimal format]*
bSSID	The Basic Service Set Identification (BSSID) of the WLAN access point. Equivalent to the MAC address of the access point.	5A23A4CF572F
nCGI	The NR Cell Global Identity (NCGI) is composed of the PLMN Identifier (pLMNID) and the NR Cell Identity (nRcellID) as shown in 3GPP TS 23.003 V18.7.0 clause 19.6A	
pLMNID	Public Land Mobile Network Identifier MCC(2 octets)+MNC(1 octet)	22F899
nRcellID	NR Cell Identity (encoded with 36 bits, 5 octets with most significant semi-octet as spare = 0)	0AB12CD34E

8.4.10 Association of subscription based assigned identifiers for a specific multimedia service

The encoding and formats of the parameters concerning the association of subscription based assigned identifiers for multimedia services and responses relate to ETSI TS 102 657 V2.6.1 Annexes A and D.

8.4.10.1 IR_51_ASSOC_PERM request criteria elements and structure for subscription information for multimedia services

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the association of subscription based assigned identifiers for a specific telecommunications service.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
equals	Request constraint	
multimediaRecord	Service = multimedia	
multimediaSubscriber	Category = multimediaSubscriber	
subscribedMultimedia Services	SEQUENCE OF	
TimeSpan	Structure	

startTime	Date and time at which the association of the assigned identifiers is requested.	20100225120000+0100 20100225120000Z
registeredIdentifiers	SEQUENCE OF	
PartyIdentity	Party identity of the multimedia or telephony subscriber (IMPU or E.164 number).	41771112233 sip:+41771112233@csp.ch tel:+41771112233
privateUserIdentities	SEQUENCE OF	
IMPI	Private User Identity (IMPI) associated with the party	228901234567890@ ims.mnc090.mcc228.3gppnetwork.org

NOTE: The request shall contain only one assigned identifier, either an IMPU or an IMPI.

8.4.10.2 IR_51_ASSOC_PERM response elements and structure for subscription information for multimedia services

This section covers the information response elements and fields for the association of subscription based assigned identifiers for specific telecommunications service according to ETSI TS 102 657 V2.6.1 Annexes A and D.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
recordNumber	Structure	0, 1, 2, ...
recordPayload structure		
multimediaRecord	Service = multimedia	
multimediaSubscriber	Category = multimediaSubscriber	
subscribedMultimediaServices	SEQUENCE OF	
TimeSpan	Structure	
startTime	Start time of the association validity.	20100225120000+0100 20100225120000Z
endTime	End time of the association validity. Only if available.	20160731120000+0200 20160731120000Z
registeredIdentifiers	SEQUENCE OF	
PartyIdentity	Party identity or identities of the multimedia or telephony subscriber. (IMPU or E.164 number)	41771112233 sip:+41771112233@csp.ch tel:+41771112233 sip:+41992305887@csp.ch tel:+41992305887
privateUserIdentities	SEQUENCE OF	
IMPI	Private User Identity (IMPI) associated with the party.	228901234567890@ ims.mnc090.mcc228.3gppnetwork.org

8.4.11 Determination of the adjacent network identity for telephony and multimedia services

The encoding and formats of the parameters concerning the adjacent network identity for telephony and multimedia services requests and responses relate to ETSI TS 102 657 V2.6.1 Annexes A and D.

8.4.11.1 IR_53_TEL_ADJ_NET request criteria elements and structure for telephony and multimedia service usage information

This section covers the information request criteria contained in the requestParameters ⇨ RequestConstraints sequence sent in the XML request for the determination of the adjacent network.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
equals	Request constraint	
multimediaRecord	Service = multimedia	
multimediaServiceUsage	Category = multimediaServiceUsage	
MultimediaServiceUsage	SEQUENCE	
partyInformation	SEQUENCE OF	
MultimediaPartyInformation		
partyRole	Role of the parties pertaining to the call, session or message. Shall be used to qualify the role of the partyIdentity in the request.	calling called redirecting forwarded-to-Party smsOriginator smsRecipient
partyIdentity	SIP URI or TEL URI or E.164 number in international format.	sip:alice@atlanta.com tel:+41598889988 41598889988
communicationTime		
TimeSpan		
startTime	Date and time of the start of communication or attempted communication in “GeneralizedTime” format.	20210402121805Z
endTime	End time of the communication call or session in “GeneralizedTime” format. Only in case of answered calls or sessions.	20210402123156Z

8.4.11.2 IR_53_TEL_ADJ_NET response elements and structure for telephony and multimedia service usage information

This section covers the information response elements and fields for the determination of the adjacent network according to ETSI TS 102 657 V2.6.1 Annexes A and D.

Multimedia Subscriber		
Element or attribute	**Description**	**Example**
equals	Request constraint	
multimediaRecord	Service = multimedia	
multimediaServiceUsage	Category = multimediaServiceUsage	
MultimediaServiceUsage	SEQUENCE	
partyInformation	SEQUENCE OF	
MultimediaPartyInformation		
partyRole	Role of the parties pertaining to the call, session or message.	calling called redirecting forwarded-to-Party smsOriginator smsRecipient
communicationTime	Structure	
TimeSpan	SEQUENCE	
startTime	Date and time of the start of communication or attempted communication in “GeneralizedTime” format.	20210402121805Z
endTime	End time of the communication call or session in “GeneralizedTime” format. Only in case of answered calls or sessions.	20210402123156Z
trunkGroupIDs	SEQUENCE	
incomingTrunkGroupID	Identity of the incoming PSTN leg. Format as defined by the CSP.	TGISWE01 FRA332 21804
outgoingTrunkGroupID	Identity of the outgoing PSTN leg. Format as defined by the CSP.	TGISWE01 FRA332 21804
interOperatorIDs	SEQUENCE	
originatingInterOperatorID	Originating Inter Operator Identifier `orig-ioi` formated as defined in IETF RFC 7315 and 3GPP TS 32.260 V18.3.0	ims.mnc099.mcc228.3gppnetwork.org IMSSTB_32 Orange_FR
terminatingInterOperatorID	Terminating Inter Operator Identifier `term-ioi`, formated as defined in IETF RFC 7315 and 3GPP TS 32.260 V18.3.0	ims.mnc099.mcc228.3gppnetwork.org IMSSTB_32 Orange_FR
transitInterOperatorIDList	Transit Inter Operator Identifier `transit-ioi-list`, formated as defined in	Orange_FR.1 IMSSTB_32.1

	IETF RFC 7315 and 3GPP TS 32.260 V18.3.0	

8.4.12 Association of temporary to permanent 5G identifiers in real-time

8.4.12.1 IR_52_ASSOC_TEMP and LI_HIQR handover interface purpose

5G Standalone networks use temporary identities in place of permanent identities to ensure that identities which are visible on exposed interfaces (e.g. Radio Access Network) cannot be used to track or degrade the privacy of a subscriber. For LI purposes, CSPs are required to be able to provide real-time association between temporary and permanent identities where the use of such identity associations impact the ability of the LEA to identify unambiguously the UE, subscriber or true permanent identities associated with a service.

The general concept and description of the functional entities and interfaces to perform the identity association are specified in ETSI TS 133 127 V18.12.0 clause 5.7.

The architecture and the functions and interfaces are described in the figure below:

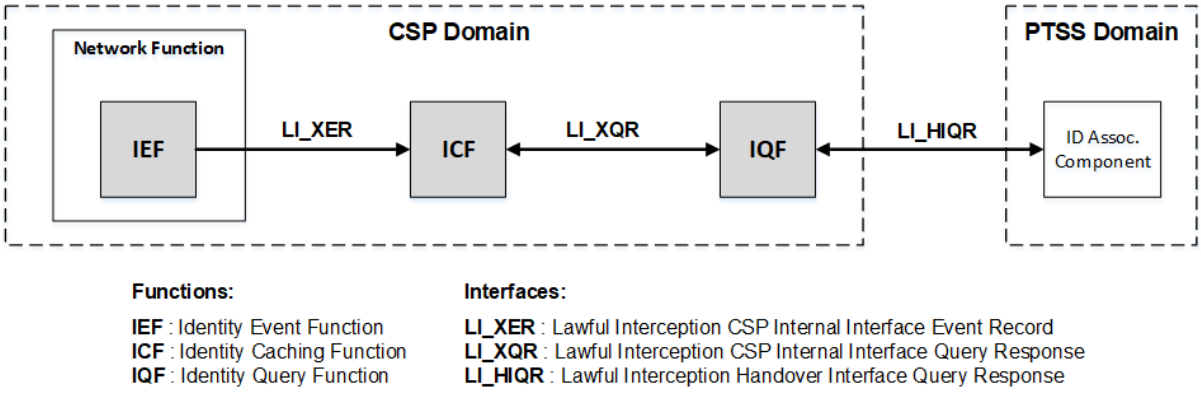

Figure 8-1: Functions and interfaces architecture for identifier association query and response

8.4.12.2 LI_HIQR handover interface description and overview

The LI_HIQR interface uses most of the building blocks of the specification ETSI TS 103 120 V1.9.1 such as the LDTaskObject and DeliveryObject with the corresponding XML messages and the transport network. It also uses the ETSI TS 103 280 V2.16.1 common parameters and the dictionaries, queries and records formats specified in ETSI TS 133 128 V18.12.0 clause 5.7.

8.4.12.2.1 LI_HIQR Transport security

Implementations shall support HTTPS as defined in IETF RFC 2818, including the support for mutual authentication through bidirectional certificate usage according to ETSI TS 103 120 V1.9.1 clause 9.3.4.
The exchange of the certificates and security requirements (such as key management, key length and the choice of cryptographic algorithm) is an implementation issue and shall be determined by the PTSS based on consultations with the CSP.

8.4.12.2.2 Action messages used for the LI_HIQR query and response

Action and Action Responses messages specified for the LI_HIQR interface used by the query and response procedure according to ETSI TS 103 120 V1.9.1 clauses 6.4.2 and 6.4.3 are:

Action Requests	Action Responses
CREATE	CREATE RESPONSE
DELIVER	DELIVER RESPONSE
	ERROR INFORMATION

Table 8-7: Action messages used by the LI_HIQR interface

8.4.12.2.3 Message flow for LI_HIQR query and response

This section provides an overview of the message flow for a real-time identity association query and response.

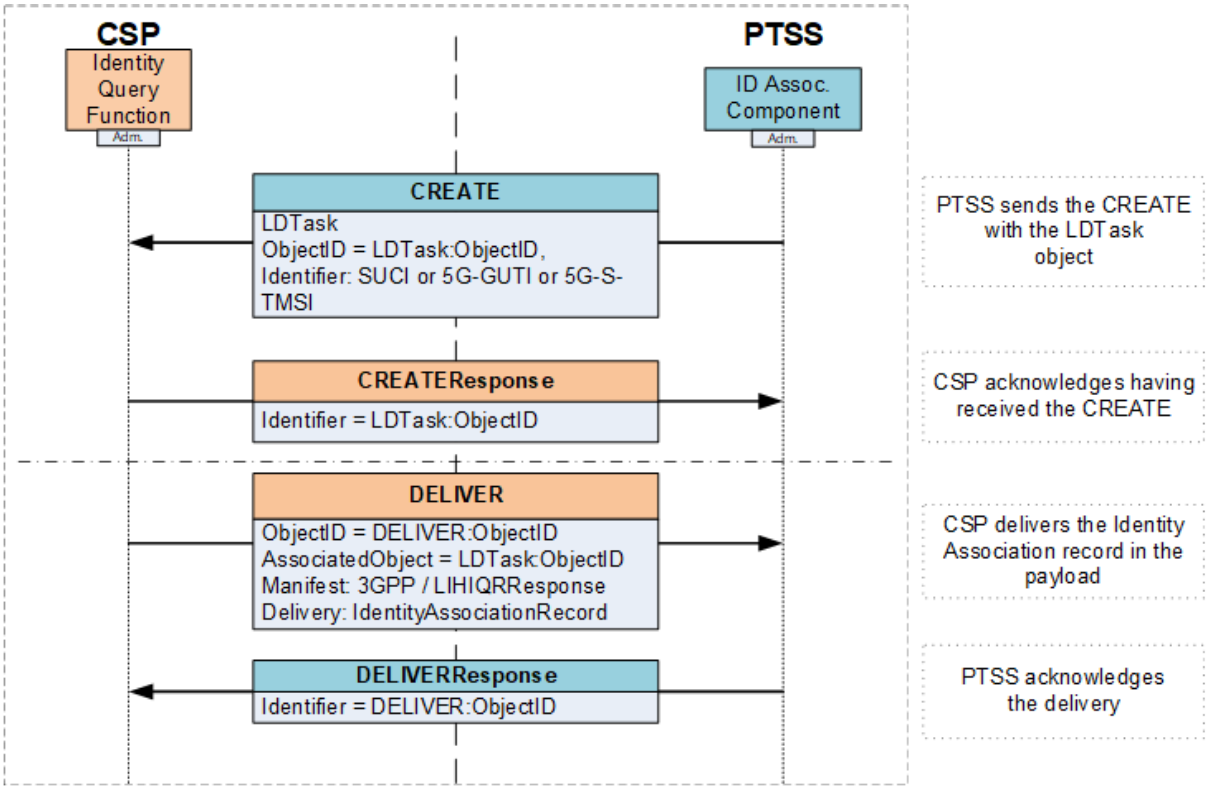

Figure 8-2: Message flow for a real-time identity association query and response

8.4.12.2.4 Message flow in case of error or invalidity for LI_HIQR query and response

This section provides an overview of the message flow in case of error or invalidity for a real-time identity association query and response. When the query is not correctly formed or when a value in the request is not valid or when the CSP system experiences a problem in its internal system. Refer to ETSI TS 103 120 V1.9.1 clause 6.4.9 for its application and to Annex D for error codes and descriptions.

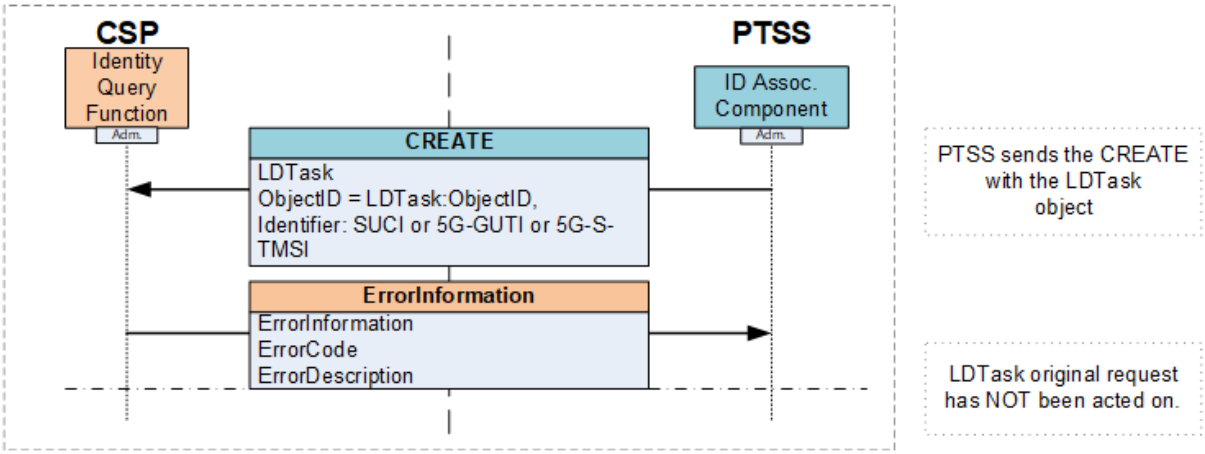

Figure 8-3: Message flow in case of error for a real-time identity association query and response

8.4.12.3 ETSI TS 103 120 V1.9.1 requirements and options for the LI_HIQR interface

The following ETSI TS 103 120 V1.9.1 requirements and options are valid for the realization of the LI_HIQR interface with the LDTask and DELIVER methods.

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
6.2 Messages header		
6.2.3	**NationalProfileOwner:**	PTSS
	NationalProfileVersion:	V3.0.0
6.2.4	**UniqueIdentifier:** Unique identifier sufficient for identifying the object/field within the country. LongString (see ETSI TS 103 280 V2.16.1)	Value PTSS for PTSS and the 5-digit code CSPID for CSPs. CSPID is a 5-digit code allocated by the PTSS to each CSP in Switzerland.
6.4 Action Request and Responses (request payload)		
6.4.6	**CREATE Request** (See Annex 1 section 8.4.12.4.1 for details and example values)	List of the HI1Object fields required in the CREATE Request Message: **HI1Object required fields:** ObjectIdentifier of the LDTask CountryCode OwnerIdentifier ExternalIdentifier **LDTask object required fields:** Reference DesiredStatus LDTaskDesiredStatus RequestDetails Type ObservedTime RequestValues DeliveryDetails LDDeliveryDestination CSPID Flags

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
	CREATE Response (See Annex 1 section 8.4.12.4.2 for details and example values)	List of the HI1Object fields required in the CREATE Response Messages: **HI1Object required fields:** ObjectIdentifier
6.4.9	**Action Unsuccessful Information** (See Annex 1 section 8.4.12.4.5 for details and example values)	**ErrorCode** and **ErrorInformation** shall match values of table D.1 “Detailed error codes” of ETSI TS 103 120 V1.9.1 Annex D.
6.4.10	**DELIVER** (See Annex 1 section 8.4.12.4.3 for details and example values)	List of the HI1Object fields required in the DELIVER Message: **HI1Object required fields:** Identifier HI1Object Type ObjectIdentifier AssociatedObject DeliveryObject (details in ETSI TS 103 120 V1.9.1 clause 10)
	DELIVER Response (See Annex 1 section 8.4.12.4.4 for details and example values)	List of the HI1Object fields required in the DELIVER Response Message: **HI1Object required fields:** ObjectIdentifier
7.1 HI1Object		
7.1.1	**ExternalIdentifier**	This field is used to correlate the tasking instructions for accounting purposes. It is composed of the first 14 digits of the LDTask: Reference LDID.
7.1.4	**AssociatedObjects**	The field **AssociatedObjects** contains a single **AssociatedObject** that is populated with the *ObjectIdentifier* of the associated LDTask object.
8.3 LDTaskObject		
8.3.4	**LDTaskDesiredStatus**	Dictionary Owner: **ETSI** Dictionary Name: **LDTaskDesiredStatus** Dictionary authorised value: **AwaitingDisclosure**: The Task is approved but is not yet processed by the LD system.

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
8.3.5	**RequestDetails:** **Type** (see ETSI TS 133 128 V18.12.0 Table 5.7.2-3) **ObservedTime:** **RequestValues**	 Dictionary Owner: **3GPP** Dictionary Name: **Request Type** Dictionary Value: **IdentityAssociation** QualifiedDateTime (ETSI TS 103 280 V2.16.1) Format Type Format Owner: **3GPP** Format Name: **ETSI TS 133 128 V18.12.0 Clause 5.7.2.2** and **Table 5.7.2-4.** NOTE 1: The NRCellIdentity and TrackingAreaCode shall be omitted in the request. NOTE 2: The LIHIQRFlags is not used in Switzerland and the NR Cell Global Identity and FiveGSTAIList shall not be delivered in the response.
8.3.6	**DeliveryDetails:** **DeliveryDestination**	 HandoverFormat Dictionary Owner: **ETSI** Dictionary Name: **LDHandoverformat** Dictionary authorised value: **TS103120** DeliveryProfile Dictionary Owner: **PTSS** Dictionary Name: **LDDeliveryProfile** Dictionary authorised values: **LI_HIQR_Production** **LI_HIQR_Intergation_1** **LI_HIQR_Integration_2**

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
8.3.7	**Flags**	There are two flags based on the following PTSS dictionaries: Dictionary Owner: **PTSS** Dictionary Name: **PTSSNationalRequestTypes** Dictionary authorised values: **IR_52_ASSOC_TEMP** Dictionary Owner: **PTSS** Dictionary Name: **LDTaskMode** Dictionary authorised values: **Normal** **TEST_PTE** **TEST_PTSA** **TEST_PTSE** **TEST_PTSTR** **TEST_PTSTE** **TEST_CTT** **TEST_ATT**
9.3.2	**Client/Server architecture**	On PTSS side the client uses the following timeout and retries configuration: Connection timeout: 10 seconds Read timeout: 30 seconds Retry policy: every 1 minute, 15 retries Final failure: Alert/requeue for manual processing.

Clause ETSI TS 103 120 V1.9.1	Available options for Swiss applications	Additional requirements or specifications
10.2	**DeliveryObject** **Reference**	LDID assigned by the corresponding LDTaskObject.
	DeliveryID	UUID uniquely assigned by the corresponding LDTaskObject.
	SequenceNumber	An incremental and unique number within the scope of a DeliveryID. Starts with 1.
	LastSequence	A boolean that indicates whether this was the last sequence for a DeliveryID. Shall be set to “true” if there is only one SequenceNumber.
	Manifest	It describes the format used in the delivery. The content shall be set to Dictionary owner: **3GPP** Dictionary name: **ManifestSpecification** Dictionary value: **LIHIQRResponse** ETSI TS 133 128 V18.12.0 Table 5.7.2-6
	Delivery	The Delivery structure to be provided is XML data in the LIHIQRResponse. The IdentityAssociationRecord shall be formatted according to ETSI TS 133 128 V18.12.0 Table 5.7.2-5.

8.4.12.4 Format and coding of LI_HIQR query and response

This section provides requirements and examples about the different elements composing the XML messages for the identity association simple process exchanged over the LI_HIQR interface between the PTSS and the CSP.

The collection of messages below aims to show an example of structure for each type of message.

8.4.12.4.1 LI_HIQR interface XML structure of a CREATE request for a LDTask

ETSI TS 103 120 V1.9.1		
Element or attribute	**Description**	**Example**
Header		
SenderIdentifer	CountryCode: ShortString / ISO 3166-1 Alpha-2 code UniqueIdentifer:	CH CH-PTSS_IRC_PROD
ReceiverIdentifer	CountryCode: ShortString / ISO 3166-1 Alpha-2 code	CH

	UniqueIdentifer: CSPID	99989
TransactionIdentifer	UUID: RFC 4122 in canonical form	1c8e57f1-71bf-432c-ad95-ebf85f23eddd
Timestamp	QualifiedMicrosecondDateTime	2025-10-23T09:07:54.931268Z
Version	ETSIVersion NationalProfileOwner NationalProfileVersion	V1.9.1 PTSS V3.0.0
Payload		
RequestPayload	Structure	
ActionRequests	Structure	
ActionRequest	Structure NOTE: After consultation and agreement with the CSP, PTSS may send multiple ActionRequest structures.	
ActionIdentifier	Generated by the sender	0
CREATE	Structure	
HI1Object		
ObejctType	type	LDTaskObject
ObjectIdentifier	UUID: RFC 4122 in canonical form	7673c768-5d06-45ce-9159-9dfda96b1dd3
CountryCode	CountryCode: ShortString / ISO 3166-1 Alpha-2 code	CH
OwnerIdentifier	ShortString	PTSS
ExternalIdentifier	LongString	20251023110754
LDTask		
Reference	LDID	CH-PTSS-20251023110754931061932000000
DesiredStatus	TaskDesiredStatus: ETSI dictionary entry	AwaitingDisclosure
RequestDetails	RequestType: 3GPP dictionary entry	IdentityAssociation
ObservedTime	QualifiedDateTime	2025-10-23T11:07:53+02:00
RequestValues	RequestValue and FormatType extensions according to ETSI TS 133 128 V18.12.0 Table 5.7.2-4 FormatOwner: 3GPP FormatName: SUCI or FormatOwner: 3GPP FormatName: 5GGUTI	 suci-0-228-99-1-0-0-b2e92f836055a255837de 5gguti-228-99-80-008-18-7f631030

	or FormatOwner: 3GPP FormatName: 5GSTMSI	 5gstmsi-a10-3b-20a5c540
DeliveryDetails	LDDeliveryDestination: ETSI dictionary entry: LDHandoverFormat PTSS dictionary entry: LDDeliveryProfile	 TS103120 LI_HIQR_Production
CSPID	CountryCode: ISO 3166-1 Alpha-2 code UniqueIdentifer	 CH 99989
Flags	PTSS dictionary entries: PTSSNationalRequestTypes LDTaskMode	 IR_52_ASSOC_TEMP Normal

8.4.12.4.2 LI_HIQR interface XML structure of a CREATE response for a LDTask

ETSI TS 103 120 V1.9.1		
Element or attribute	**Description**	**Example**
Header		
SenderIdentifer	CountryCode: ShortString / ISO 3166-1 Alpha-2 code UniqueIdentifer:	CH CH-PTSS_IRC_PROD
ReceiverIdentifer	CountryCode: ShortString / ISO 3166-1 Alpha-2 code UniqueIdentifer: CSPID	CH 99989
TransactionIdentifer	UUID: RFC 4122 in canonical form	1c8e57f1-71bf-432c-ad95-ebf85f23eddd
Timestamp	QualifiedMicrosecondDateTime	2025-10-23T09:07:55.172000Z
Version	ETSIVersion NationalProfileOwner NationalProfileVersion	V1.9.1 PTSS V3.0.0
Payload		
ResponsePayload	Structure	
ActionResponses	Structure	
ActionResponse	Structure	
ActionIdentifier	Generated by the sender	0
CREATEResponse	Structure	
Identifier		7673c768-5d06-45ce-9159-9dfda96b1dd3
HI1Object		

ObejctType	type	LDTaskObject
ObjectIdentifier	UUID: RFC 4122 in canonical form	7673c768-5d06-45ce-9159-9dfda96b1dd3

8.4.12.4.3 LI_HIQR interface XML structure of a DELIVER request for a LDTask

ETSI TS 103 120 V1.9.1		
Element or attribute	**Description**	**Example**
Header		
SenderIdentifer	CountryCode: ShortString / ISO 3166-1 Alpha-2 code UniqueIdentifer: CSPID	CH 99989
ReceiverIdentifer	CountryCode: ShortString / ISO 3166-1 Alpha-2 code UniqueIdentifer:	CH CH-PTSS_IRC_PROD
TransactionIdentifer	UUID: RFC 4122 in canonical form	210a5732-4dc8-4db8-85c3-5f459b1622cf
Timestamp	QualifiedMicrosecondDateTime	2025-10-23T09:07:55.225000Z
Version	ETSIVersion NationalProfileOwner NationalProfileVersion	V1.9.1 PTSS V3.0.0
Payload		
RequestPayload	Structure	
ActionRequests	Structure	
ActionRequest	Structure	
ActionIdentifier	Generated by the sender	0
DELIVER	Structure	
Identifier	UUID: RFC 4122 in canonical form	453afa35-e512-49fe-bb35-9774783c254b
HI1Object		
ObjectIdentifier	UUID: RFC 4122 in canonical form	453afa35-e512-49fe-bb35-9774783c254b
AssociatedObject	UUID: RFC 4122 in canonical form. Refers to the object of the CREATE LDTask.	7673c768-5d06-45ce-9159-9dfda96b1dd3
Reference	LDID	CH-PTSS-20251023110754931061932000000
DeliveryID	UUID uniquely assigned by the corresponding LDTaskObject.	10bebc23-a2f1-4276-b3b4-bc953593f2b3
SequenceNumber	An incremental and unique number within the scope of a DeliveryID. Starts with 1.	1

LastSequence	A boolean that indicates whether this was the last sequence for a DeliveryID.	true
Manifest	Format used in the delivery. The content shall be set to: Dictionary Owner: Dictionary Name: Dictionary Value:	 3GPP ManifestSpecification LIHIQRResponse
Delivery	Delivery structure is XML data for the LIHIQRResponse.	XMLData
LIHIQRResponse	The IdentityAssociationRecord shall be formatted according to ETSI TS 133 128 V18.12.0 Table 5.7.2-5.	LIHIQRResponse
Associations	Structure	
IdentityAssociationRecord	SUPI SUPIMSI	 228994936000666
	SUCI	suci-0-228-99-1-0-0-b2e92f836055a255837de
	FiveGGUTI	5gguti-228-99-80-043-39-E0047CB8
	PEI PEIIMEI or PEIIMEISV or PEIMAC	 35395803121326 3539580312132612 00:00:5e:00:53:12
	AssociationStartTime	2025-10-23T11:03:06.973000Z
	AssociationStopTime	2025-10-23T11:06:47.127000Z
	GPSI GPSIMSISDN	 41779998899

8.4.12.4.4 LI_HIQR interface XML structure of a DELIVER response for a LDTask

ETSI TS 103 120 V1.9.1		
Element or attribute	**Description**	**Example**
Header		
SenderIdentifer	CountryCode: ShortString / ISO 3166-1 Alpha-2 code UniqueIdentifer: CSPID	CH 99989
ReceiverIdentifer	CountryCode: ShortString / ISO 3166-1 Alpha-2 code UniqueIdentifer:	CH CH-PTSS_IRC_PROD
TransactionIdentifer	UUID: RFC 4122 in canonical form	210a5732-4dc8-4db8-85c3-5f459b1622cf

Timestamp	QualifiedMicrosecondDateTime	2025-10-23T09:07:55.409477Z
Version	ETSIVersion NationalProfileOwner NationalProfileVersion	V1.9.1 PTSS V3.0.0
Payload		
ResponsePayload	Structure	
ActionResponses	Structure	
ActionResponse	Structure	
ActionIdentifier	Generated by the sender	0
DELIVERResponse	Structure	
Identifier	UUID: RFC 4122 in canonical form	453afa35-e512-49fe-bb35-9774783c254b

8.4.12.4.5 LI_HIQR interface XML structure of an ErrorInformation response for a LDTask

ETSI TS 103 120 V1.9.1		
Element or attribute	**Description**	**Example**
Header		
SenderIdentifer	CountryCode: ShortString / ISO 3166-1 Alpha-2 code UniqueIdentifer:	CH CH-PTSS_IRC_PROD
ReceiverIdentifer	CountryCode: ShortString / ISO 3166-1 Alpha-2 code UniqueIdentifer: CSPID	CH 99989
TransactionIdentifer	UUID: RFC 4122 in canonical form	1c8e57f1-71bf-432c-ad95-ebf85f23eddd
Timestamp	QualifiedMicrosecondDateTime	2025-10-23T09:07:55.409477Z
Version	ETSIVersion NationalProfileOwner NationalProfileVersion	V1.9.1 PTSS V3.0.0
Payload		
ResponsePayload	Structure	
ErrorInformation		
ErrorCode	Integer code specifying the type of error according to ETSI TS 103 120 V1.9.1 Annex D.	3005
ErrorDescription	Detail of the error that occurred.	Required element missing

8.5 Handover interfaces requirements

8.5.1 ETSI TS 102 657 V2.6.1 Handover interface for the request and delivery of information requests

The handover interface is used for the transmission of the PTSS requests and CSP responses for Information Requests. The data is encoded in one or several XML files.

The requirements and options related to ETSI TS 102 657 V2.6.1 are specified in the present document in section 7.5.

8.5.2 ETSI TS 103 120 V1.9.1 LI_HIQR Handover interface for the query and response of the IR_52_ASSOC_TEMP information request

The LI_HIQR handover interface is used for the transmission of the PTSS queries and CSP responses for the specific Information Request IR_52_ASSOC_TEMP in real-time. The data is encoded in one or several XML files.

The requirements and options related to ETSI TS 103 120 V1.9.1 for the realization of the LI_HIQR are specified in the present document in section 8.4.12.3.

8.6 Applicable XML schema version for information requests

Any superior version can be adopted by the CSP for better performances. This must be agreed with the PTSS in order to ensure the compatibility with the current Information Request Component systems, and this requires a new compliance assessment.

Applicable XML Schema	Requirement or instruction for application
ETSI TS 102 657 V.2.6.1	
RDMessage XML Schema (xsd)	RDMessage33.xsd xmlns="http://uri.etsi.org/02657/v2.6.1#/RetainedData" The following changes are applicable in Switzerland to the ETSI published xsd: The elements “MsgSubscriberID”, “MsgStoreID”, “MultimediaBillingIdentifier”, “MultimediaDeviceID” are defined with a type “string” instead of “hexBinary”, as <xsd:simpleType name="**MsgSubscriberID**"> <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> <xsd:simpleType name="**MsgStoreID**"> <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> <xsd:simpleType name="**MultimediaBillingIdentifier**"> <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> <xsd:simpleType name="**MultimediaDeviceID**"> <xsd:restriction base="**xsd:string**"/> </xsd:simpleType>
ETSI TS 103 120 V1.9.1	
XML Schema (xsd)	ts_103120v010901p0_Common.xsd
	ts_103120v010901p0_Core.xsd
	ts_103120v010901p0_Delivery.xsd
	ts_103120v010901p0_Dictionaries.xsd
	ts_103120v010901p0_Task.xsd
	ts_103120v010901p0_Notification.xsd
XML file	ts_103120v010901p0_ETSIDictionaryDefinitions.xml
	_PTSS_DictionaryDefinitions V3.0.0.xml (NOTE 1)
ETSI TS 103 280 V2.16.1	
XML Schema (xsd)	ts_103280v020301p0.xsd or ts_103280v021301.xsd

Table 8-8: Applicable XML schema version for information requests

NOTE 1: The file “_PTSS_DictionaryDefinitions V3.0.0.xml” is issued by PTSS and can be provided upon request to the CSP.

9 Security

9.1 Data Protection

In order to ensure the confidentiality of data, the legal requirements of the Federal Act on Data Protection (FADP) “Bundesgesetz über den Datenschutz (DSG) vom 25. September 2020 (SR 235.1)” apply for the PTSS and the CSP.

9.2 Hardware Security

The CSP and the PTSS must ensure the prevention of unauthorised access to the functionality of all the systems involved in lawful interception.

10 List of Technical Specifications

This section provides a list of ETSI and 3GPP Technical Specifications (ETSI and 3GPP TS), IETF Request for Comments (RFC), ISO standards, ITU Recommendations, Broadband Forum report, GSM Association and Open Mobile Alliance documents used in this annex. It is meant to ease the reading and implementation of the handover interfaces specified in the present document.

ETSI TS 101 331 V1.8.1	Lawful Interception (LI); Requirements of Law Enforcement Agencies
ETSI TS 101 671 V3.12.1	Telecommunication security; Lawful interception (LI); Handover interface for the lawful interception of telecommunication traffic
ETSI TS 102 232-1 V3.34.1	Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 1: Handover specification for IP delivery
ETSI TS 102 232-2 V3.16.1	Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 2: Service-specific details for Email services
ETSI TS 102 232-3 V3.16.1	Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 3: Service-specific details for internet access services
ETSI TS 102 232-5 V3.21.1	Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 5: Service-specific details for IP Multimedia Services
ETSI TS 102 232-6 V3.5.1	Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 6: Service-specific details for PSTN/ISDN services
ETSI TS 102 232-7 V3.13.1	Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 7: Service-specific details for Mobile Services
ETSI TR 102 503 V1.19.1	Lawful Interception (LI); ASN.1 Object Identifiers in Lawful Interception and Retained data handling Specifications
ETSI TS 102 657 V2.6.1	Lawful Interception (LI); Retained data handling; Handover interface for the request and delivery of retained data
ETSI TS 103 221-1 V1.21.1	Lawful Interception (LI); Part 1: Internal Network Interface X1 for Lawful Interception
ETSI TS 103 221-2 V1.9.1	Lawful Interception (LI); Part 2: Internal Network Interface X2/X3 for Lawful Interception
ETSI TS 103 120 V1.9.1	Lawful Interception (LI); Interface for warrant information
ETSI TS 103 280 V2.16.1	Lawful Interception (LI); Dictionary for common parameters
ETSI TS 132 298 V18.9.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; Charging Data Record (CDR) parameter description
ETSI TS 133 106 V18.0.0	Universal Mobile Telecommunications System (UMTS); LTE; 3G security; Lawful interception requirements

ETSI TS 133 107 V18.0.0	Universal Mobile Telecommunications System (UMTS); LTE; 3G security; Lawful interception architecture and functions
ETSI TS 133 108 V18.0.0	Universal Mobile Telecommunications System (UMTS); LTE;3G security; Handover interface for Lawful Interception (LI)
ETSI TS 133 126 V18.2.0	Technical Specification Group Services and System Aspects; Security; Lawful Interception requirements
ETSI TS 133 127 V18.12.0	Technical Specification Group Services and System Aspects; 5G Security; Lawful Interception (LI) architecture and functions
ETSI TS 133 128 V18.12.0	Technical Specification Group Services and System Aspects; 5G Security; Protocol and procedures for Lawful Interception (LI); Stage 3
ETSI TS 129 002 V18.0.0	Universal Mobile Telecommunications System (UMTS); Mobile Application Part (MAP) specification
ETSI TS 123 228 V18.10.0	IP Multimedia Subsystem (IMS); Stage 2
ETSI TS 124 229 V18.8.0	IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3
3GPP TS 23.003 V18.7.0	Universal Mobile Telecommunications System (UMTS); Numbering, addressing and identification
3GPP TS 23.008 V18.1.0	Technical Specification Group Core Network and Terminals; Organization of subscriber data;
3GPP TS 23.032 V18.3.0	Universal Mobile Telecommunications System (UMTS); Universal Geographical Area Description (GAD)
3GPP TS 23.040 V18.0.0	Technical Specification Group Core Network and Terminals; Technical realization of the Short Message Service (SMS)
3GPP TS 23.060 V18.0.0	Universal Mobile Telecommunications System (UMTS); General Packet Radio Service (GPRS); Service description; Stage 2
3GPP TS 23.204 V8.0.0	Technical Specification Group Core Network and Terminals; Support of Short Message Service (SMS) over generic 3GPP Internet Protocol (IP) access; Stage 2
3GPP TS 23.271 V18.0.0	Technical Specification Group Core Network and Terminals; Functional stage 2 description of Location Services (LCS)
3GPP TS 23.272 V18.0.0	LTE; Circuit Switched (CS) fallback in Evolved Packet System (EPS); Stage 2
3GPP TS 23.273 V18.10.0	Technical Specification Group Core Network and Terminals; 5G System (5GS) Location Services (LCS); Stage 2
3GPP TS 23.316 V18.7.0	Technical Specification Group Core Network and Terminals; Wireless and wireline convergence access support for the 5G System (5GS)
3GPP TS 23.401 V18.8.0	LTE; General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access
3GPP TS 23.402 V18.3.0	Universal Mobile Telecommunications System (UMTS); LTE; Architecture enhancements for non-3GPP accesses

3GPP TS 23.501 V18.10.0	Technical Specification Group Services and System Aspects; System Architecture for the 5G System; Stage 2
3GPP TS 23.502 V18.10.0	Technical Specification Group Services and System Aspects; Procedures for the 5G System; Stage 2
3GPP TS 23.503 V18.10.0	Technical Specification Group Services and System Aspects; Policy and Charging Control Framework for the 5G System; Stage 2
3GPP TS 24.007 V18.3.0	Technical Specification Group Core Network and Terminals; Mobile radio interface signalling layer 3; General aspects
3GPP TS 24.008 V18.8.0	Technical Specification Group Core Network and Terminals; Mobile radio interface Layer 3 specification; Core network protocols; Stage 3
3GPP TS 24.341 V18.0.0	Technical Specification Group Core Network and Terminals; Support of SMS over IP networks; Stage 3
3GPP TS 24.501 V18.11.1	Technical Specification Group Services and System Aspects; Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3
3GPP TS 24.502 V18.7.0	Technical Specification Group Core Network and Terminals; Access to the 3GPP 5G Core Network (5GCN) via Non-3GPP Access Networks (N3AN); Stage 3
3GPP TS 29.060 V18.0.0	Technical Specification Group Core Network and Terminals; General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp interface
3GPP TS 29.163 V18.1.0	Technical Specification Group Core Network and Terminals; Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and Circuit Switched (CS) networks
3GPP TS 29.274 V18.8.0	LTE; 3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3
3GPP TS 29.518 V18.10.0	Technical Specification Group Core Network and Terminals; 5G System; Access and Mobility Management Services; Stage 3
3GPP TS 29.520 V18.10.0	Technical Specification Group Core Network and Terminals; 5G System; Network Data Analytics Services; Stage 3
3GPP TS 29.540 V18.5.0	Technical Specification Group Core Network and Terminals; 5G System; SMS Services; Stage 3
3GPP TS 29.561 V18.5.0	Technical Specification Group Core Network and Terminals; 5G System; Interworking between 5G Network and external Data Networks; Stage 3
3GPP TS 29.562 V18.6.0	Technical Specification Group Core Network and Terminals; 5G System; Home Subscriber Server (HSS) services; Stage 3
3GPP TS 29.563 V18.6.0	Technical Specification Group Core Network and Terminals; 5G System; Home Subscriber Server (HSS) services for interworking with Unified Data Management (UDM); Stage 3

3GPP TS 29.571 V18.10.0	Technical Specification Group Core Network and Terminals; 5G System; Common Data Types for Service Based Interfaces; Stage 3
3GPP TS 29.572 V18.9.0	Technical Specification Group Core Network and Terminals; 5G System; Location Management Services; Stage 3
3GPP TS 29.573 V18.10.0	Technical Specification Group Core Network and Terminals; 5G System; Public Land Mobile Network (PLMN) Interconnection; Stage 3
3GPP TS 32.240 V18.9.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; Charging architecture and principles
3GPP TS 32.251 V18.0.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; Packet Switched (PS) domain charging
3GPP TS 32.255 V18.7.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; 5G data connectivity domain charging
3GPP TS 32.256 V18.6.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; 5G connection and mobility domain charging
3GPP TS 32.260 V18.3.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; IP Multimedia Subsystem (IMS) charging
3GPP TS 32.274 V18.1.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; Short Message Service (SMS) charging
3GPP TS 32.275 V18.0.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; MultiMedia Telephony (MMTel) charging
3GPP TS 32.291 V18.10.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; 5G system, charging service; Stage 3
3GPP TS 33.210 V18.1.0	Technical Specification Group Services and System Aspects; Network Domain Security (NDS); IP network layer security
3GPP TS 33.226 V18.0.0	Technical Specification Group Services and System Aspects; Security assurance for IP Multimedia Subsystem (IMS)
3GPP TS 33.310 V18.7.0	Technical Specification Group Services and System Aspects; Network Domain Security (NDS); Authentication Framework (AF)
3GPP TS 33.328 V18.4.0	Technical Specification Group Services and System Aspects; IP Multimedia Subsystem (IMS) media plane security
3GPP TS 33.401 V18.3.0	Technical Specification Group Services and System Aspects; 3GPP System Architecture Evolution (SAE); Security architecture

3GPP TS 33.501 V18.10.0	Technical Specification Group Services and System Aspects; Security architecture and procedures for 5G system
3GPP TS 33.535 V18.8.0	Technical Specification Group Services and System Aspects; Authentication and Key Management for Applications (AKMA) based on 3GPP credentials in the 5G System (5GS)
3GPP TS 36.300 V18.5.0	Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2
3GPP TS 36.413 V18.3.0	Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)
3GPP TS 37.340 V18.6.0	Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA) and NR; Multi-connectivity; Stage 2
3GPP TS 37.355 V18.5.0	Technical Specification Group Radio Access Network; LTE Positioning Protocol (LPP)
3GPP TS 38.300 V18.6.0	Technical Specification Group Radio Access Network; NR; NR and NG-RAN Overall Description; Stage 2
3GPP TS 38.413 V18.6.0	Technical Specification Group Radio Access Network; NG-RAN; NG Application Protocol (NGAP)
IETF RFC 3629	UTF-8, a Transformation Format of ISO 10646
IETF RFC 3261	SIP: Session Initiation Protocol
IETF RFC 4122	A Universally Unique IDentifier (UUID) URN Namespace
IETF RFC 4180	Common Format and MIME Type for Comma-Separated Values (CSV) Files
IETF RFC 9580	OpenPGP Message Format
IETF RFC 4975	The Message Session Relay Protocol (MSRP)
IETF RFC 5321	Simple Mail Transfer Protocol
IETF RFC 5322	Internet Message Format
IETF RFC 5905	Network Time Protocol Version 4, Protocol and Algorithms Specification
IETF RFC 6530	Overview and Framework for Internationalized Email
IETF RFC 7315	Private Header (P-Header) Extensions to the Session Initiation Protocol (SIP) for the 3GPP
IETF RFC 7542	The Network Access Identifier
IETF RFC 7913	P-Access-Network-Info ABNF Update
IETF RFC 7976	Updates to Private Header (P-Header) Extension Usage in Session Initiation Protocol (SIP) Requests and Responses
IETF RFC 8866	SDP: Session Description Protocol
ISO 3166-1 (2013)	Codes for the representation of names of countries and their subdivisions
ISO 13616 (2007)	Financial services - International bank account number (IBAN)
ITU-T E.164 (11/10)	ITU-T Recommendation E.164, Numbering plan of the international telephone service
ITU-T G.711 (11/88)	ITU-T Recommendation G.711, Pulse code modulation (PCM) of voice frequencies
ITU-T H.248 (06/00)	ITU-T Recommendation H.248, Gateway control protocol

ITU-T H.323 (03/22)	ITU-T Recommendation H.323, Packet-based multimedia communications systems
ITU-T Q.763 (12/99)	ITU-T Recommendation Q.763, Signalling System No. 7 - ISDN User Part formats and codes
ITU-T Q.850 (10/18)	ITU-T Recommendation Q.850, Usage of cause and location in the Digital Subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN user part
ITU-T Q.931 (05/98)	ITU-T Recommendation Q.931, “ISDN user-network interface layer 3 specification for basic call control”
ITU-T Q.699 (09/97)	ITU-T Recommendation Q.699, “Interworking of Signalling Systems – Interworking between Digital Subscriber Signalling System No. 1 and Signalling System No. 7
ITU-T Q.1912.5 (01/2018)	ITU-T Recommendation Q.1912.5, “Interworking between session initiation protocol (SIP) and bearer independent call control protocol or ISDN user part”
ITU-T X.680 (02/21)	ITU-T Recommendation X.680, Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation
ITU-T X.690 (02/21)	ITU-T Recommendation X.690; Data Networks and Open System Communication – OSI networking and system aspects – Abstract Syntax Notation One (ASN.1)
BBF TR-470 Issue 2 (03/2022)	Broadband Forum, 5G Wireless Wireline Convergence Architecture.
GSMA IR.61 V14.0	GSM Association, Official Document IR.61; Wi-Fi Roaming Guidelines
GSMA IR.65 V36.0	GSM Association, Official Document IR.65; IMS Roaming, Interconnection and Interworking Guidelines
GSMA IR.88 V28.0	GSM Association, Official Document IR.88; EPS Roaming Guidelines
GSMA IR.92 V21.0	GSM Association, Official Document IR.92; IMS Profile for Voice and SMS
GSMA NG.113 V12.0	GSM Association, Official Document NG.113, 5GS Roaming Guidelines
GSMA RCC.07 V14.0	GSM Association, Official Document RCC.07; Rich Communication Suite -- Advanced Communications Services and Client Specification
GSMA RCC.71 V3.0	GSM Association, Official Document RCC.71; RCS Universal Profile Service Definition Document
GSMA SGP.01 V4.3	GSM Association, Official Document SGP.01; Embedded SIM Remote Provisioning Architecture
GSMA SGP.02 V4.3	GSM Association, Official Document SGP.02; Remote Provisioning Architecture for Embedded UICC Technical Specification
GSMA SGP.21 V3.0	GSM Association, Official Document SGP.21; RSP Architecture
GSMA SGP.22 V3.0	GSM Association, Official Document SGP.22; RSP Technical Specification
OMA-TS-MLP-V3_5-20181211-C.	Open Mobile Alliance; Mobile Location Protocol, Candidate Version 3.5.
OMA-TS-MMS_ENC-V1_3-20110913-A	Open Mobile Alliance; Multimedia Messaging Service Encapsulation Protocol, Version 1.3

Table 10-1: List of technical specifications