Annex 1 to the Ordinance of the 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 2.0

Entry into force: 1 March 2020

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
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)
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
CS	Circuit-switch
CSP	Communications Service Provider
CUG	Closed User Group
DCF77	German longwave time signal and standard-frequency radio station.
DDI	Direct Dialling In
DN	Data Network
DNN	Data Network Name
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
EJPD	Eidgenössisches Justiz- und Polizeidepartement (see FDJP)
EN-DC	E-UTRA – NR Dual Connectivity
EPS	Evolved Packet System
ETSI	European Telecommunications Standards Institute
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
GUAMI	Globally Unique AMF Identifier
HI	Handover Interface
HLC	High Layer Compatibility
HTTP	HyperText Transfer Protocol
HTTPS	HyperText Transfer Protocol over Secure Socket Layer
IANA	Internet Assigned Numbers Authority
IETF	Internet Engineering Task Force

IIF	Internal Interception 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
LAN	Local Area Network
LEA	Law Enforcement Agency
LEMF	Law Enforcement Monitoring Facility
LI	Lawful Interception
LICF	Lawful Interception Control Function
LIPF	Lawful Interception Provisioning Function
LIID	Lawful Interception Identifier
MAP	Mobile Application Part
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
NAI	Network Access Identifier
NAS	Non-Access Stratum
NCGI	NR Cell Global Identity
NCI	NR Cell Identity
NEID	Network Element Identifier
NF	Network Function
NPLI	Network Provided Location Information
NR	New Radio
NRF	Network Repository Function
OFCOM	Federal Office of Communications (Switzerland)
OID	Object Identifier
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

S-GW	Serving Gateway
SAI	Service Area Identity
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
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
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
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
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
xDSL	Digital subscriber line (x stands for various types)
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)
Collection 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	Information requests Abbr.: IRTask	HI-A according to ETSI TS 102 657 V1.24.1 Annex 1 Section 4.2.4	Secure Email Annex 1 Section 4.3.3.2	Telephone / Fax Annex 1 Section 4.4
54 to 59, 68a,68b	Real-time interception instructions Abbr.: LITask	HI-1 according to ETSI TS 103 120 V1.3.1 Annex 1 Section 4.2.2 or 4.2.3	Secure Email Annex 1 Section 4.3.3.1	Telephone / Fax Annex 1 Section 4.4
67b,67c	Real-time interception instructions for emergency search	Telephone and HI-1 according to ETSI TS 103 120 V1.3.1 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 and Fax Annex 1 Section 4.4
60 to 66, 67a,67d, 68c,68d	Retroactive (aka historical data or retained data) interception instructions Abbr.: RDTask	HI-A according to ETSI TS 102 657 V1.24.1 Annex 1 Section 4.2.4	Secure Email Annex 1 Section 4.3.3.2	Telephone / Fax 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	4th Administrative HI
General and operational information notifications	Secure Email Annex 1 Section 4.3.4.1	Fax Annex 1 Section 4.4	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 V1.3.1) 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 V1.24.1)	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 V1.3.1)

This whole section 4.2.2 is for reference only. This HI-1 XML over HTTP 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 V1.3.1 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 V1.3.1 Annex A.3 for a single "Central Authority" (warrant = order).

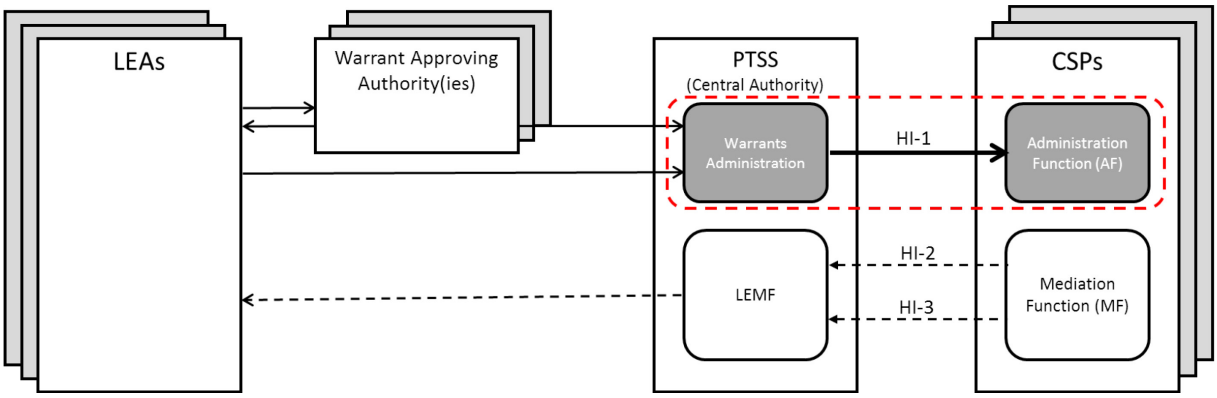

Figure 4-1: HI-1 administrative interface for real-time interception instructions

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 V1.3.1 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.

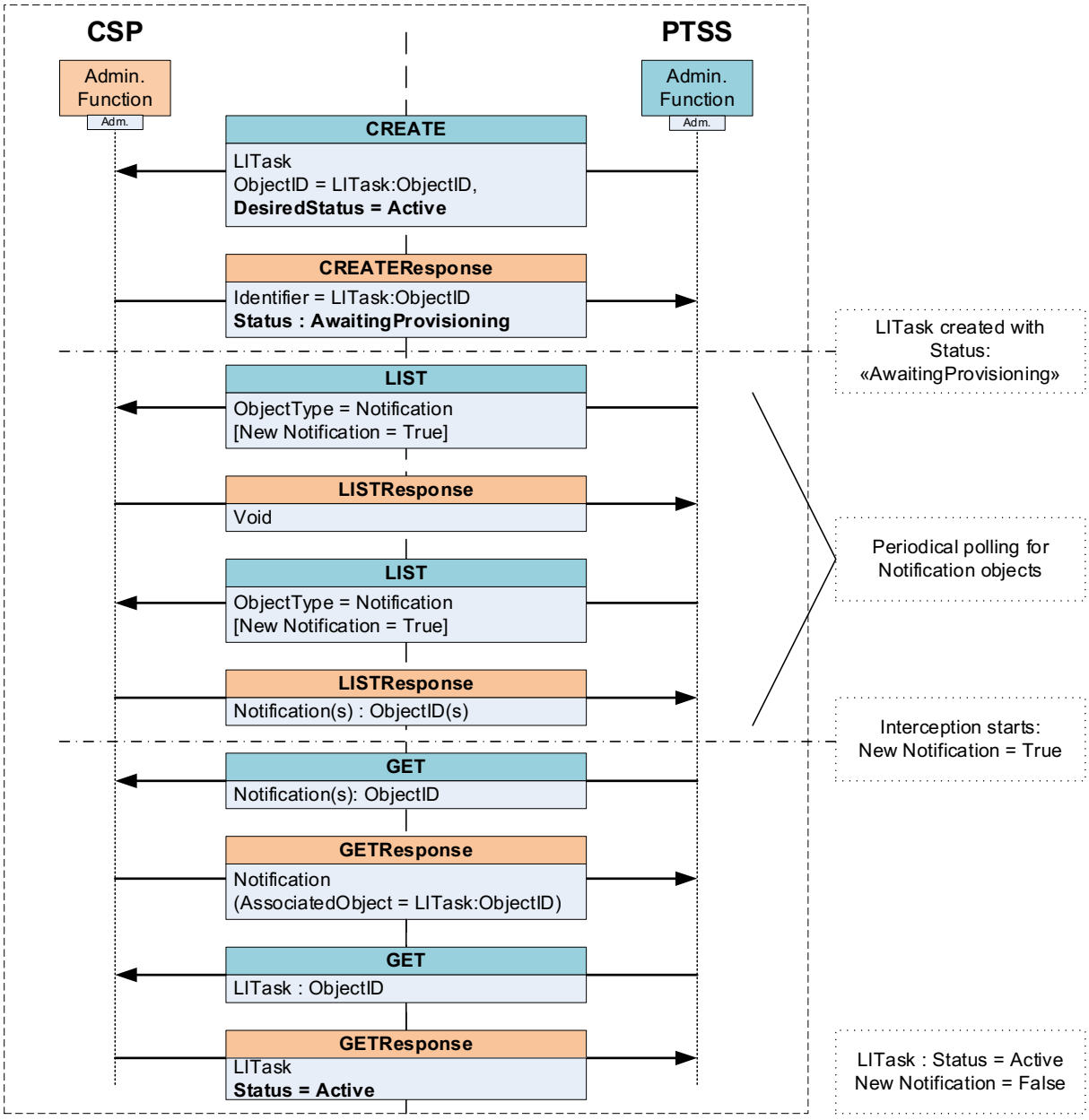

Figure 4-2: Message flow for a real-time interception activation instruction based on HTTP

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.

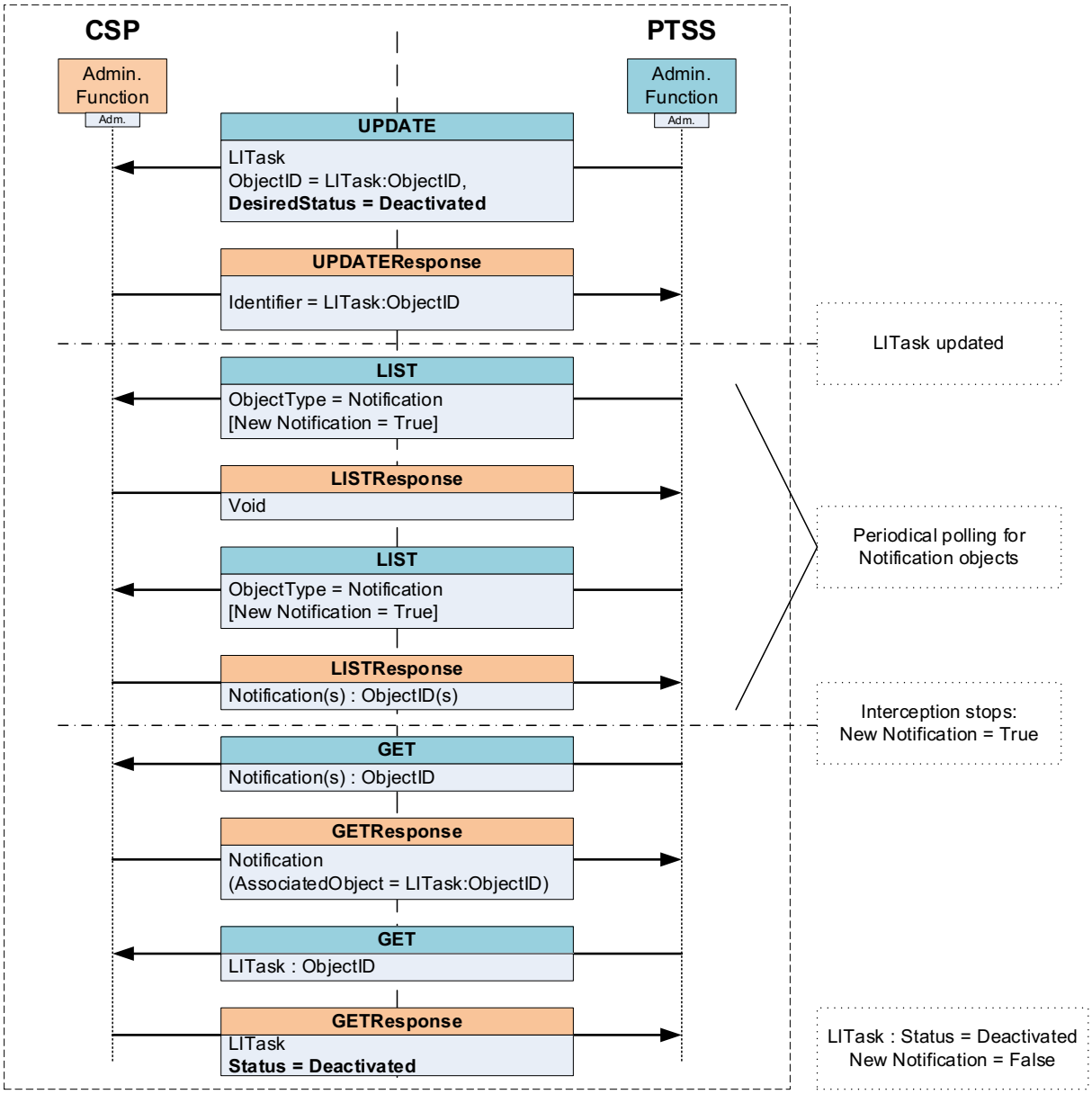

Figure 4-3: Message flow for a real-time interception deactivation instruction based on HTTP

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.

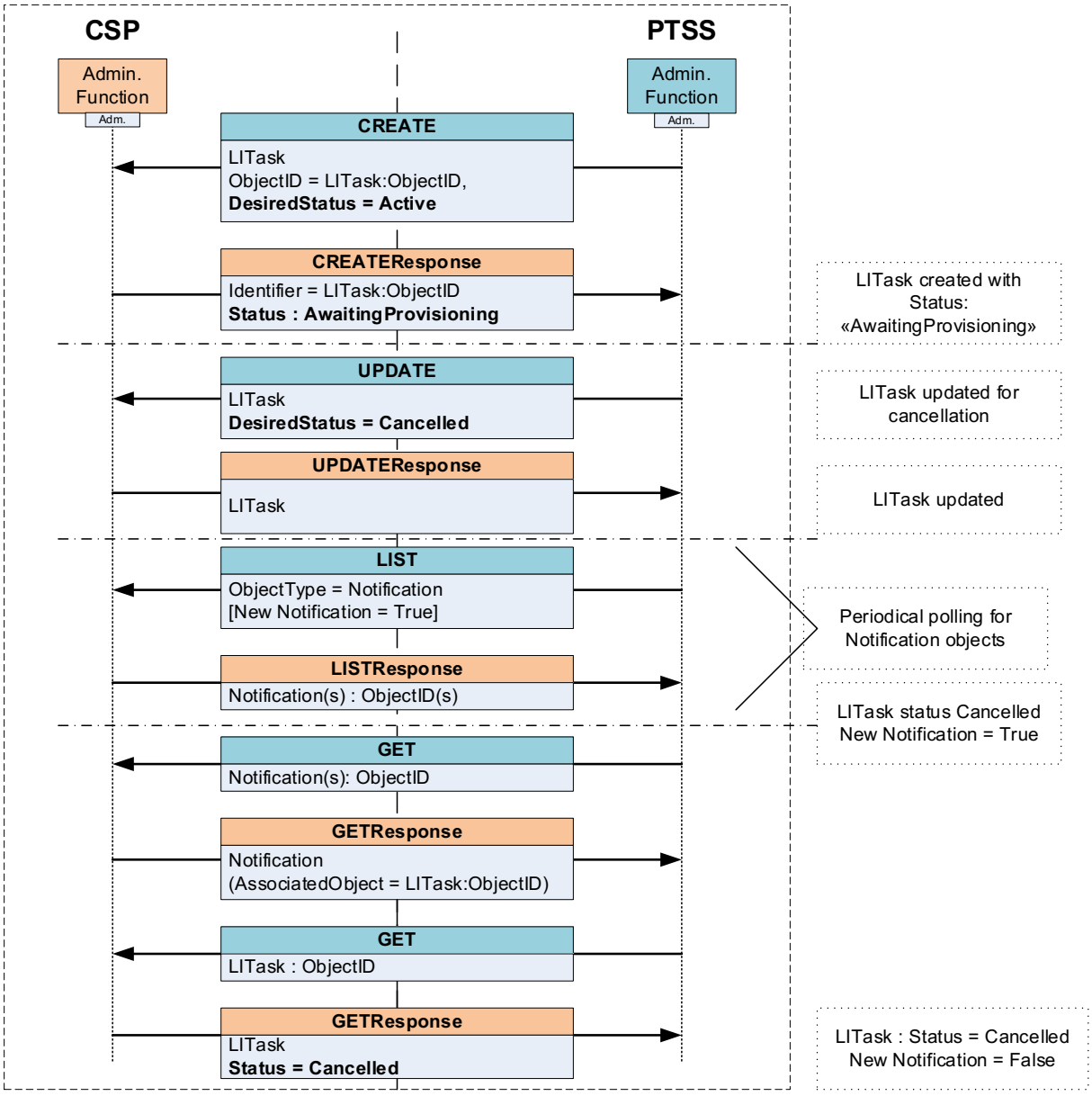

Figure 4-4: Message flow for a real-time interception cancellation instruction based on HTTP

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.

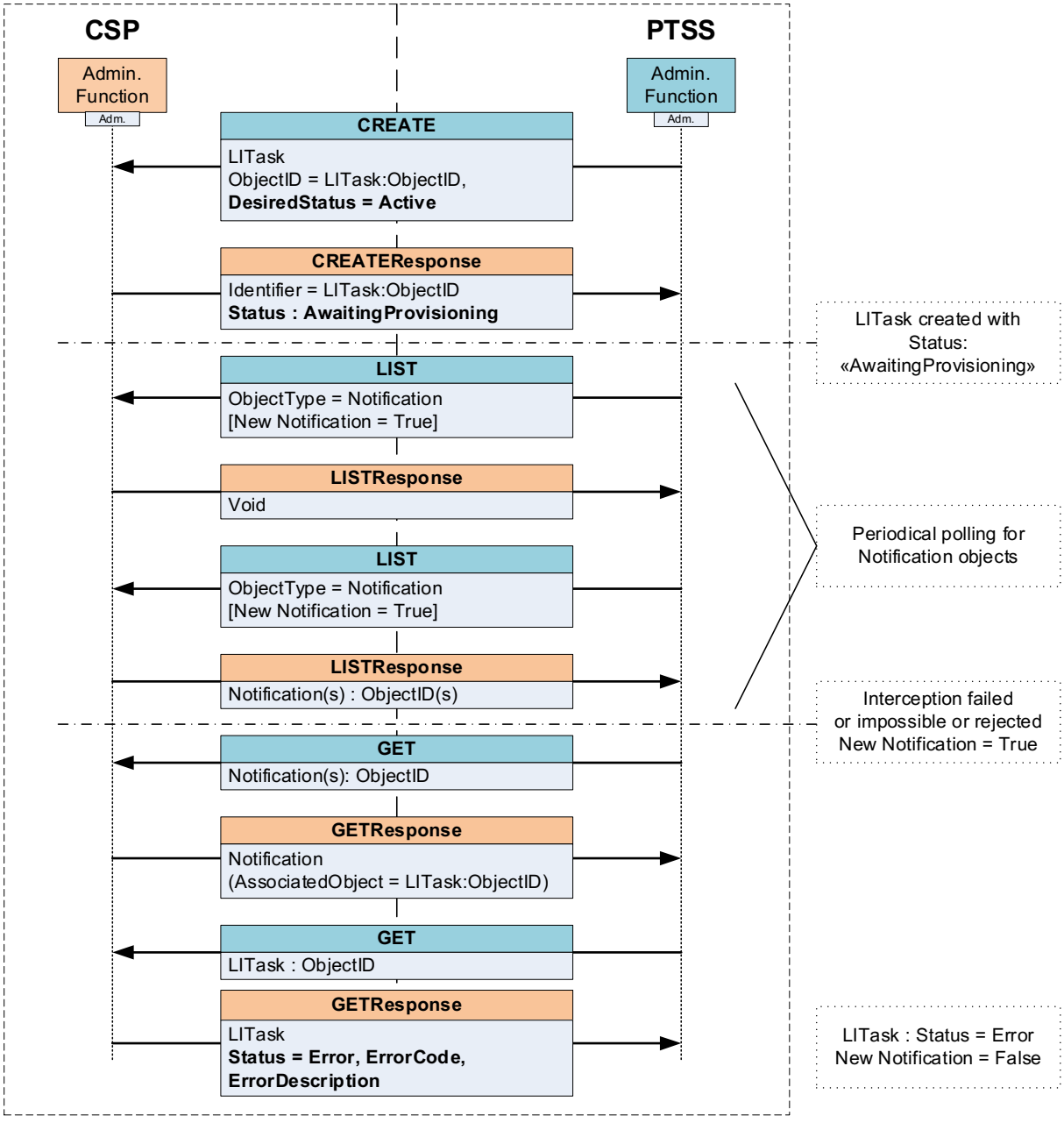

Figure 4-5: Message flow in case of error or invalidity of a real-time interception instruction based on HTTP

4.2.2.7 ETSI TS 103 120 V1.3.1 requirements and options

The table below present the Swiss national options according to ETSI TS 103 120 V1.3.1 and the real-time interception instructing process.

Clause ETSI TS 103 120 V1.3.1	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 V2.3.1)	Currently V2.0.0
6.2.4	**UniqueIdentifier:** Unique identifier sufficient for identifying the object/field within the country. LongString (see ETSI TS 103 280 V2.3.1)	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 V1.3.1	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 V1.3.1	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 V1.3.1 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 V1.3.1 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 V1.3.1	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
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.

Clause ETSI TS 103 120 V1.3.1	Available options for Swiss applications	Additional requirements or specifications
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:** PTSS **Dictionary Name:** DeliveryProfile **Dictionary authorised values:** Production Integration_1 Integration_2
8.2.12	**Flags**	**Dictionary owner:** PTSS **Dictionary Name:** FlagsStatus **Dictionary authorized 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)

Clause ETSI TS 103 120 V1.3.1	Available options for Swiss applications	Additional requirements or specifications
9.3.2	**Clinet/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 V1.3.1 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 don't 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 V1.3.1 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
Version/ NationalProfileOwner		
	National profile owner	PTSS
Version/ NationalProfileVersion		
	ShortString	V2.0.0

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 V1.3.1 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/ DeliverProfile/ 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 V1.3.1 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 V1.3.1 Clause 6.4		
LIST request Notification		
Element or attribute	**Description**	**Example**
LIST		
ObjectType/ common:Owner		
	ObjectType Dictionary entry (ETSI TS 103 120 V1.3.1)	ETSI
ObjectType/ common:Name		
	ObjectType Dictionary entry (ETSI TS 103 120 V1.3.1)	ObjectTypeDictionary
ObjectType/ common:Value		
	ObjectType Dictionary entry (ETSI TS 103 120 V1.3.1)	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 V1.3.1 Clause 6.4		
LISTResponse Notification		
Element or attribute	**Description**	**Example**
LISTResponse		
ObjectType/ common:Owner		
	ObjectType Dictionary entry (ETSI TS 103 120 V1.3.1)	ETSI
ObjectType/ common:Name		
	ObjectType Dictionary entry (ETSI TS 103 120 V1.3.1 § 6.4.8)	ObjectTypeDictionary
ObjectType/ common:Value		
	ObjectType Dictionary entry (ETSI TS 103 120 V1.3.1 § 6.4.8)	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 V1.3.1 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 V1.3.1 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 V1.3.1 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 V1.3.1 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 Retained Data Component systems, and this requires a new compliance assessment.

Applicable XML Schema	Requirement or instruction for application
ETSI TS 103 120 V1.3.1	
XML Schema (xsd)	ts_103120v010301p0_Common.xsd
	ts_103120v010301p0_Core.xsd
	ts_103120v010301p0_Dictionaries.xsd
	ts_103120v010301p0_LITask.xsd
	ts_103120v010301p0_Notification.xsd
	_PTSSNationalProfile.xsd
XML file	ts_103120v010301p0_ETSIDictionaryDefinitions.xml
	_PTSS_DictionaryDefinitions V2.0.0.xml
ETSI TS 103 280 V2.3.1	
XML Schema (xsd)	ts_103280v020301p0.xsd

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

4.2.3 Ad hoc HI-1 XML over HTTP administrative interface for intructing 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 V1.3.1 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 V1.3.1 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 V1.3.1).

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.

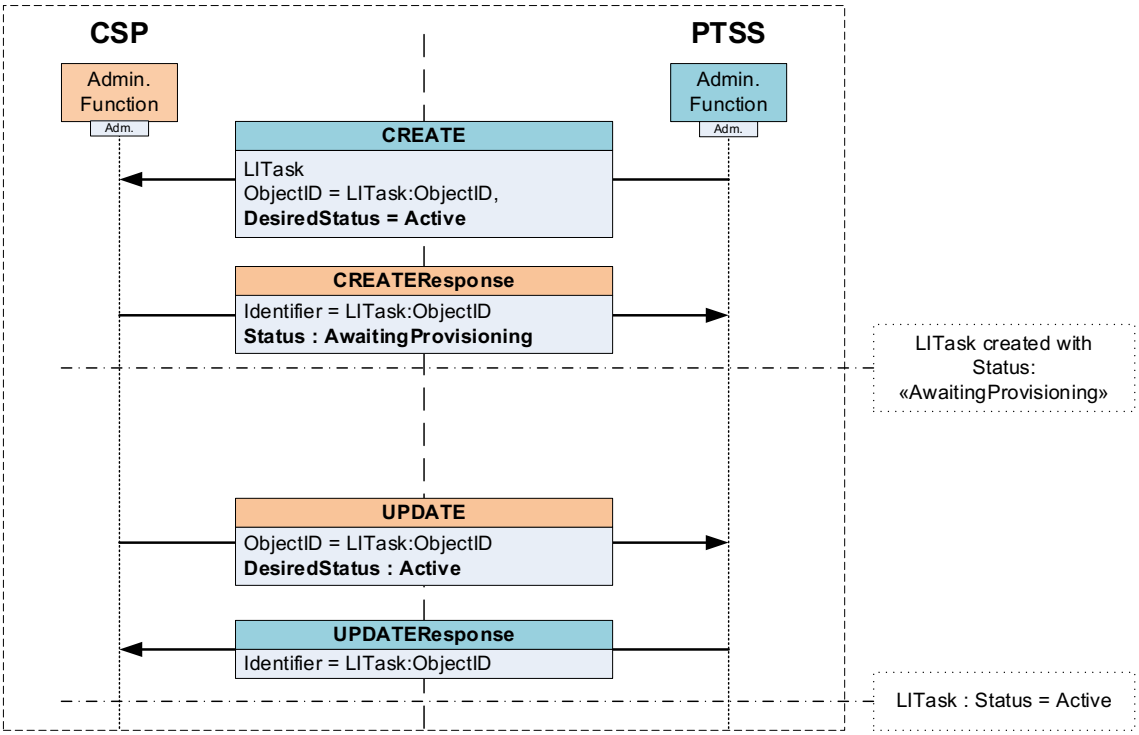

Figure 4-7: Message flow for a real-time interception activation instruction based on ad hoc HI1 interface

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.

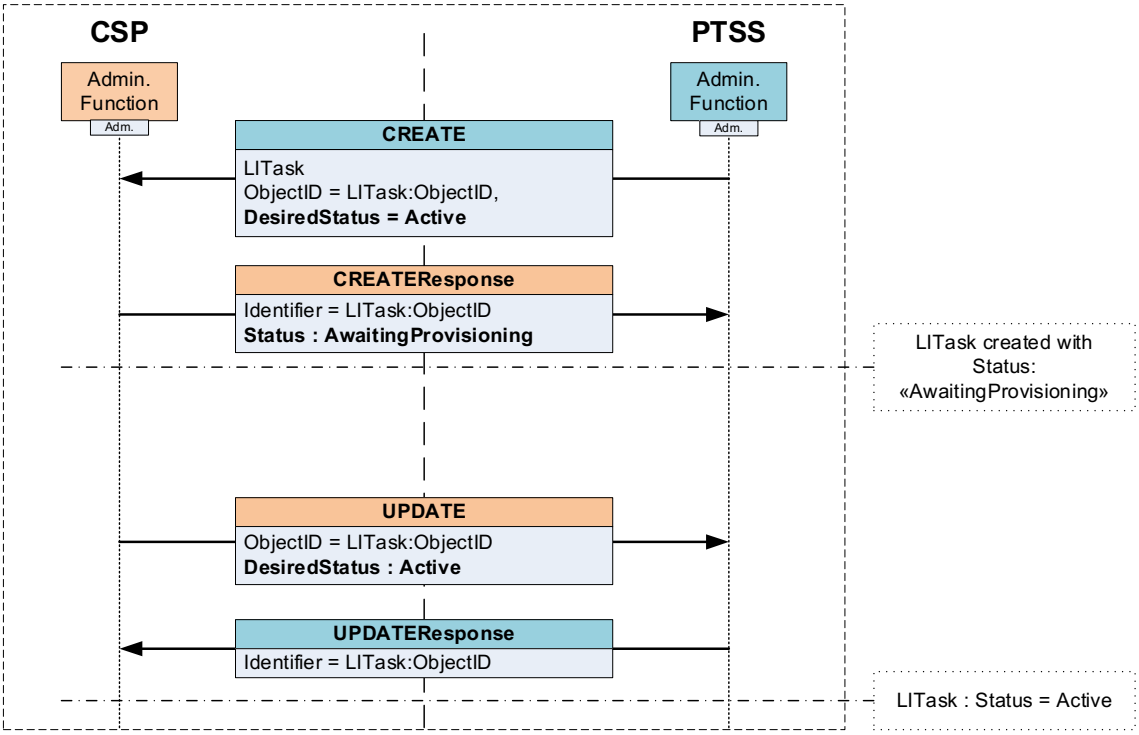

Figure 4-8: Message flow for a real-time interception deactivation instruction based on ad hoc HI1 interface

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.

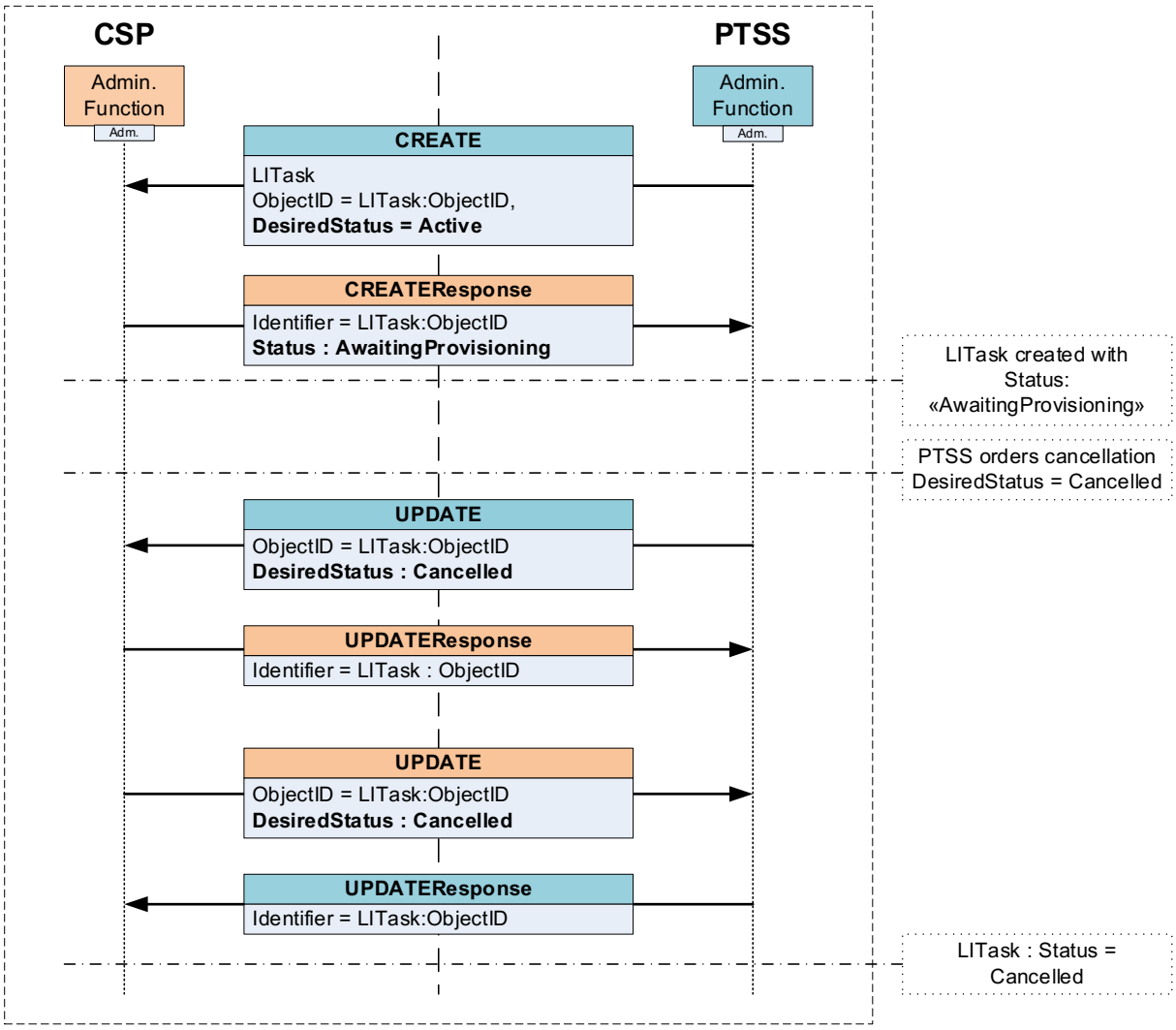

Figure 4-9: Message flow for a real-time interception cancellation instruction based on ad hoc HI1 interface

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.

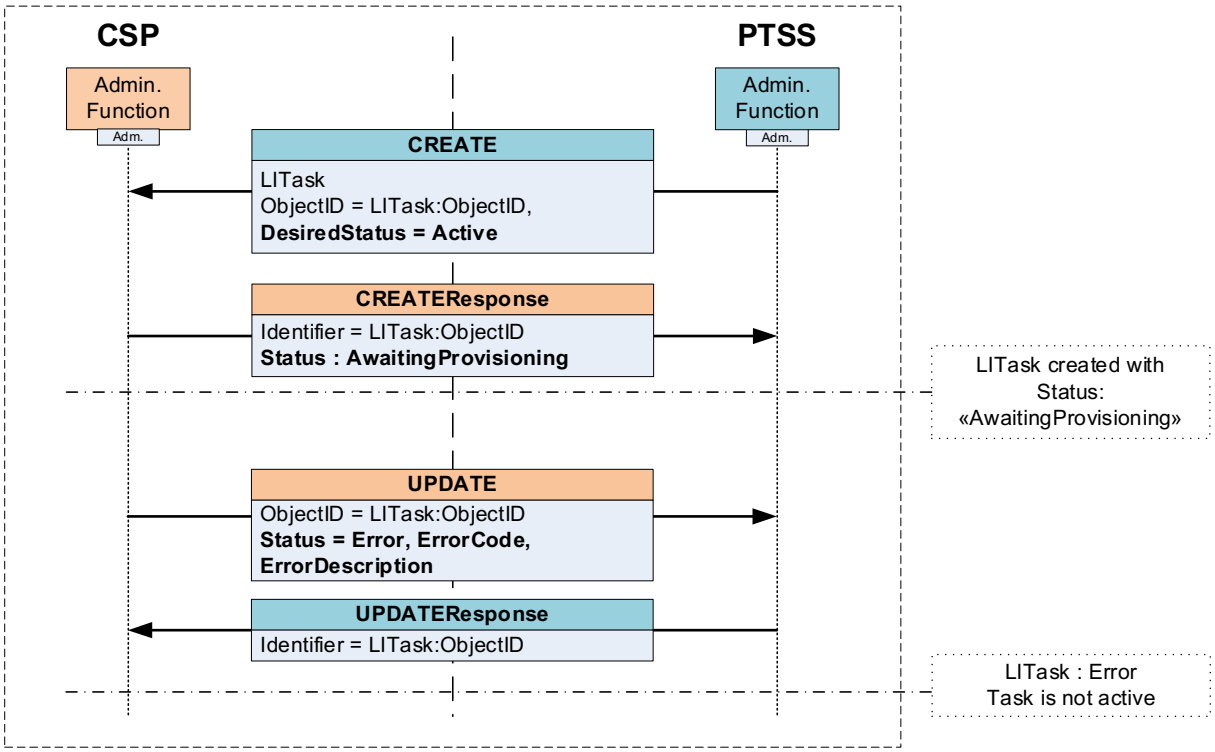

Figure 4-10: Message flow for a real-time interception instruction in case of error or invalidity based on ad hoc HI1 interface

4.2.3.8 Ad hoc HI1 interface: ETSI TS 103 120 V1.3.1 requirements and options

The table below present the Swiss national options for the implementation of the ad hoc HI1 interface according to ETSI TS 103 120 V1.3.1 and the exchange of simple XML messages via HTTPS process.

Clause ETSI TS 103 120 V1.3.1	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 V2.3.1)	Currently V2.0.0
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:**

Clause ETSI TS 103 120 V1.3.1	Available options for Swiss applications	Additional requirements or specifications
		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:** 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 V1.3.1 Annex D.

Clause ETSI TS 103 120 V1.3.1	Available options for Swiss applications	Additional requirements or specifications
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 authorized 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** 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. ***Cancelled***: The Task has been permanently cancelled

Clause ETSI TS 103 120 V1.3.1	Available options for Swiss applications	Additional requirements or specifications
		Deactivated: The Task has been deactivated by the PTSS.
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 support 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
8.2.12	**Flags**	**Dictionary owner:** PTSS **Dictionary Name:** FlagsStatus **Dictionary authorised values:** Normal TEST_PTE TEST_PTSA TEST_PTSE TEST_PTSTR TEST_PTSTE TEST_CTT TEST_ATT

Table 4-16: Ad hoc HI-1 interface ETSI TS 103 120 V1.3.1 requirements and options

Note: 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 V1.3.1 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/ DeliverProfile/ 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 V1.2.1).	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 V1.3.1 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 V1.3.1 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 V1.3.1 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 V1.3.1 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 V1.3.1 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
Generation	Positive integer	2
LastChanged	QualifiedDateTime	2016-12-30T14:30:00+01:00
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 V1.3.1 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 V1.3.1 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 V1.3.1 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 V2.3.1 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 V1.24.1)

Based on ETSI TS 102 657 V1.24.1 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 V1.24.1 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 V1.24.1 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 V1.24.1 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 4880 with the specific requirements and options indicated below:

1. Keys must have at least a 2048-bit size and a validity of at least 3 years.
2. PGP signed and encrypted (email body or email 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 V1.3.1, 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 V1.24.1, 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 V1.3.1 and an instruction form that is more easily readable by non-technical personnel.

The ETSI TS 103 120 V1.3.1 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.

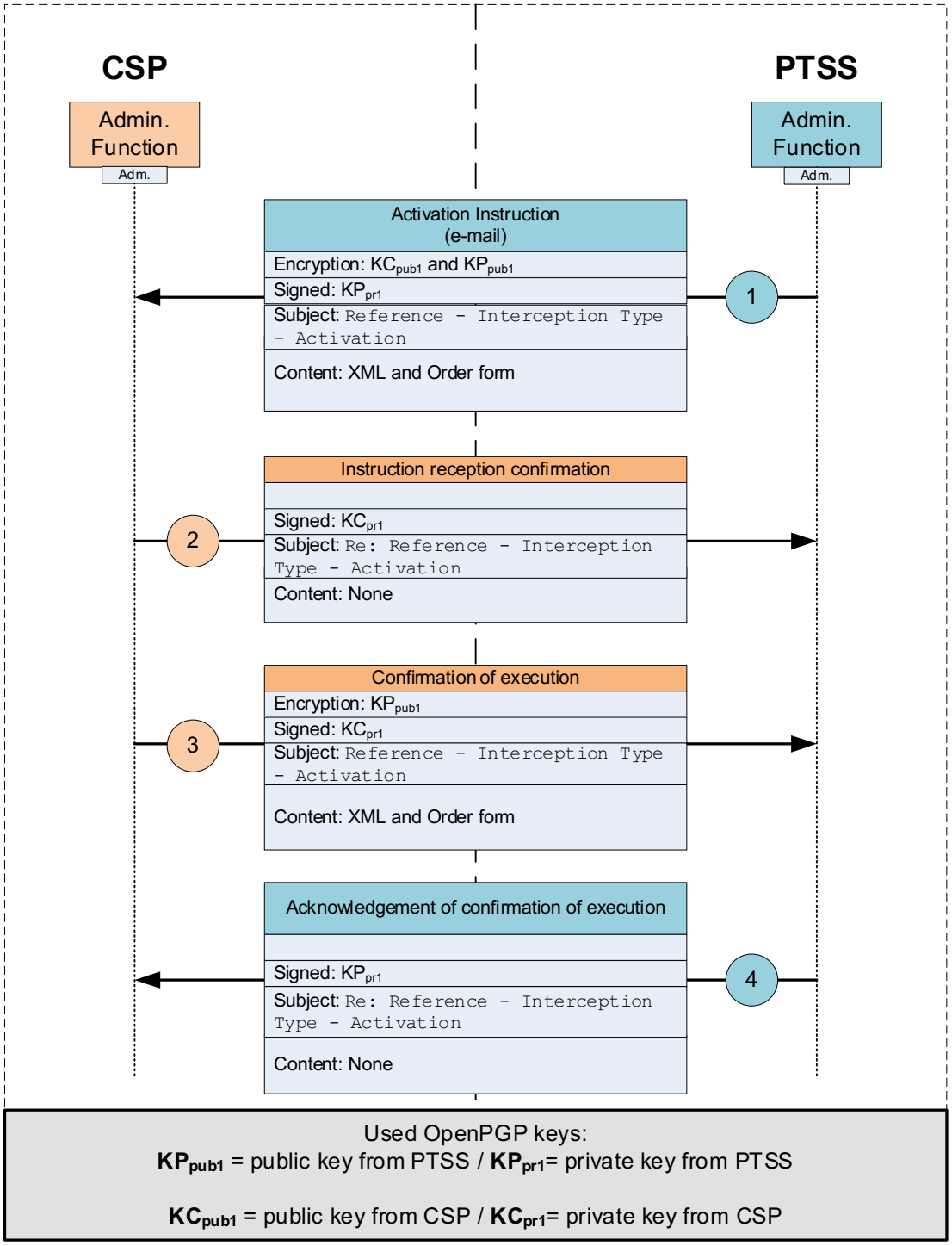

Figure 4-12: Message flow for email activation instruction processing for real-time interceptions

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 PTSS acknowledges the reception of the filled in instruction form to the CSP by sending a simple email response. The email body is the same as in step ③ (already signed and encrypted) and signed with the PTSS key.

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.

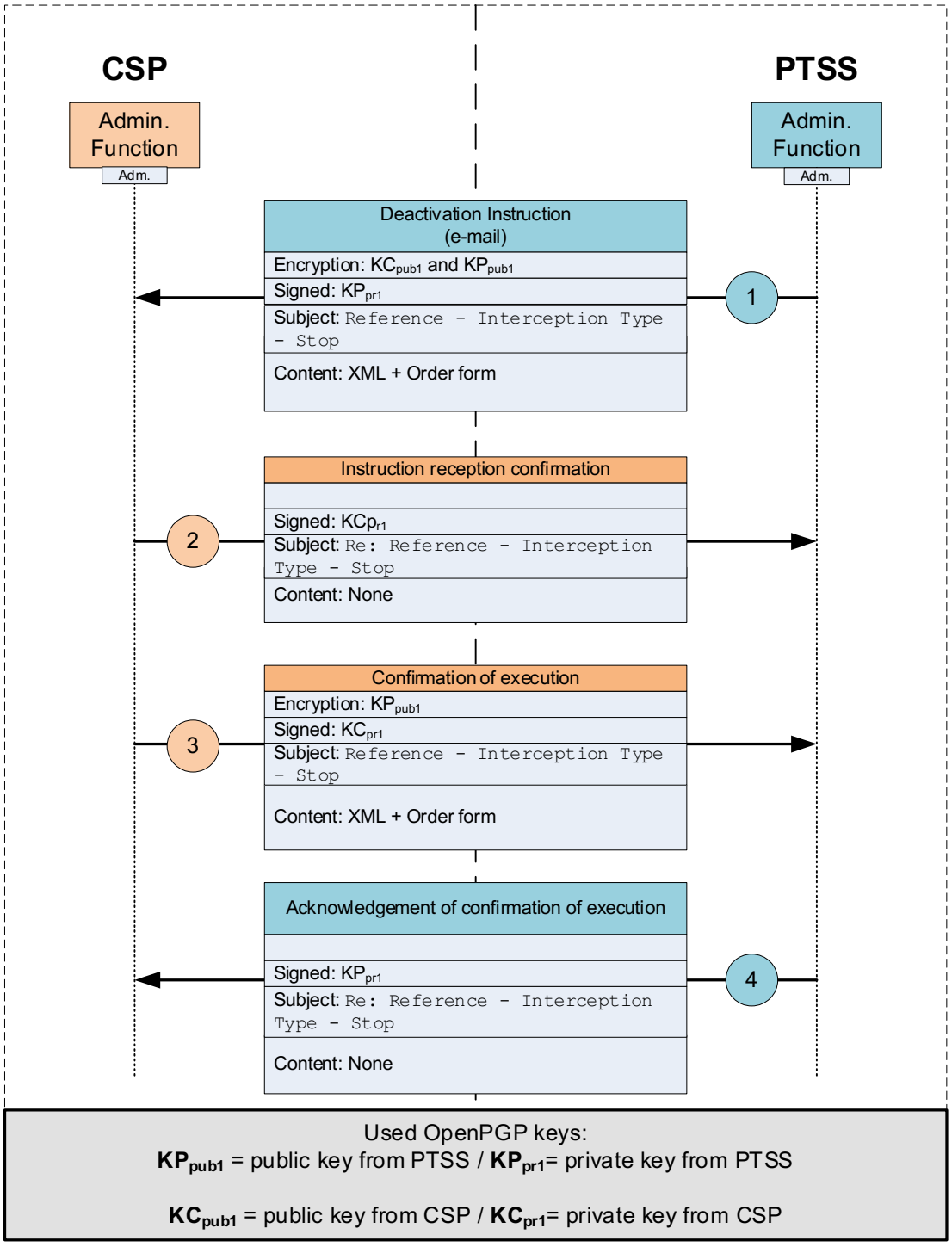

Figure 4-13: Message flow for email deactivation instruction processing for real-time interceptions

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 PTSS acknowledges the reception of the filled in instruction form to the CSP by sending a simple email response. The email body is the same as in step ③ (already signed and encrypted) and signed with the PTSS key.

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.

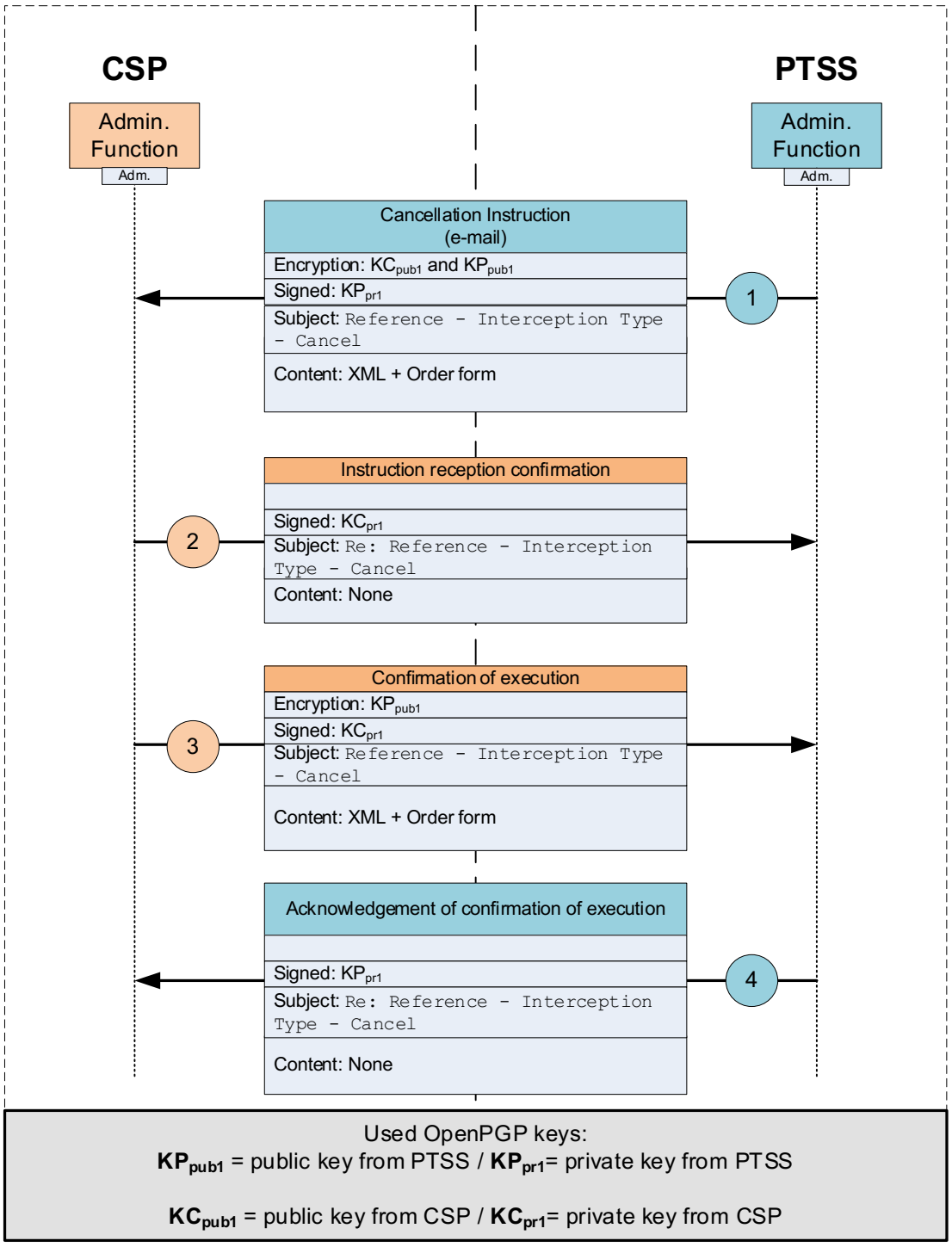

Figure 4-14: Message flow for email cancellation instruction processing for real-time interceptions

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 PTSS acknowledges the reception of the filled in instruction form to the CSP by sending a simple email response. The email body is the same as in step ③ (already signed and encrypted) and signed with the PTSS key.

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.

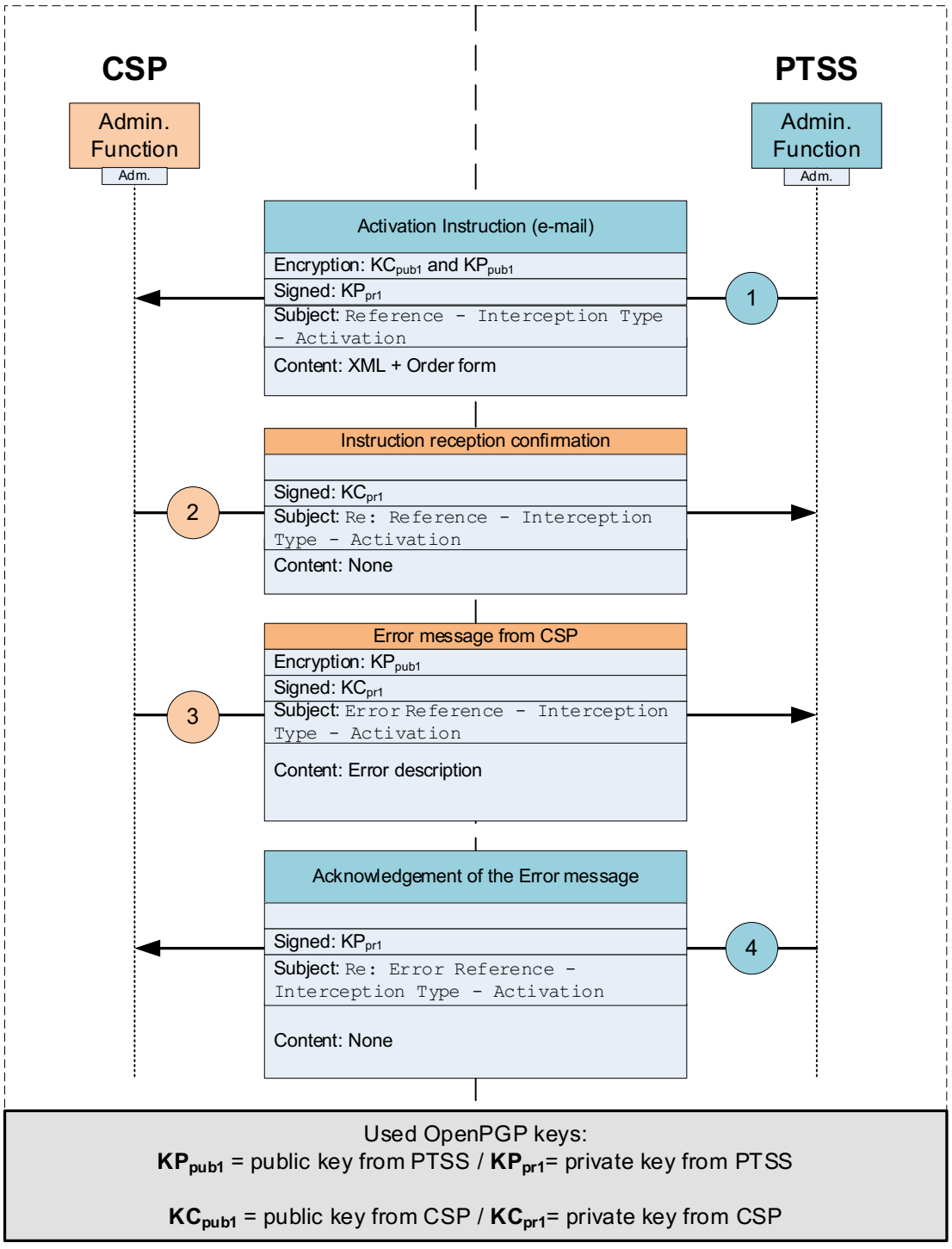

Figure 4-15: Message flow for error of email instruction activation processing for real-time interceptions

In case of error of the interception instruction by the CSP the message flows 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`

Then in step ④ the PTSS acknowledges the reception of the error message.

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 V1.3.1 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 V1.3.1 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
Version/ NationalProfileOwner		
	National profile owner	PTSS
Version/ NationalProfileVersion		
	ShortString	V2.0.0

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/ DeliverProfile/ 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 V1.3.1 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 V1.24.1.

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.

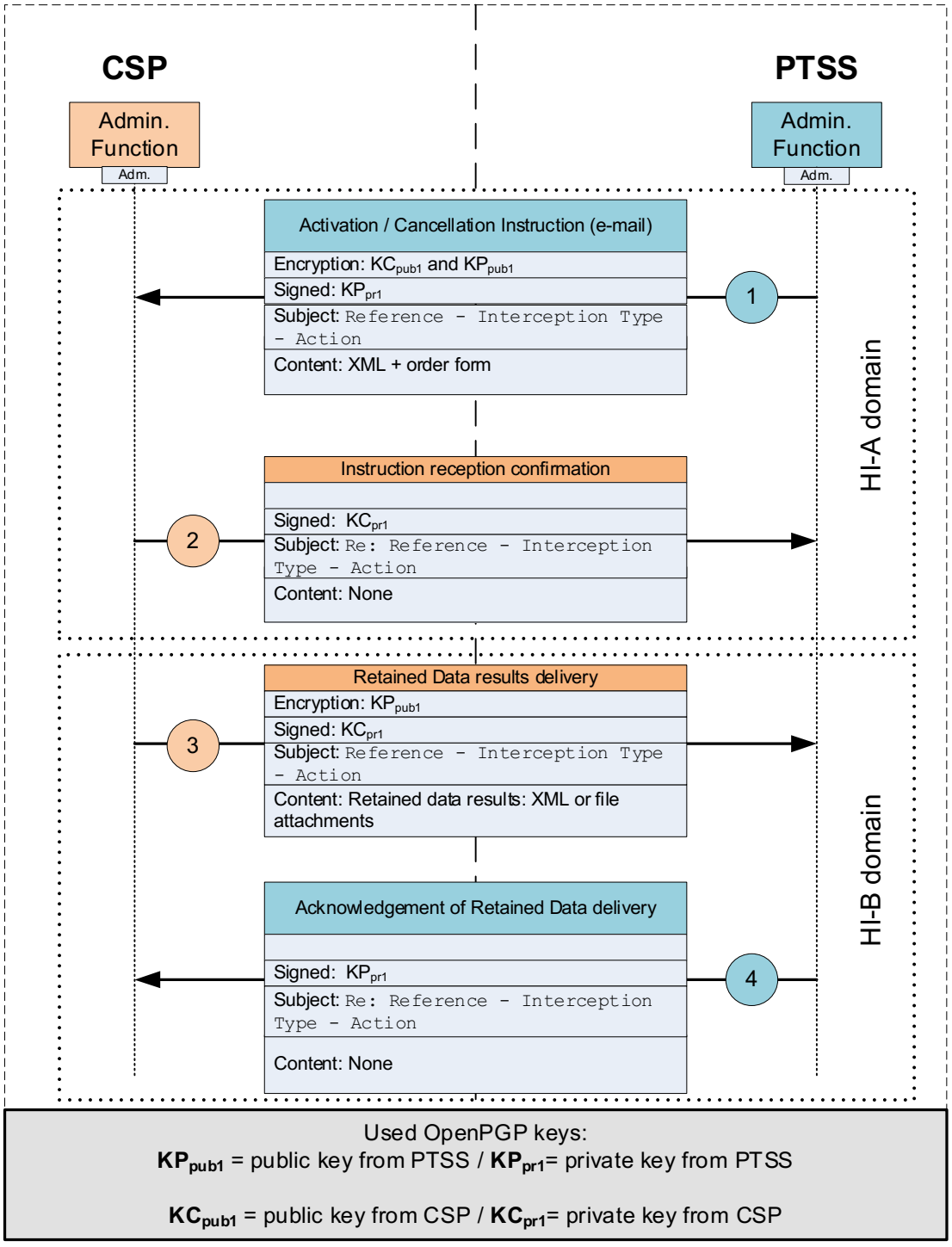

Figure 4-17: Message flow for secure email instruction processing for retained data

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 V1.24.1. 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 Acknowledgement: two different cases may occur:
i) If the CSP delivers the results through the HI-B interface based on HTTPS or SFTP the acknowledgement from PTSS is sent through the same interface.

ii) If the results are delivered via secure email the PTSS acknowledges the reception of the email message to the CSP by sending a simple email response signed with the PTSS key.

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 flows 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`

Then in step ④ the PTSS acknowledges the reception of the error/failure message.

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 confidentiality 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.

4.3.4.2 Transmission of the cell Identification correlation table

When a mobile CSP does not provide the complete location information in the IRI records as described in section 6.3.9.1 it shall provide the PTSS with a cell identification correlation table (aka Cell-ID table).

This cell identification correlation table contains a list of all cell identifications and their corresponding parameters of the mobile CSP, as defined in section 6.3.9.2. An updated version of this table shall be delivered to the PTSS periodically at least every two weeks.

The table type shall be denoted in the subject field of the corresponding email.

4.4 Telephone and fax

For urgent interception instructions and information requests or when no other secure communication channel is available the PTSS may use the telephone or fax 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 6 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 6 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 V1.3.1 Annex C and their corresponding formats according to ETSI TS 103 280 V2.3.1 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	**RT_22_NA_IRI** Network access real-time interception with Interception Related Information only	Identifiers parameters ETSI TS 133 108 V15.5.0 or ETSI TS 102 232-1 V3.19.1 & ETSI TS 102 232-3 V3.7.1 or ETSI TS 102 232-7 V3.6.1 & ETSI TS 133 128 V15.1.0	6.3 6.5.2.2 6.5.3 6.5.5 6.5.8 6.5.9
55 68	**RT_23_NA_CC_IRI** Network access real-time interception with Interception Related Information and Content of Communication	Identifiers parameters ETSI TS 133 108 V15.5.0 or ETSI TS 102 232-1 V3.19.1 & ETSI TS 102 232-3 V3.7.1 or ETSI TS 102 232-7 V3.6.1 & ETSI TS 133 128 V15.1.0	6.3 6.5.2.2 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	**RT_24_TEL_IRI** Telephony and multimedia services real-time interception with Interception Related Information only	Identifiers parameters ETSI TS 101 671 V3.12.1 or ETSI TS 133 108 V15.5.0 or ETSI TS 102 232-1 V3.19.1 & ETSI TS 102 232-5 V3.11.1 or ETSI TS 102 232-1 V3.19.1 & ETSI TS 102 232-6 V3.3.1	6.3 6.5.1 6.5.2 6.5.3 6.5.6 6.5.3 6.5.7

57 68	**RT_25_TEL_CC_IRI** Telephony and multimedia services real-time interception with Interception Related Information and Content of Communication	Identifiers parameters ETSI TS 101 671 V3.12.1 or ETSI TS 133 108 V15.5.0 or ETSI TS 102 232-1 V3.19.1 & ETSI TS 102 232-5 V3.11.1 or ETSI TS 102 232-1 V3.19.1 & ETSI TS 102 232-6 V3.3.1	6.3 6.5.1 6.5.2 6.5.3 6.5.6 6.5.3 6.5.7
58 68	**RT_26_EMAIL_IRI** Email services real-time interception with Interception Related Information only	Identifiers parameters ETSI TS 102 232-1 V3.19.1 & ETSI TS 102 232-2 V3.11.1	6.3 6.5.3 6.5.4
59 68	**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 V3.19.1& ETSI TS 102 232-2 V3.11.1	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_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 101 671 V3.12.1 or ETSI TS 133 108 V15.5.0 or ETSI TS 102 232-1 V3.19.1 & ETSI TS 102 232-5 V3.11.1 or ETSI TS 102 232-1 V3.19.1 & ETSI TS 102 232-6 V3.3.1 or ETSI TS 102 232-7 V3.6.1 & ETSI TS 133 128 V15.1.0	6.3 6.5.1 6.5.2 6.5.3 6.5.6 6.5.3 6.5.7 6.5.8 6.5.9
67 c	**EP_37_RT_IRI** Network access and telephony and multimedia services real-time interception with Interception Related Information only	Identifiers parameters ETSI TS 101 671 V3.12.1 or ETSI TS 133 108 V15.5.0 or ETSI TS 102 232-1 V3.19.1 & ETSI TS 102 232-5 V3.11.1 or ETSI TS 102 232-1 V3.19.1 & ETSI TS 102 232-6 V3.3.1 or ETSI TS 102 232-7 V3.6.1 &	6.3 6.5.1 6.5.2 6.5.3 6.5.6 6.5.3 6.5.7 6.5.8

		ETSI TS 133 128 V15.1.0	6.5.9

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

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 according to ETSI TS 101 671 V3.12.1 §6.1 and ETSI TS 102 232-1 V3.19.1 §5.2.2 and ETSI TS 133 108 V15.5.0§5.1 consists of maximum 25 numbered digits (0..9) for the sub-address option according to ETSI TS 101 671 V3.12.1 annex E respectively to ETSI TS 133 108 V15.5.0 Annex J.

Lawful Interception in Switzerland supports the LIID format for sub-address option according to ETSI TS 101 671 V3.12.1 Annex E and ETSI TS 133 108 V15.5.0 Annex J, but is composed of 15 numbered digits (0..9).

The LIID parameter is generated by the PTSS and provided to the CSP.

a. For the LIID in the Calling Party Number in the circuit switched handover interfaces using ETSI TS 101 671 V3.12.1 or ETSI TS 133 108 V15.5.0:

The LIID delivered to the LEMF in the Calling Party Subaddress, when a CC-link is being established, shall meet the requirements specified in ETSI TS 101 671 V3.12.1 Annex E, Table E.3.5, and ETSI TS 133 108 V15.5.0 Annex J, Table J.2.6, where digit 1 is the most significant digit. After the last digit (maximum digit 15), the field separator determines the end of the field. The subsequent field “direction” shall be rearranged, i.e. mapped into octet 12, whereas the service octets must still be mapped into octets 19-23.

b. For the LIID in the IRI-Records:

For the LIID contained within the IRI-Records, ETSI TS 101 671 V3.12.1 Annex D.5 the IRI-Parameter `LawfulInterceptionIdentifier` applies.
Note that ETSI TS 102 232-1 V3.19.1 imports the `LIID` parameter from ETSI TS 103 280 V2.3.1 and ETSI TS 133 108 V15.5.0 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 §6.2 and ETSI TS 102 232-1 V3.19.1 §5.2.4 and ETSI TS 133 108 V15.5.0 §5.1.2.

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:

a. For insertion of the OperatorID in the Subaddress field, ETSI TS 101 671 V3.12.1 Annex E and ETSI TS 133 108 V15.5.0 Annex J apply.

b. For the OperatorID contained within the IRI-Records, ETSI TS 101 671 V3.12.1 Annex D.5 and ETSI TS 102 232-1 V3.19.1 Annex A.2 and ETSI TS 133 108 V15.5.0 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:

a. For the NEID conveyed in the Calling Party Number in the circuit switched handover interfaces using ETSI TS 101 671 V3.12.1 or ETSI TS 133 108 V15.5.0:

For the NEID delivered to LEMF within the Calling Party Number information element, the encoding of the NEID according to ETSI TS 101 671 V3.12.1 Annex E.4.2 or ETSI TS 133 108 V15.5.0 Annex J.2.4.2 applies, with the following clarification: The CSP shall make provision that at the Handover Interface the Calling Party Number is delivered to the LEMF in one of the formats specified below, the choice (on a call-by-call basis) being a CSP option:

i. national number with Type of Number “unknown” with prefix (in Switzerland the prefix is “0”)
ii. national number with Type of Number “national number”
iii. international number with Type of Number “unknown” with prefix (in Switzerland the prefix is “00”)
iv. international number with Type of Number “international number”
v. Numbering Plan Identification shall be “ISDN/telephony numbering plan”

b. For the NEID in the IRI-Records:

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 V3.19.1 and ETSI TS 133 108 V15.5.0 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 §6.2.2 and ETSI TS 102 232-1 V3.19.1 §5.2.4.

The CIN parameter is assigned by the CSP.

a. For the CIN in the Called Party Number in the circuit switched handover interfaces using ETSI TS 101 671 V3.12.1 or ETSI TS 133 108 V15.5.0:

The CIN delivered to the LEMF in the Called Party Subaddress when a CC-link is being established shall meet the requirements specified in ETSI TS 101 671 V3.12.1 Annex E, Table E.3.4, or ETSI TS 133 108 V15.5.0 Annex J, Table J.2.5. The minimum required number of digits is 5 and the maximum is 8 digits.

b. For the CIN in the IRI-Records according to ETSI TS 101 671 V3.12.1 or ETSI TS 133 108 V15.5.0:

For the format of the CIN conveyed as IRI Parameter `communication-Identity-Number`, ETSI TS 101 671 V3.12.1 Annex D.5 or ETSI TS 133 108 V15.5.0 Annex B.3a apply, with the CIN being encoded as ASCII with a range of 5 up to 8 digits.

c. For the CIN in the IRI-Records according to ETSI TS 102 232-1 V3.19.1:

For the format of the CIN conveyed as IRI Parameter `communicationIdentityNumber`, ETSI TS 102 232-1 V3.19.1 Annex A.2 applies, with the CIN being encoded as integer with a range of 0 up to 4294967295.

6.3.4 CCLID

The CCLID shall not be used, as for multiparty calls option A has to be implemented (ETSI TS 101 671 V3.12.1 Annex A.1.1 and A.5.4.2 or ETSI TS 133 108 V15.5.0 §5.1.3).

6.3.5 Correlation Numbers and Correlation Values

The Correlation Number and Correlation Values are specified in ETSI TS 133 108 V15.5.0 and ETSI TS 133 128 V15.1.0 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 V15.5.0 and ETSI TS 133 128 V15.1.0:

Service	Definition
Packet data domain (UMTS network access)	ETSI TS 133 108 V15.5.0 §6.1.3

Multi-media domain	ETSI TS 133 108 V15.5.0 §7.1.3
Evolved Packet System (EPS and non-3GPP access)	ETSI TS 133 108 V15.5.0 §10.1.3
IMS Conference service	ETSI TS 133 108 V15.5.0 §11.1.4
IMS-based VoIP Services	ETSI TS 133 108 V15.5.0 §12.1.4
NR (5GS and non-3GPP access to 5GS)	ETSI TS 133 128 V15.1.0 §5.5

Table 6-4: ETSI TS 133 108 Services

6.3.6 Timestamp

6.3.6.1 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.

6.3.6.2 Timestamp formats

The format of the timestamps delivered by the CSP may differ depending on the handover interface used to deliver intercepted data to the PTSS. However, UTC time is always possible and the preferred option for PTSS.

For the handover interfaces defined in ETSI TS 101 671 V3.12.1 and ETSI TS 133 108 V15.5.0 the timestamp can be provided either in:

a) Local time: as `GeneralizedTime` with the `winterSummerIndication` parameter.
   or
b) UTC time

For the handover interface defined in ETSI TS 102 232-1 V3.19.1 the timestamp can be provided either as:

a) GeneralizedTime: as UTC time.
   or
b) MicroSecondTimeStamp: with seconds and microseconds, a.k.a UNIX time epoch.

For the handover interface defined in ETSI TS 133 128 V15.1.0 the timestamp shall be provided as UTC time

The timestamp in UTC time and with an accuracy to the millisecond is preferred.

6.3.7 Transmission of identifiers

The identifiers are to be transferred as follows:

1. CC HI3 interface:

For the delivery in the circuit switched domain the identifiers shall be transmitted in the D-Channel (that is, in the D-Channel of the respective CC link of the HI3 interface) when a CC link is established, using a DSS1 SETUP Message, within the Calling Party and Called/Calling Party Subaddress information elements. Subaddress option according to ETSI TS 101 671 V3.12.1 Annex E or ETSI TS 133 108 V15.5.0 Annex J applies.

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 V3.19.1 Annex A.2 or ETSI TS 133 108 V15.5.0 Annex B.

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

6.3.8 FTP file naming and parameters for IRI records delivery

For the HI2 handover interfaces defined in ETSI TS 101 671 V3.12.1 and ETSI TS 133 108 V15.5.0 the IRI records are delivered to the LEMF with the FTP protocol. The sub-sections below specifies the file naming and the necessary parameters to operate the FTP connection.

6.3.8.1 File naming

The composition of the filename is based on the file naming method B according to ETSI TS 101 671 V3.12.1 Annex C.2.2 or ETSI TS 133 108 V15.5.0 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

6.3.8.2 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 6-5: FTP parameters formats

6.3.9 Location information

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

This section describes in general terms 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 6-6: 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 method indicated in the following table.

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 6-7: 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.
Delivering the location information in the way described in this clause obsoletes the delivery of the Cell-ID correlation table as described in section 6.3.9.2.

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 Group the location information shall be delivered via ETSI TS 133 108 V15.5.0 with the ASN.1 module `EpsHI2Operations` using the EPSLocation and the AdditionalCellID 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 6-8: EPS location information with time of location

For 5GS with NR as Master Cell Group and NR or E-UTRA as Secondary Cell Group the location information shall be delivered via ETSI TS 133 128 V15.1.0 with the ASN.1 module TS33128Payloads using either the NRLocation or the EUTRALocation sequence with the following parameters mainly based on 3GPP TS 29.571 V15.4.0 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))
cellSiteInformation	geographicalCoordinates SEQUENCE (NOTE 3) latitude XDDMMSS.SS longitude XDDDMMSS.SS azimuth INTEGER (0..359) (NOTE 4)
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, identical to the gsmLocation parameter. 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 6-9: 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))
cellSiteInformation	geographicalCoordinates SEQUENCE (NOTE 3) latitude XDDMMSS.SS longitude XDDDMMSS.SS azimuth INTEGER (0..359) (NOTE 4)
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, identical to the gsmLocation parameter. 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 6-10: EUTRALocation structure and parameters for 5GS

6.3.9.2 Provisioning of Cell-ID Correlation Tables

This section describes a Swiss proprietary method for the Location Function on Mobile Networks (circuit switched and packet switched domains).
This method derives the geographical Location Information from a CGI or ECGI making use of the so-called "Cell-ID Correlation Table". This method obsoletes the passing of the "real" geographical location information across the handover interface HI2 e.g. GSMLocation or UMTSLocation as defined in 6.3.9.1.

The following contents must be included in the Cell-ID correlation table:

1. Name of operator
2. Date of table delivery
3. Cell Global Identifier (CGI) or E-UTRAN CGI (ECGI) or NR Cell Global Identity (NCGI)
4. Swissgrid CH1903+ coordinates of the antenna locations corresponding to each Cell-ID
5. Direction of the main beam of the antenna corresponding to each Cell-ID: The beam direction angle refers to the mapped 2-dimensional horizontal middle compass angle (in degrees 0-360) of the corresponding cell sector. In case of an umbrella sector, the value –1 must be inserted in this field. When a cell has several main beam directions or when the main beam characteristic is not applicable for the radio access technology, the main beam direction information shall be set to the value -1.
6. Full postal address (if available) of the antenna location corresponding to each Cell-ID

The first row of the table is reserved as follows:

1. Name of operator (1st column)
2. Date of table delivery (2nd column) as follows: ddmmyyyy

Each subsequent row contains a Cell-ID with the corresponding coordinates, beam direction and available postal address as follows:

1. CGI or ECGI or NCGI (1st column)
2. E-Coordinate (east) (2nd column)
3. N-Coordinate (north) (3rd column)
4. Direction of main beam of antenna (4th column)
5. Postal address (if available)

The contents of the table must be saved in CSV (Comma Separated Values) format according to IETF RFC 4180. This format separates columns of data by commas and rows by carriage return.

The filename of the table must have the following format (the prefix CM means “Cell-ID Map”): CM_operatorXY_yyyymmdd.csv
where
<operatorXY> Name of the operator providing the table
<yyyymmdd> Date of table delivery
The following example shows the contents of a Cell-ID correlation table in CSV format, mapping several Cell-IDs:

OperatorXY,20101201,,,
228-0X-56F0-B64B,2600000,1200000,26,Bern Bundesgasse 8
228-0X-57F3-C76A, 2612480, 1176801,45,Autobahn A6 Weststr.km29.750 3600 Thun
228-0X--ABCD123,2585864,1219119,-1,Ringstrasse 10 2560 Port
…

6.3.9.3 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 V15.3.0 for EPS and 3GPP TS 23.501 V15.6.0 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 V15.5.0 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 V15.5.0 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 6-11: 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 V15.5.0 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 V15.5.0 clause 8.100. NOTE 2: The TWAN identifier timestamp provided in case of GTP based S2a interface. Format as in 3GPP TS 29.274 V15.5.0 clause 8.110.		

Table 6-12: Location information structure for Trusted Non-3GPP access to EPS

For Untrusted Non-3GPP access to 5GS the location information shall be delivered in the IRI record via ETSI TS 133 128 V15.1.0 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 IPv4Address OCTET STRING (SIZE(4)) IPv6Address OCTET STRING (SIZE(16))	(NOTE 2)
portNumber	INTEGER	(NOTE 3)
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.		

Table 6-13: Location information structure for Untrusted Non-3GPP access to 5GS

6.3.9.4 Requirements for the Positioning Information in 5GS

This section describes in general terms the requirements for the positioning information in the 5G System. The Positioning Information provides the estimated location of the target UE in geographical coordinates.

In case of a ProvidePosInfo procedure specified in 3GPP TS 29.518 V15.4.0 clause 6.4.6.2.3 or a NotifiedPosInfo procedure specified in 3GPP TS 29.518 V15.4.0 clause 6.4.6.2.4 the positioning information shall be delivered with the following structure and parameters:

PositioningInfo structure in TS33128Payloads module	
Parameter	Format
positionInfo	SEQUENCE
LocationData	SEQUENCE
locationEstimate	GeographicArea CHOICE pointUncertaintyCircle geographicalCoordinates latitude UTF8String

	longitude UTF8String (3GPP TS 29.572 V15.4.0 cl.6.1.6.2.4) Uncertainty INTEGER (0..127) (3GPP TS 29.572 V15.4.0 cl.6.1.6.3.2)
ageOfLocationEstimate	INTEGER (0..32767) (3GPP TS 29.572 V15.4.0 cl.6.1.6.3.2)
positioningDataList	PositioningMethodAndUsage PositioningMethod ENUMERATED cellID eCID oTDOA barometricPresure wLAN bluetooth mBS (3GPP TS 29.572 V15.4.0 cl.6.1.6.3.6) PositioningMode ENUMERATED uEBased uEAssisted conventional (3GPP TS 29.572 V15.4.0 cl.6.1.6.3.7) Usage ENUMERATED unsuccess successResultsNotUsed successResultsUsedToVerifyLocation successResultsUsedToGenerateLocation successMethodNotDetermined (3GPP TS 29.572 V15.4.0 cl.6.1.6.3.9)
gnssPositioningDataList	GNSSPositioningMethodAndUsage PositioningMode ENUMERATED uEBased uEAssisted conventional (3GPP TS 29.572 V15.4.0 cl.6.1.6.3.7) GNSSID ENUMERATED gPS galileo sBAS modernizedGPS qZSS gLONASS (3GPP TS 29.572 V15.4.0 cl.6.1.6.3.8) Usage unsuccess successResultsNotUsed successResultsUsedToVerifyLocation successResultsUsedToGenerateLocation successMethodNotDetermined (3GPP TS 29.572 V15.4.0 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))

Table 6-14: Positioning information structure for 5GS

6.3.10 Access Network Information for IMS-based services

6.3.10.1 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 V15.7.0 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.

6.3.10.2 Access Network Information in IRI records based on ETSI TS 133 108

When IRI records of IMS-based services are delivered based on ETSI TS 133 108 V15.5.0 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.

6.3.10.3 Access Network Information in IRI records based on ETSI TS 102 232

When IRI records of IMS-based services are delivered based on ETSI TS 102 232-1 V3.19.1 the target related "P-Access-Network-Info" header field content shall populate the corresponding values in the `Location` sequence in the delivered IRI records.

6.4 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 Handover interface for the lawful interception of telecommunications traffic

This handover interface may be used for the delivery of the intercepted data related to telephony service in the circuit switched domain, such as PSTN, ISDN, GSM and UMTS.

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
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** FTP is used for IRI data, HI1 notifications and packetised CC such as SMS and UUS (see ETSI TS 101 671 V3.12.1 Annex A.4.2.). ROSE is not allowed. The FTP connection must be closed immediately after data transmission.	See Annex 1 section 6.3.8
11	**Security aspects** For CC over ISDN, CLIP and COLP services are used.	CUG does not need to be implemented.
Annex A: Circuit switched network handover		
A.1.3	**Usage of identifiers** Options “IRI and CC” and “only IRI” option must be supported. Option “only CC” does not need to be implemented.	
A.3.2.1	**Control information for HI2**	

Clause ETSI TS 101 671 V3.12.1	Selection of ETSI options for Switzerland	Additional requirements
	The timestamp must include official local time and related DST indication or UTC time.	See Annex 1 section 6.3.6
A.4.1	**Delivery of Content of Communication** For relating CC data to other H-Interfaces the subaddress service shall be used as specified in ETSI TS 101 671 V3.12.1 Annex E instead of the user-to-user signalling.	As an alternative to the Bearer Capability (BC) of the value “UDI”, the BC can take the value used in the intercepted call, the choice being a CSP option.
A.4.2	**Delivery of packetized Content of Communication** For SMS and UUS Services, CC shall be transferred as IRI. For transferring CC data, the ASN.1 module ‘HI2Operations’ according to ETSI TS 101 671 V3.12.1 Annex D.5 shall be used.	
A.4.3	**Control information for circuit switched Content of Communication** The terminal end point of PTSS replies to a SETUP message immediately with a CONNECT message, i.e. without any ALERTING message.	
A.4.5	**Security requirements at the interface port HI3** ISDN Service specifications CLIP and COLP must be used for creating the CC links to the LEMF.	CUG does not need to be implemented.
A.4.5.3	**Authentication** A special authentication procedure within the ISDN B Channel or within the Subaddress is not used.	
A.5.4	**Multi party calls – general principles** Only option A is available and must be used.	
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	

Clause ETSI TS 101 671 V3.12.1	Selection of ETSI options for Switzerland	Additional requirements
	intact and the signal from the held party shall be switched through.	
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. For relating CC to the other H-Interfaces, Subaddress Service described in ETSI TS 101 671 Annex E must be used. 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 must be used for transferring IRI data over HI2-Interface; ROSE is not allowed.	See point 8.1 in this Table.
C.2.2	**Usage of FTP** For conveying IRI data transmission must be triggered neither by timeout nor by volume. File naming method B must be used. Additionally, section 6.3.8 applies as well.	
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.

Clause ETSI TS 101 671 V3.12.1	Selection of ETSI options for Switzerland	Additional requirements

D.5	`MapDatum ::= ENUMERATED wGS84,`	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** By using FTP for transferring IRI data, the related ROSE operations do not need to be implemented.	The aggregation mechanism for IRI content shall not be used.
Annex E: Use of sub-address and calling party number to carry correlation information		
E.3.2	**Field order and layout** Parameter assignment for CC in accordance to tables E.3.2 and E.3.4 (and the E.3.4 based example in E.3.6) for the Called Party Subaddress and tables E.3.3 and E.3.8 (and the E.3.5 based example in E.3.7) for the Calling Party Subaddress, make provision to correlate CC with IRI according to ETSI TS 101 671 Annex A.1.2.	
Annex I: Evolved Packet System Handover		
I	**Evolved Packet System handover** For Evolved Packet System the Lawful Interception handover interface defined in ETSI TS 133 108 V15.5.0 shall be used.	See Annex 1 section 6.5.2.2

Table 6-15: ETSI TS 101 671 V3.12.1 requirements and options

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

6.5.1.1.1 Conventions for Subaddress encoding for ETSI TS 101 671 V3.12.1

ETSI TS 101 671 V3.12.1 Annexes E.3.1 and E.3.2 define the coding rules for the various parameters contained in Called and Calling Party Subaddress field. The following rules apply:

a) For numeric values the digit 1 shall be the Most Significant Digit (MSD) while digit n shall be the Least Significant Digit (LSD), see ETSI TS 101 671 V3.12.1 Annex E.3.1, last paragraph.
b) All the fields according to ETSI TS 101 671 V3.12.1 Table E.3.2 (refers to Called Party Subaddress) and Table E.3.3 (refers to Calling Party Subaddress) shall be present and appear in the defined order, even if some fields are empty.

c) An empty field shall be indicated by two consecutive Field separators (“FF” hex), see ETSI TS 101 671 V3.12.1 Annex E.3.2, first paragraph underneath Table E.3.2 with the following clarification:
   An “empty field” appears as “empty field consisting of one field separator” (single half-octet). In this case ONE field separator appear after the field separator of the preceding field, followed by the next field, that could take a value or be empty. For a single (isolated) empty field there are two field separators present in total, one is the field separator of the preceding field and the other is for the empty field; for two (consecutive) empty fields there are three field separators present in total, one is the field separator of the preceding field and the remaining are one for each empty field; for three (consecutive) empty fields there are four field separators present in total, etc...
   The format depicted in the figures below illustrates this clarification.
d) The service octets 19 (TMR), 20 (BC octet 3), and 21 (HLC octet 4) shall be present even if a parameter is not available (see note below). In the latter case a value “FF” hex shall be entered.

NOTE: The term “available” refers to the presence of a parameter in the signalling messages, i.e. denotes “when provided” by the function that is subject to interception.

6.5.1.1.2 Format of the Called Party Subaddress Information Element

ETSI TS 101 671 V3.12.1 Table E.3.4 specifies the format of the Called Party Subaddress information element including the Lawful Interception specific parameters to be sent as part of the setup message to LEMF when a CC-link is being established. The format according to ETSI TS 101 671 V3.12.1 Table E.3.4 shall be supported as detailed in this section.

Some of the parameters contained in the Called Party Subaddress are of variable length. Depending on their lengths they appear in different instances of the Called Party Subaddress while keeping the order.

For the LI specific parameters of the Called Party Subaddress ETSI TS 101 671 V3.12.1 Annex E.3 applies with the following clarification:

a) The odd/even indicator defines the number of half-octets up to and including the final Field separator which is either in an odd (final Field separator shall be mapped into bits “4321”) or an even (final Field separator shall be mapped into bits “8765”) position within the half-octet structure. It does not include the spare field, if any, at the end.
b) For parameters with a numeric value that spans more than one half-octet (these are Operator-ID and CIN) the Most Significant Digit (MSD) is the half-octet with the lowest number.

The value to be entered into a spare half-octet is undefined in ETSI TS 101 671 V3.12.1. It shall be set to the value of “0000”. At the receiving side spare shall be ignored, i.e. the message containing the Called Party Subaddress shall not be rejected because a spare bit is set to “1”.

The figure below depicts the format of the Called Party Subaddress for a five digit CIN.

octet	Bit							
	8	7	6	5	4	3	2	1
1	Called party subaddress information element identifier							
	0	1	1	1	0	0	0	1
2	Length of calling party subaddress contents (9 octets in this case)							
	0	0	0	0	1	0	0	1
3	ext.	Type of subaddress			Odd/even	Spare		
	1	0	1	0	0 (even)	0	0	0
4	Operator-ID				Operator-ID (MSD) NOTE			
	0	0	0	0	1	0	0	1
5	Operator-ID				Operator-ID			
	0	0	0	0	0	0	0	0
6	Field separator				Operator-ID (LSD)			
	1	1	1	1	0	0	0	1
7	CIN				CIN (MSD)			
8	CIN				CIN			
9	Field separator				CIN (LSD)			
	1	1	1	1				
10	Field separator or Spare (IIF implementation option)				Field separator			
	1/0	1/0	1/0	1/0	1	1	1	1

Figure 6-1: Called Party Subaddress Information Element ETSI TS 101 671 V3.12.1

NOTE: In this Called Party Subaddress the Operator-ID value is set as an example to „90001“.

The LEMF shall take the parameter “CIN” as the last parameter in the Called Party Subaddress when followed by at least two consecutive Field separators and no further fields other than Field separator or Spare, otherwise the Called Party Subaddress contains a “National parameter” to be treated by LEMF.

6.5.1.1.3 Format of the Calling Party Subaddress Information Element

ETSI TS 101 671 V3.12.1 Table E.3.5 specifies the format of the Calling Party Subaddress information element including the Lawful Interception specific parameters to be sent as part of the setup message to LEMF when a CC-link is being established. The format according to ETSI TS 101 671 V3.12.1 Table E.3.5 shall be supported as detailed in this section.
Some of the parameters contained in the Calling Party Subaddress are of variable length. Depending on their length they appear in different instances of the Calling Party Subaddress while keeping the order.
For the LI specific parameters of the Calling Party Subaddress ETSI TS 101 671 V3.12.1 Annex E.3 applies with the following clarification:

a) The odd/even indicator defines the number of half-octets up to an including the Field separator subsequent to the parameter “Direction” which is either in an odd (Field separator shall be mapped into bits “4321”) or an even (Field separator shall be mapped into bits “8765”) position within the half-octet structure. It does not include the spare field, if any, between the last Field separator and octet 19.

b) For parameters with a numeric value that spans more than one half-octet (this is LIID) the Most Significant Digit (MSD) is the half-octet with the lowest number.
c) The value to be entered into a spare half-octet is undefined in ETSI TS 101 671 V3.12.1. It shall be set to the value of “0000”. At the receiving side spare shall be ignored, i.e. the message containing the Calling Party Subaddress shall not be rejected because a spare bit is set to “1”.
d) Special rules apply to the Service Octets from 19 through 21 as described in section 6.5.1.1.4.
e) Depending on the presence of Mobile Bearer Service Code and Mobile Tele-service Code in signalling messages, information shall be provided in octets 22 and 23 as follows:
    1. If both, Mobile Bearer Service Code and Mobile Teleservice Code are provided by signalling, octets 22 AND 23 shall be present.
    2. If Mobile Bearer Service Code is provided by signalling, and Mo-bile Teleservice Code is NOT provided by signalling, octet 22 shall be present.
    3. If Mobile Teleservice Code is provided by signalling, and Mobile Bearer Service Code is NOT provided by signalling, neither octet 22 nor octet 23 shall be present.
    4. If neither Mobile Teleservice Code nor Mobile Bearer Service Code is provided by signalling, neither octet 22 nor octet 23 shall be present.

The figure below depicts the format of the Calling Party Subaddress (example with the defined 15-digit LIID).

octet	bit							
	8	7	6	5	4	3	2	1
1	Calling party subaddress information element identifier							
	0	1	1	0	1	1	0	1
2	Length of calling party subaddress contents							
	0	0	0	1	0	0	1	1
3	ext.	Type of subaddress			Odd/even	Spare		
	1	0	1	0	1 (odd)	0	0	0
4	LIID <2>				LIID <1> (MSD)			
5	LIID <4>				LIID <3>			
6	LIID <6>				LIID <5>			
7	LIID <8>				LIID <7>			
8	LIID <10>				LIID <9>			
9	LIID <12>				LIID <11>			
10	LIID <14>				LIID <13>			
11	Field separator				LIID<15> (LSD)			
12	Field separator				Direction: CC from Target = 1, CC to Target = 2			
	1	1	1	1	1	1	0/1	0/1
13	Spare				Spare			
18	Spare				Spare			
19	Service Parameter “TMR” according to ITU-T Rec. Q.763 (12/99)§ 3.54							
20	Service Parameter “BC” octet 3 according to ITU-T Rec. Q.931 (05/98) § 4.5.5							
	ext	Coding standard		Information transfer capability				
	1	0	0					
21	Service Parameter “HLC” octet 4 according to ITU-T Rec. Q.931 (05/98) § 4.5.17							
	ext	High layer characteristics identification						
	0/1							
22	Mobile Bearer Service Code according to ETS 300 974 (2000) § 14.7.10							
	Public Land Mobile Network specific Format							
	Format for other Bearer Service Codes							
	unused	group (see ETS 300 974(2000) § 14.7.10)				rate (see ETS 300 974 (2000) § 14.7.10)		
	0							
23	Mobile Teleservice Code according to ETS 300 974 (2000) § 14.7.9							
	group (see ETS 300 974 (2000) § 14.7.9)				specific service (see ETS 300 974 (2000) § 14.7.9)			

Figure 6-2 Calling Party Subaddress Information Element ETSI TS 101 671 V3.12.1

The Bearer Service Code allows two formats, the choice being a CSP option:

a) the PLMN-specific bearer services, individually defined by each Home Public Land Mobile Network Operator, with codepoint for bits “4321” from 0 through F (Hex) with leading bits “8765” equal to “1101”, see ETSI ETS 300 974 (2000) ASN.1 encoding BearerServiceCode set from allPLMN-specificBS through plmn-specificBS-F.

b) the „rest“ of bearer services with the structure and codepoints defined in ETSI ETS 300 974 (2000) ASN.1 encoding BearerServiceCode.

The Teleservice Code allows two formats, the choice being a CSP option:
a) the PLMN-specific teleservices, individually defined by each Home Public Land Mobile Network Operator, with codepoint for bits “4321” from 0 through F (Hex) with leading bits “8765” indicating the group PLMN “1101”, see ETSI ETS 300 974 (2000) ASN.1 encoding TeleserviceCode set from allPLMN-specificTS through plmn-specificTS-F.
b) the „rest“ of bearer services with the codepoints for bits „87654321“ defined in ETSI ETS 300 974 (2000) ASN.1 encoding TeleserviceCode.

6.5.1.1.4 Service octets for fix networks

For Fix networks the Calling Party Subaddress contains three parameters that allow identifying the profile of the Content of Communication of the intercepted call. These are:
- Octet 19: The parameter Transmission Medium Requirement (TMR), see ETSI TS 101 671 V3.12.1 Table E.3.5.
- Octet 20: The parameter Bearer Capability (BC), see ETSI TS 101 671 V3.12.1 Table E.3.5.
- Octet 21: The parameter High Layer Compatibility (HLC), see ETSI TS 101 671 V3.12.1 Table E.3.5.

ITU-T Recommendation Q.699 specifies how, among others, analog signalling, the information elements of DSS1 SETUP, and parameters of ISUP IAM (Initial Address Message) are to be used in specific call scenarios.
The service information available in principle at the switch where the IIF resides depends on the connection from the calling party (target or third party) to the IIF which could be either ISDN or non-ISDN:
a) For ISDN, ITU-T Q.699 (09/97) § 2.1.1.1, in particular Table 1 in ITU-T Q.699 (09/97) (for TMR), Table 3 in ITU-T Q.699 (09/97) (for User Service Information parameter, USI) and Table 6 in ITU-T Q.699 (09/97) (for User Teleservice Information parameter, UTI) applies.
b) For non-ISDN, including third calling ISDN with intermediate interworking, ITU-T Q.699 (09/97) § 2.2.1.1 applies. In relation to TMR, the value is 3.1 kHz audio. Neither the USI nor the UTI are present.

The following table describes the availability of service information within the switch where the IIF resides for various call scenarios in terms of ISUP parameters (TMR, USI, UTI), and defines the mapping of information contained in the ISUP parameters TMR, USI and UTI into the Calling Party Subaddress to be done by the IIF. It should be noted that the information on the service profile that is provided by the calling party, which could be the target or a third party, and is passed via signalling to the IIF is mainly relevant for the contents of octets 19, 20 and 21 in the Calling Party Subaddress.

In the case that an analogue target terminates a call, there are implementation options as follows, the choice being a CSP option:
- Option a.: All parameters available in the switch where the IIF resides are mapped into the octets 19 (TMR), 20 (USI), and 21 (UTI) of the Calling Party Subaddress.
- Option b.: Only TMR is mapped into the octet 19 of the Calling Party Subaddress, while 20 (USI), and 21 (UTI) are set to “FF” (hex).

- Option c.: The octets 19 (TMR), 20 (USI), and 21 (UTI) of the Calling Party Subaddress are set to “FF” (hex).

The IIF shall meet the requirements specified in the following table:

		ISUP parameters according to ITU-T Q.699 (09/97)			**Parameters according to ETSI TS 101 671 V3.12.1 Table E.3.5**		
Calling	**Called**	**ISUP Transmission Medium Requirement ITU-T Q.763 (12/99) § 3.54**	**ISUP User Service Information octet 1 ITU-T Q.763 (12/99) § 3.57 (coding see ITU-T Q.931 (05/98) § 4.5.5 octet 3)**	**ISUP User Teleservice Information octet 2 ITU-T Q.763 (12/99) § 3.59 (coding see ITU-T Q.931 (05/98) § 4.5.17 octet 4)**	**Service Parameter octet 19 (value “TMR”)**	**Service Parameter octet 20 (value “BC” octet 3)**	**Service Parameter octet 21 (value “HLC” octet 4)**
Target ISDN	Third any	speech	speech	not present or telephony	speech or “FF” hex (NOTE 1)	speech	“FF” hex or telephony (NOTE 2)
		64 kbit/s unrestricted	unrestricted digital information	not present or value matching BC	UDI or “FF” hex (Note 1)	unrestricted digital information	“FF” hex or value matching BC (NOTE 2)
		3.1 kHz audio	3.1 kHz audio	not present or value matching BC	3.1 kHz audio or “FF” hex (NOTE 1)	3.1 kHz audio	“FF” hex or value matching BC (NOTE 2)
Target analog	Third any	3.1 kHz audio	not present	not present	3.1 kHz audio	“FF” hex	“FF” hex
Third ISDN	Target ISDN	speech	speech	not present or telephony	speech or “FF” hex (NOTE 1)	speech	“FF” hex or telephony (NOTE 2)
		64 kbit/s unrestricted	unrestricted digital information	not present or value matching BC	UDI or “FF” hex (NOTE 1)	unrestricted digital information	“FF” hex or value matching BC (NOTE 2)
		3.1 kHz audio	3.1 kHz audio	not present or value matching BC	3.1 kHz audio or “FF” hex (NOTE 1)	3.1 kHz audio	“FF” hex or value matching BC (NOTE 2)
Third ISDN	Target analog	speech	speech	not present or telephony	OPTION a.: speech or “FF” hex (NOTE 1)	OPTION a.: speech	OPTION a.: “FF” hex or telephony (NOTE 2)
					OPTION b.: speech	OPTION b.: “FF” hex	OPTION b.: “FF” hex
					OPTION c.: “FF” hex	OPTION c.: “FF” hex	OPTION c.: “FF” hex
		64 kbit/s unrestricted	unrestricted digital information	not present or value matching BC	No communication between third party and Target takes place with this service profile, since the user destination “analog” is incompatible to the service profile of the offered call. No CC-links are established using this profile, but IRI is sent.		

		ISUP parameters according to ITU-T Q.699 (09/97)			Parameters according to ETSI TS 101 671 V3.12.1 Table E.3.5		
Calling	**Called**	**ISUP Transmission Medium Requirement ITU-T Q.763 (12/99) § 3.54**	**ISUP User Service Information octet 1 ITU-T Q.763 (12/99) § 3.57 (coding see ITU-T Q.931 (05/98) § 4.5.5 octet 3)**	**ISUP User Teleservice Information octet 2 ITU-T Q.763 (12/99) § 3.59 (coding see ITU-T Q.931 (05/98) § 4.5.17 octet 4)**	**Service Parameter octet 19 (value "TMR")**	**Service Parameter octet 20 (value "BC" octet 3)**	**Service Parameter octet 21 (value "HLC" octet 4)**
		3.1 kHz audio	3.1 kHz audio	not present or value matching BC	OPTION a.: 3.1 kHz audio or "FF" hex (NOTE 1)	OPTION a.: 3.1 kHz audio	OPTION a.: "FF" hex or value matching BC (NOTE 2)
					OPTION b.: 3.1 kHz audio	OPTION b.: "FF" hex	OPTION b.: "FF" hex
					OPTION c.: "FF" hex	OPTION c.: "FF" hex	OPTION c.: "FF" hex
Third analog or Inter-working	Target ISDN	3.1 kHz audio	not present	not present	3.1 kHz audio	"FF" hex	"FF" hex
Third analog or Inter-working	Target analog	3.1 kHz audio	not present	not present	OPTION a.: 3.1 kHz audio	OPTION a.: "FF" hex	OPTION a.: "FF" hex
					OPTION b.: 3.1 kHz audio	OPTION b.: "FF" hex	OPTION b.: "FF" hex
					OPTION c.: "FF" hex	OPTION c.: "FF" hex	OPTION c.: "FF" hex

Table 6-16: Mapping of TMR, USI and UTI at IIF into Calling Party Subaddress service

NOTE 1: Service Parameter octet 19 allows IIF an implementation option in situations where the information is contained in octet 20 thereby LEMF may ignore octet 19.

NOTE 2: Service Parameter octet 21 may deliver "FF" hex, if the optional HLC has not been provided by the calling user.

6.5.2 ETSI TS 133 108 Handover interface for Lawful Interception

The handover interface specifications of ETSI TS 133 108 V15.5.0 are based on the description from the specification ETSI TS 133 107 V15.6.0 Lawful interception architecture and functions.

This handover interface is composed of two main parts.
The first part may be used for the delivery of the intercepted data related to telephony service in the circuit switched domain, such as GSM and UMTS telephony. The section 6.5.2.1 specifies the requirements and options.
The second part 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 Conference Services. The section 6.5.2.2 specifies the requirements and options.

6.5.2.1 ETSI TS 133 108 V15.5.0 requirements and options for the circuit switched domain

Clause ETSI TS 133 108 V15.5.0	Selection of ETSI options for Switzerland	Additional requirements
4.3	**Functional requirements** Options “IRI and CC” and “only IRI” option must be supported. Option “only CC” does not need to be implemented.	
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 4
4.5.1	**Data transmission protocol** FTP is used for IRI data. The FTP connection must be closed immediately after data transmission.	See Annex 1 section 6.3.8
Chapter 5: Circuit-switched domain		
5.1.2.1	**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
5.2.2.1	**Control information for HI2** The timestamp must include official local time and related DST indication or UTC time	
5.3.1	**Delivery of Content of Communication** For relating CC data to other H-Interfaces the subaddress service shall be used as specified in ETSI TS 133 108 V15.5.0 Annex J.2 instead of the user-to-user signalling. For SMS and UUS Services, CC shall be transferred as IRI. The provider must remove any encryption algorithm applied by the	

Clause ETSI TS 133 108 V15.5.0	Selection of ETSI options for Switzerland	Additional requirements
	CSP internally in the network at the handover interface.	
5.3.2	**Control information for circuit switched Content of Communication** The terminal end point of PTSS replies to a SETUP message immediately with a CONNECT message, i.e. without any ALERTING message.	
5.3.3	**Security requirements at the interface port HI3** ISDN Service specifications CLIP and COLP must be used for creating CC links to PTSS.	CUG does not need to be implemented.
5.3.3.3	**Authentication** A special authentication procedure within the ISDN B Channel or within the Subaddress is not used.	
5.4.4 5.5.2, 5.5.3, 5.5.11	**Multi party calls – general principles** Only option A is available and must be used.	
5.5.12.1.1	**Call Diversion by target, CC links** For CFNR, UDUB, CD and partial rerouting, option 2 (with CONTINUE-Record) must be implemented.	
5.5.3	**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 133 108 V15.5.0 §5.5.3.1 applies. CC links shall stay intact and the signal from the held party shall be switched through.	
5.5.4.1	**Explicit Call Transfer (ECT)** For explicit call transfer, Option 2 must be implemented. This means, that the transferred call must not be intercepted.	
5.5.15	**User-to-User Signalling (UUS)** UUS service data shall be delivered as IRI data.	See points 5.3.1 in this Table.
Annex A: HI2 delivery mechanisms and procedures		
A	**ROSE/FTP**	

Clause ETSI TS 133 108 V15.5.0	Selection of ETSI options for Switzerland	Additional requirements
	FTP must be used for transferring IRI data over HI2-interface; ROSE is not allowed.	
A.2	**Usage of FTP for conveying IRI data**. File naming method B must be used according to section 6.3.8	The aggregation mechanism for IRI content shall not be used.
Annex B: Structure of data at the handover interface		
B.3	`MapDatum ::= ENUMERATED` `wGS84,`	
Annex J: Use of sub-address and calling party number to carry correlation information		
J.2.3	**Field order and layout** Parameter assignment for CC in accordance to tables J.2.3. and J.2.5 (and the J.2.5 based example in table J.2.4A) for the Called Party Subaddress and tables J.2.4 and J.2.6 for the Calling Party Subaddress, make provision to correlate CC with IRI according to ETSI TS 133 108V15.5.0 Annex J.2.	

Table 6-17: ETSI TS 133 108 V15.5.0 requirements and options for the circuit switched domain

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

6.5.2.1.1 Conventions for Subaddress encoding for ETSI TS 133 108 V15.5.0

ETSI TS 133 108 V15.5.0 Annexes J.2.3.1, J.2.3.2 define the coding rules for the various parameters contained in Called and Calling Party Subaddress field. The following rules apply:

a) For numeric values the digit 1 shall be the Most Significant Digit (MSD) while digit n shall be the Least Significant Digit (LSD), see ETSI TS 133 108 V15.5.0 Annex J.2.3.1, last paragraph.
b) All the fields according to ETSI TS 133 108 V15.5.0 Table J.2.3 (refers to Called Party Subaddress) and Table J.2.4 (refers to Calling Party Subaddress) shall be present and appear in the defined order, even if some fields are empty.
c) An empty field shall be indicated by two consecutive Field separators (“FF” hex), see ETSI TS 133 108 V15.5.0 Annex J.2.3.2, first paragraph underneath Table J.2.3 with the following clarification:

   An “empty field” appears as “empty field consisting of one field separator” (single half-octet). In this case ONE field separator appears after the field separator of the preceding field, followed by the next field, that could take a value or be empty. For a single (isolated) empty field there are two field separators present in total, one is the field separator of the preceding field and the other is for the empty field; for two (consecutive) empty fields there are three field separators present in total, one is the field separator of

the preceding field and the remaining are one for each empty field; for three (consecutive) empty fields there are four field separators present in total, etc...
The format depicted in the figures below illustrates this clarification.

d) The service octets 19 (TMR), 20 (BC octet 3), and 21 (HLC octet 4) shall be present even if a parameter is not available (see note below). In the latter case a value “FF” hex shall be entered.

NOTE: The term “available” refers to the presence of a parameter in the signalling messages, i.e. it denotes “when provided” by the function that is subject to interception.

6.5.2.1.2 Format of the Called Party Subaddress Information Element

ETSI TS 133 108 V15.5.0 Table J.2.5 specifies the format of the Called Party Subaddress information element including the Lawful Interception specific parameters to be sent as part of the setup message to the LEMF when a CC-link is being established. The format according to ETSI TS 133 108 V15.5.0 Table J.2.5 shall be supported as detailed in this section.
Some of the parameters contained in the Called Party Subaddress are of variable length. Depending on their length they appear in different instances of the Called Party Subaddress while retaining the order.

For the LI specific parameters of the Called Party Subaddress ETSI TS 133 108 V15.5.0 Annex J.2.3 applies with the following clarification:

a) The odd/even indicator defines the number of half-octets up to and including the final Field separator which is either in an odd (final Field separator shall be mapped into bits “4321”) or an even (final Field separator shall be mapped into bits “8765”) position within the half-octet structure. It does not include the spare field, if any, at the end.
b) For parameters with a numeric value that spans more than one half-octet (these are Operator-ID and CIN) the Most Significant Digit (MSD) is the half-octet with the lowest number.
c) The value to be entered into a spare half-octet is undefined in ETSI TS 133 108 V15.5.0. It shall be set the value of “0000”. At the receiving side spare shall be ignored, i.e. the message containing the Called Party Subaddress shall not be rejected because a spare bit is set to “1”.

The figure below depicts the format of the Called Party Subaddress for a five digit CIN.

octet	bit							
	8	7	6	5	4	3	2	1
1	Called party subaddress information element identifier							
	0	1	1	1	0	0	0	1
2	Length of calling party subaddress contents (9 octets in this case)							
	0	0	0	0	1	0	0	1
3	ext.	Type of subaddress			Odd/even	Spare		
	1	0	1	0	0 (even)	0	0	0
4	Operator-ID				Operator-ID (MSD) NOTE			
	0	0	0	0	1	0	0	1
5	Operator-ID				Operator-ID			
	0	0	0	0	0	0	0	0
6	Field separator				Operator-ID (LSD)			
	1	1	1	1	0	0	0	1
7	CIN				CIN (MSD)			
8	CIN				CIN			
9	Field separator				CIN (LSD)			
	1	1	1	1				
10	Field separator or Spare (IIF implementation option)				Field separator			
	1/0	1/0	1/0	1/0	1	1	1	1

Figure 6-3: Called Party Subaddress Information Element ETSI TS 133 108 V15.5.0

NOTE: In this Called Party Subaddress the Operator-ID value is set as an example to „90001“.

The LEMF shall take the parameter “CIN” as the last parameter in the Called Party Subaddress when followed by at least two consecutive Field separators and no further fields other than Field separator or Spare, otherwise the Called Party Subaddress contains a “National parameter” to be treated by the LEMF.

6.5.2.1.3 Format of the Calling Party Subaddress Information Element

ETSI TS 133 108 V15.5.0 Table J.2.6 specifies the format of the Calling Party Subaddress information element including the Lawful Interception specific parameters to be sent as part of the setup message to the LEMF when a CC-link is being established. The format according to ETSI TS 133 108 V15.5.0 Table J.2.6 shall be supported as detailed in this section.
Some of the parameters contained in the Calling Party Subaddress are of variable length. Depending on their length they appear in different instances of the Calling Party Subaddress while keeping the order.
For the LI specific parameters of the Calling Party Subaddress ETSI TS 133 108 V15.5.0 Annex J.2.3 applies with the following clarification:

a) The odd/even indicator defines the number of half-octets up to an including the Field separator subsequent to the parameter “Direction” which is either in an odd (Field separator shall be mapped into bits “4321”) or an even (Field separator shall be mapped into bits “8765”) position within the half-octet structure. It does not include the spare field, if any, between the last Field separator and octet 19.

b) For parameters with a numeric value that spans more than one half-octet (this is LIID) the Most Significant Digit (MSD) is the half-octet with the lowest number.
c) The value to be entered into a spare half-octet is undefined in ETSI TS 133 108 V15.5.0. It shall be set to the value of “0000”. At the receiving side spare shall be ignored, i.e. the message containing the Calling Party Subaddress shall not be rejected because a spare bit is set to “1”.
d) Depending on the presence of Mobile Bearer Service Code and Mobile Tele-service Code in signalling messages, information shall be provided in octets 22 and 23 as follows:
    1. If both, Mobile Bearer Service Code and Mobile Teleservice Code are provided by signalling, octets 22 AND 23 shall be present.
    2. If Mobile Bearer Service Code is provided by signalling, and Mobile Teleservice Code is NOT provided by signalling, octet 22 shall be present.
    3. If Mobile Teleservice Code is provided by signalling, and Mobile Bearer Service Code is NOT provided by signalling, neither octet 22 nor octet 23 shall be present.
    4. If neither Mobile Teleservice Code nor Mobile Bearer Service Code is provided by signalling, neither octet 22 nor octet 23 shall be present.

The figure below depicts the format of the Calling Party Subaddress (example with 15-digit LIID).

octet	bit							
	8	7	6	5	4	3	2	1
1	Calling party subaddress information element identifier							
	0	1	1	0	1	1	0	1
2	Length of calling party subaddress contents							
	0	0	0	1	0	0	1	1
3	ext.	Type of subaddress			Odd/even	Spare		
	1	0	1	0	1 (odd)	0	0	0
4	LIID <2>				LIID <1> (MSD)			
5	LIID <4>				LIID <3>			
6	LIID <6>				LIID <5>			
7	LIID <8>				LIID <7>			
8	LIID <10>				LIID <9>			
9	LIID <12>				LIID <11>			
10	LIID <14>				LIID <13>			
11	Field separator				LIID <15> (LSD			
12	Field separator				Direction: CC from Target = 1, CC to Target = 2			
	1	1	1	1	1	1	1/0	0/1
13	Spare				Spare			
18	Spare				Spare			
19	Service Parameter “TMR” according to ITU-T Rec. Q.763 (12/99) § 3.54							
20	Service Parameter “BC” octet 3 according to ITU-T Rec. Q.931 (05/98) § 4.5.5							
	ext	Coding standard		Information transfer capability				
	1	0	0					
21	Service Parameter “HLC” octet 4 according to ITU-T Rec. Q.931 (05/98) § 4.5.17							
	ext	High layer characteristics identification						
	0/1							
22	Mobile Bearer Service Code according to ETSI TS 129 002 V4.18.0 § 17.7.10							
	Public Land Mobile Network specific Format							
	Format for other Bearer Service Codes							
	unused	group (see ETSI TS 129 002 V4.18.0 § 17.7.10)				rate (see ETSI TS 129 002 V4.18.0 § 17.7.10)		
	0							
23	Mobile Teleservice Code according to ETSI TS 129 002 § 17.7.9							
	group (see ETSI TS 129 002 V4.18.0 § 17.7.9)				specific service (see ETSI TS 129 002 V4.18.0 § 17.7.9)			

Figure 6-4: Calling Party Subaddress Information Element ETSI TS 133 108 V15.5.0

The Bearer Service Code allows two formats, the choice being a CSP option:

a) the PLMN-specific bearer services, individually defined by each Home Public Land Mobile Network Operator, with codepoint for bits “4321” from 0 through F (Hex) with

leading bits “8765” equal to “1101”, see ETSI TS 129 002 V4.18.0 ASN.1 encoding BearerServiceCode set from allPLMN-specificBS through plmn-specificBS-F.

b) the „rest“ of bearer services with the structure and codepoints defined in ETSI TS 129 002 V4.18.0 ASN.1 encoding BearerServiceCode.

The Teleservice Code allows two formats, the choice being a CSP option:

a) the PLMN-specific teleservices, individually defined by each Home Public Land Mobile Network Operator, with codepoint for bits “4321” from 0 through F (Hex) with leading bits “8765” indicating the group PLMN “1101”, see ETSI TS 129 002 V4.18.0 ASN.1 encoding TeleserviceCode set from allPLMN-specificTS through plmn-specificTS-F.

b) the „rest“ of bearer services with the codepoints for bits „87654321“ defined in ETSI TS 129 002 V4.18.0 ASN.1 encoding TeleserviceCode.

6.5.2.2 ETSI TS 133 108 V15.5.0 requirements and options for the packet switched domain

Clause ETSI TS 133 108 V15.5.0	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
4.5	**HI2: Interface port for Interception Related Information** 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 6.3.8
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** Record shall be triggered:	

Clause ETSI TS 133 108 V15.5.0	Selection of ETSI options for Switzerland	Additional requirements
	- when the SGSN receives the SMS-MO from the target MS. - when the SGSN receives the SMS-MT from the SMS-Centre	
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. 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	

Clause ETSI TS 133 108 V15.5.0	Selection of ETSI options for Switzerland	Additional requirements
	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`" 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.	CSP and PTSS may agree to use proprietary SIP header fields in order to help identify the target identity.
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 V15.3.0.
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	**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 6.3.9.3.	The location information for the secondary RAT (PSCell) is described in the present document in section 6.3.9.1.
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**	

Clause ETSI TS 133 108 V15.5.0	Selection of ETSI options for Switzerland	Additional requirements
	As mentioned in ETSI TS 133 108 V15.5.0 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 V15.5.0 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. The `VoIPRoamingIndication` parameter shall be set to `roamingS8HR` in the IRI record. The ICE-type in the CC data shall be set to "`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	

Clause ETSI TS 133 108 V15.5.0	Selection of ETSI options for Switzerland	Additional requirements
	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** 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.	The ETSI TS 133 108 V15.5.0 clause 14.2.7 mentions the Annex B.11.2, however, it has been replaced by Annex B.14.2.
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.	
16. Cell Site Reporting		
16.1	The cell site information is implemented directly in the IRI record that contain a cell identifier. The Cell	

Clause ETSI TS 133 108 V15.5.0	Selection of ETSI options for Switzerland	Additional requirements
	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`.	
17.4	**PTC Communication Content (CC)** For Non-VoIP PTC Communication Content the PTC ULIC header is not yet defined in the release of ETSI TS 133 108 V15.5.0.	Non-VoIP PTC CC shall not be delivered to the LEMF. This will only be possible when the PTC ULIC header will be specified in a next release.
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.	
Annex A: HI2 delivery mechanisms and procedures		
A	**ROSE/FTP** FTP must be used for transferring IRI data over HI2 interface; ROSE is not allowed.	
A.2.2	**Usage of FTP for conveying IRI data** File naming method B must be used.	
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**	

Clause ETSI TS 133 108 V15.5.0	Selection of ETSI options for Switzerland	Additional requirements
	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.	
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.	

Table 6-18: ETSI TS 133 108 V15.5.0 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 V3.19.1 Handover specification for IP delivery

Clause ETSI TS 102 232-1 V3.19.1	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.	

Clause ETSI TS 102 232-1 V3.19.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
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.	
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 "networkElemen-tIdentifier" must be provided.
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 cases 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.	
6.2.2	**Error reporting** `OperatorLeaMessage` specified in ETSI TS 102 232-1 V3.19.1 Annex A.2 must be used.	Related NID must be mentioned in the Transport Related Information (TRI) message.
6.2.3	**Aggregation of payloads** Aggregation of payload shall not be used.	
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.

Clause ETSI TS 102 232-1 V3.19.1	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 on a bilateral basis to each CSP.	PTSS provides a specific port number for each service specification TS 102 232-2 V3.9.1, TS 102 232-3 V3.3.1, TS 102 232-5 V3.5.1 and TS 102 232-6 V3.3.1 and TS 133 128 V15.1.0. The port number can be different for each service.
7.2	**Security requirements**	Neither TLS, nor signatures, nor hash codes must be used.
7.3.2	**Timeliness**	The possible use of separate managed networks must be agreed with PTSS.
A.2	**ASN.1 specification** 5GC NR lawful interception IRI and CC records specified in ETSI TS 133 128 V15.1.0 are delivered via the parameters `threeGPP33128DefinedIRI` and `threeGPP33128DefinedCC` as specified in ETSI TS 102 232-7 V3.6.1 clause 15. See details in section 6.5.8.	The delivery of the IRI and CC records specified in ETSI TS 133 128 V15.1.0 necessitates the use of the ASN.1 module `LI-PS-PDU` version 29 or a higher version.

Table 6-19: ETSI TS 102 232-1 V3.19.1 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 V3.11.1 Service-specific details for messaging services

Clause ETSI TS 102 232-2 V3.11.1	Available options for Swiss applications	Additional requirements or specifications
6.2.3	**Email send IRI** 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 V3.11.1	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 6-20: ETSI TS 102 232-2 V3.11.1 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 V3.11.1 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. The multiple PDUs shall all be identical apart from the payload content itself and the sequenceNumber which must be incremented by one for each PDU delivered. Fragmented emails must be delivered 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 6-21: ETSI TS 102 232-2 V3.11.1 parameters quick reference table

6.5.5 ETSI TS 102 232-3 V3.7.1 Service-specific details for internet access services

Clause ETSI TS 102 232-3 V3.7.1	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 events and HI2 attributes from ETSI TS 102 232-3 version 1.4.1 and onwards shall be used.	In version 1.4.1 the event 'startOfInterceptionWithSessionActive' was added.

Table 6-22: ETSI TS 102 232-3 V3.7.1 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 V3.11.1 Service-specific details for IP Multimedia Services

Clause ETSI TS 102 232-5 V3.11.1	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.	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).
	5) IRI data that is not part of the signal must be transferred as well.	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 V3.19.1 Annex A.2
	6) No national option is mandated.	

Clause ETSI TS 102 232-5 V3.11.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
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.	
5.3	**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.
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.
5.5	**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 V3.11.1	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 V3.19.1. The parameters `combined` and not `notapplicable` shall not be used.	

Table 6-23: ETSI TS 102 232-5 V3.11.1 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 V3.3.1 Service-specific details for PSTN/ISDN services

Clause ETSI TS 102 232-6	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 V3.19.1 Annex A.2 via the parameter ETSI671IRI.	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 V3.19.1 `LI-PS-PDU PSHeader` sequence

Clause ETSI TS 102 232-6	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 V3.19.1 via the parameter PstnIsdnCC. The information required for interpreting the audioFrame or RTP packets are also transferred by ETSI TS 102 232-1 V3.19.1 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.	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** G.711 (11/88) A-law is the default, and preferred codec (mediaAttributes = "8").	

Table 6-24: ETSI TS 102 232-6 V3.3.1 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 V3.6.1 Service-specific details for Mobile Services

This technical specification uses the handover techniques and ASN.1 syntax defined in ETSI TS 102 232-1 V3.19.1.

Clause ETSI TS 102 232-7 V3.6.1	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 V15.1.0	See details in section 6.5.9.

Clause ETSI TS 102 232-7 V3.6.1	Selection of ETSI options for Swiss applications	Additional requirements or specifications
15.2	**IRI and CC format** ETSI TS 133 128 V15.1.0 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 V3.19.1 in section 6.5.3.

Table 6-25: ETSI TS 102 232-7 V3.6.1 Service-specific details for Mobile Services

6.5.9 ETSI TS 133 128 V15.1.0 Protocol and procedures for Lawful Interception for 5G System

The handover interface specifications of ETSI TS 133 128 V15.1.0 are based on the description from the specification ETSI TS 133 127 V15.2.0 Lawful interception architecture and functions for the 5G System.

The architecture and concepts of the 5G System are specified in 3GPP TS 23.501 V15.6.0 and the procedures in 3GPP TS 23.502 V15.6.0. The security architecture and procedures are specified in 3GPP TS 33.501 V15.5.0.

This handover interfaces for the 3GPP-defined services provided by the 5G System uses the transport mechanisms specified in ETSI TS 102 232-1 V3.19.1 and ETSI TS 102 232-7 V3.6.1. See details in the sections 6.5.3 and 6.5.8.

Note: The specification ETSI TS 133 128 V15.1.0 specifies the protocols and messages of the CSP internal interfaces.

Clause ETSI TS 133 128 V15.1.0	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 LI_SI, LI_X1, LI_X2, LI_X_3, LI_T2, LI_T3, LI_ADMF and LI_MDF are under 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 V1.3.1 with the new 5GS identifiers.	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.

Clause ETSI TS 133 128 V15.1.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
5. Transport and Communications Protocol		
5.2	**Protocols for LI_X1 and LI_T interfaces** These internal interfaces are under control of the CSP and the pprotocols 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 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 V1.3.1.	For the requirements of ETSI TS 103 120 V1.3.1 refer to the present document in sections 4.2.2, 4.2.3 and 4.3.3.
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 V3.19.1 and ETSI TS 102 232-7 V3.6.1.	For the requirements of ETSI TS 102 232 V3.19.1 and ETSI TS 102 232-7 V3.6.1 refer to the present document in sections 6.5.3 and 6.5.8.
5.6	**Protocols for LI_HI4** The functions having LI_HI4 interface shall support the use of ETSI TS 102 232-1 V3.19.1. It makes use of the `operatorLeaMessage` parameter in the TRI payload of the `LI-PS-PDU` module. The `OperatorLeaMessagePriority` shall be set to `informational`.	Only the Activation and Deactivation events shall be delivered by the CSP.
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.		
6.2.2.2.4	**Location update** In Table 6.2.2-3 for the field name location under 3) the `locationPresenceReport` is not required.	
6.2.2.3	**Generation of IRI over LI_HI2** 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.	
6.2.3.3.1	**LI_T3 interface specifics** Service scoping of CC is not used in the instructions in Switzerland.	

Clause ETSI TS 133 128 V15.1.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
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.	
6.2.3.5.1 6.2.3.5.3 6.2.3.5.4 6.2.3.9	**Packet data header reporting** Packet Data Header Reports (PDHR) and Packet Data Header Summary Reports (PDSR) are not required.	
6.2.5.3	**SMS Message** In Table 6.2.5.1 for `sMSTPDUData` and NOTE 8: the CC can be removed for interception types that do not require the content of communication.	
6.2.5.4	**Generation of IRI over LI_HI2** For interception types that do not require the CC when the internal xIRI message contains the content of communication in the `sMSTPDUData`, the content can be removed by the MDF2 before the delivery of the external IRI record.	
7. Service Layer Based Interception		
7.2.2.3.2	**Serving system** If the target is registered simultaneously in the same PLMN with 3GPP and Non-3GPP access, two different IRI records shall be delivered, one for each type of access. If the target supports Multi-Access an inbound roamer can be registered simultaneously into two different PLMN with different accesses, two different IRI records shall be delivered, one for each PLMN. This information is delivered with the `UDMServingSystemMessage` sequence.	
7.3.1	**Lawful Access Location Services (LALS)** LALS via Location Services (LCS) is not required in Switzerland.	

Clause ETSI TS 133 128 V15.1.0	Selection of ETSI options for Swiss applications	Additional requirements or specifications
7.3.2.2	**Generation Cell Site Report IRI over LI_HI2** If the MDF2 complement all the IRI messages containing a 3GPP access location with the cell site information (geographical coordinates and azimuth), then the delivery of `MDFCellSiteReport` message is not required.	
Annex A	**Structure of both the Internal and External Interfaces** The applicable ASN.1 `TS33128Payloads` module version is specified in the section 6.6.	

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`
	`deliveryInformation`: 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.	

Table 6-26: ETSI TS 133 128 V15.1.0 Protocol and procedures for Lawful Interception for 5GS

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 V1.10.1	Technical specifications
ETSI TS 101 671 Circuit-switched domain (section 6.5.1.1)		
HI1NotificationOperations	{0.4.0.2.2.0.1.6}	ETSI TS 101 671 V3.10.1 to ETSI TS 101 671-1 V3.12.1
HI2Operations	{0.4.0.2.2.1.16} to {0.4.0.2.2.1.18}	ETSI TS 101 671-1 V3.10.1 to ETSI TS 101 671-1 V3.12.1
ETSI TS 133.108 UMTS Circuit-switched domain (section 6.5.2.1)		
UmtsCS-HI2Operations	{0.4.0.2.2.4.3.13.2} to {0.4.0.2.2.4.3.15.1}	ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V15.5.0
ETSI TS 133.108 Packet-switched domain (section 6.5.2.2)		
Umts-HI3-PS	{0.4.0.2.2.4.2.7.0}	ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V15.5.0
EpsHI2Operations	{0.4.0.2.2.4.8.13.3} to {0.4.0.2.2.4.8.15.4}	ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V15.5.0
Eps-HI3-PS	{0.4.0.2.2.4.9.12.0}	ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V15.5.0
CONFHI2Operations	{0.4.0.2.2.4.10.13.0}	ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V15.5.0
CONF-HI3-IMS	{0.4.0.2.2.4.11.13.0}	ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V15.5.0
VoIP-HI3-IMS	{0.4.0.2.2.4.12.13.0} to {0.4.0.2.2.4.12.14.1}	ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V15.5.0
GCSEHI2Operations	{0.4.0.2.2.4.13.15.0}	ETSI TS 133 108 V15.5.0
GCSE-HI3	{0.4.0.2.2.4.14.13.0}	ETSI TS 133 108 V15.5.0
ProSeHI2Operations	{0.4.0.2.2.4.15.13.0}	ETSI TS 133 108 V15.5.0
ETSI TS 133 128 5G System (section 6.5.9)		
TS33128Payloads	{0.4.0.2.2.4.19.15.1}	ETSI TS 133 128 V15.1.0
ETSI TS 102 232-1 (section 6.5.3)		
LI-PS-PDU (Note 1)	{0.4.0.2.2.5.1.23} to {0.4.0.2.2.5.1.29}	ETSI TS 102 232-1 V3.11.1 to ETSI TS 102 232-1 V3.19.1
ETSI TS 102 232-2 (section 6.5.4)		
EmailPDU (Note 1)	{0.4.0.2.2.5.2.15} to {0.4.0.2.2.5.2.17 }	ETSI TS 102 232-2 V3.9.1 to ETSI TS 102 232-2 V3.11.1
ETSI TS 102 232-3 (section 6.5.5)		
IPAccessPDU (Note 1)	{0.4.0.2.2.5.3.10} to {0.4.0.2.2.5.3.13 }	ETSI TS 102 232-3 V3.3.1 ETSI TS 102 232-3 V3.7.1
ETSI TS 102 232-5 (section 6.5.6)		
IPMultimediaPDU (Note 1)	{0.4.0.2.2.5.5.7} to {0.4.0.2.2.5.5.12}	ETSI TS 102 232-5 V3.5.1 ETSI TS 102 232-5 V3.11.1

ETSI TS 102 232-6 (section 6.5.7)		
PstnIsdnPDU (Note 1)	{0.4.0.2.2.5.6.5}	ETSI TS 102 232-6 V3.3.1

Table 6-27: 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 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 V1.24.1, 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 V1.24.1 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 V1.24.1 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 V1.24.1 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 covers 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 V1.24.1 Annex D.1.
Network access	Network access services covers 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 V1.24.1 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 V1.24.1. 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	**HD_28_NA** Network access retroactive interception	Identifiers parameters ETSI TS 102 657 V1.24.1 Annex E	7.3 7.5 7.4.4

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	**HD_29_TEL** Telephony and multimedia services retroactive interception	Identifiers parameters ETSI TS 102 657 V1.24.1 Annex D	7.3 7.5 7.4.3
62 68	**HD_30_EMAIL** E-Mail services retroactive interception	Identifiers parameters ETSI TS 102 657 V1.24.1 Annex C	7.3 7.5 7.4.2
63 68	**HD_31_PAGING** Delivery of the last active location of the target.	Identifiers parameters & Proprietary handover interface	7.3 7.4.5
64 68	**AS_32_PREP_COV** Network analysis in preparation of a search by cell coverage area	Identifiers parameters ETSI TS 102 657 V1.24.1 Annex D or Annex E	7.3 7.5 7.4.6 7.4.4
65 68	**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 V1.24.1 Annex D or Annex E	7.3 7.5 7.4.7 7.4.4
66 68	**AS_34** **AS_34_MORE** Search by cell coverage area by mobile telephony and network access	Identifiers parameters ETSI TS 102 657 V1.24.1 Annex D or Annex E	7.3 7.5 7.4.8 7.4.3 7.4.4

Table 7-3: Historical data applications interception types

Historical data emergency search			
VÜPF article	**Type & Description** (Informative translation)	**Identifiers Handover Interfaces**	**Section**
67a	**EP_35_PAGING** Delivery of the last active location	Identifiers parameters & Proprietary handover interface	7.3 7.5 7.4.5
67d	**EP_38_HD** Network access and telephony and multimedia services retroactive interception	Identifiers parameters ETSI TS 102 657 V1.24.1 Annex D or Annex E	7.3 7.5 7.4.3 7.4.4 7.4.9

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 V1.24.1 clauses 6.1 and 6.2

Element or attribute	Description	Example
rdHeaderId	Object Identifier	0.4.0.2.3.0.22
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"	20160319131625
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	RequestConstraints elements: equals lessThanOrEqualTo greaterThanOrEqualTo isAMemberOf

	one service and one category.	
deliveryPointHIB	Delivery point where the historical data must be sent to. In case of electronic delivery it can be either: URI Email address In case of delivery of a transportable physical storage media (e.g. CD, DVD, HDD): Civic address	URI: https://ptss-host[nn].lidn.ejpd.admin.ch/P/HIB/RDC/ (*where* [nn] *is a host-number defined by PTSS*). Email: rd@li.admin.ch Civic address: LEA, Town-street 1, 9999 Anytown
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 V1.24.1 clauses 6.1 and 6.2.

Element or attribute	Description	Example
rdHeaderId	Object Identifier	0.4.0.2.3.0.22
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 Void

7.4.2 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 V1.24.1 Annexes A and C.

7.4.2.1 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

7.4.2.2 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 V1.24.1 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

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 messages, and for outgoing messages that have a local recipient.	2174A46EFB23

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

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

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 V1.24.1 Annex C.3	connect disconnect retrieveMsg partialretrieveMsg deleteMsg addMsg editMsg

7.4.3 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 V1.24.1 Annexes A and D.

7.4.3.1 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 V15.5.0 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

7.4.3.2 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 V1.24.1 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 (11/08).	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 (11/08).	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 V15.7.0 clause 5.1.3.1.2 and ETSI TS 124 229 V15.7.0 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 location information structure may be composed of three main information structures: 1) Cell and area identity, 2) Geographical coordinates, 3) Postal location.

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
NR radio access technology:
1) Cell and area identity elements: nCGI, trackingAreaIdentifier
2) Geographical coordinates elements: gsmLocation
3) Postal location elements: any available field

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

<u>Wireless LAN network access:</u>
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 V13.4.0 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]*
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 V13.4.0 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 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 ETSI TS 129 274 V15.5.0 cl. 8.21.4 and the 5G TAI see 3GPP TS 23.003 V15.7.0 cl. 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 V15.7.0 cl. 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)	AB12CD34E0
n3gppaLocation	Table B.11
Description and requirements	*Example*
Non-3GPP access user location, see 3GPP TS 29.571 V15.4.0 clause 5.4.4.10 This element shall contain: - Unique non-3GPP TAI used in the PLMN. MCC(2 octets)+MNC(1 octet)+TAC(3 octets) - The N3IWF identifier received over NGAP MCC(2 octets)+MNC(1 octet)+N3IWF-ID(2 octets). - UE local IPv4 address (used to reach the N3IWF) or UE local IPv6 address (used to reach the N3IWF). - UDP or TCP source port number. It shall be present if NAT is detected.	22F899AC7D7622F899ABC2-198.51.100.1-49345
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 V1.24.1 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	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. 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	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
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	20140214225215+0100 20140615092618+0200 20140712161528.7+0200 20170710144216Z

format is according to the GeneralizedTime parameter specified in ITU-T X.680 (11/08).	
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")*

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 V15.5.0 clause 7.7.53.	3568431553965790

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.	410 200

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.	

communicationType	Table D.5
Description and requirements	*ELEMENTS*
The type of communication that has been used for the session by the target, if available.	multimediaFixed multimediaWireless multimediaNetworkIndependent telephonyFixed telephonyWireless sMS mMS

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 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

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).	 deliverSCtoMS deliverReportMStoSC statusReportSCtoMS commandMStoSC submitMStoSC submitReportSCtoMS reservedMTIValue
3) smsStatus	Table B.7
Description and requirements	*ELEMENTS*
Status reached by the short message (SM)	 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

7.4.4 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 V1.24.1 Annexes A and E.

7.4.4.1 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
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

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

7.4.4.2 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 V1.24.1 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 V15.5.0. 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 V15.7.0 and 3GPP TS 23.402 V15.3.0. 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 V15.6.0 and 3GPP TS 23.502 V15.6.0. 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 (11/08).	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 (11/08).	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 address in case of cable modem or wlan access or an IMEI in case of Mobile PS access. It shall be provided as UTF8String.	a1:23:45:67:8d:5b 357160045577005

naAssignedAddress	Table E.3
The naAssignedAddress structure shall be composed of the following 2 elements: 1) set of IPAddress, 2) 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) 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. The location information structure may be composed of five main information structures: 1) Cell and area identity, 2) Geographical coordinates, 3) Postal location, 4) maritimeTransport and 5) 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 Radio	

Access and the Core network, a specific structure for Location is specified in the section 7.4.4.2.1 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) Maritime transport
5) 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

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 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 identities for GERAN or UTRAN network access. In this case there is no need to provide the globalCellID or sAI field.	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 V15.7.0 cl. 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]	AB12CD34E0
trackingAreaIdentifier	Table B.11
Description and requirements	*Example*
The "Tracking Area Identity" is coded in accordance with ETSI TS 129 274 V15.5.0 cl. 8.21.4 and the 5G TAI see 3GPP TS 23.003 V15.7.0 cl. 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
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 V15.4.0 clause 5.4.4.10 This element shall contain: - Unique non-3GPP TAI used in the PLMN. MCC(2 octets)+MNC(1 octet)+TAC(3 octets) - The N3IWF identifier received over NGAP. MCC(2 octets)+MNC(1 octet)+N3IWF-ID(2 octets). - UE local IPv4 address (used to reach the N3IWF) or UE local IPv6 address (used to reach the N3IWF). - UDP or TCP source port number. It shall be present if NAT is detected.	22F899AC7D7622F899ABC2-198.51.100.1-49345
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 V1.24.1 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) 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
5) 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 V13.5.0 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 gprs 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 V13.8.0 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 V13.7.0 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 V15.6.0 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 V15.7.0. 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 V15.7.0 Clause 6.4, if available.	
iMEI	359040082042280F
iMEISV	3571600455770051
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 V15.3.0, 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).	252-19CDE0 29

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 standardized 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.	
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 V15.3.0 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 V15.3.0 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 V15.3.0 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 V15.3.0 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 V15.3.0 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 V15.4.0, it may be dual IPV4V6, IPV4, IPV6, Unstructured; Ethernet See 3GPP TS 32.291 V15.3.0 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 V15.3.0 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 V15.3.0 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 V15.3.0 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 V15.3.0 clause 6.2.1.2 and 3GPP TS 29.571 V15.4.0 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 V15.6.0, mentioned in 3GPP TS 32.255 V15.3.0.	4655eb25-e5c8-435a-b0ea-7460d8f28cce
21) aMFIdentifier	Table E.5C
Description and requirements	*Examples*
The AMF identifier, function defined in 3GPP TS 23.501 V15.6.0, mentioned in 3GPP TS 32.255 V15.3.0 and 3GPP TS 29.571 V15.4.0 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 Radio Access Technology (RAT) type of PDU session used by the Mobile Station as defined in 3GPP TS 29.571 V15.4.0, 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 V15.3.0 clause 6.1.6.2.2.8	nr, eutra, wlan, virtual,

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

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

7.4.4.2.1 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 V1.24.1 Annex E.2.4 when the mobile 3GPP access location information is obtained or derived by the CSP via the NAS messages exchanged on the Non-Access Stratum (NAS) interface between the Radio Access and the Core networks.

The following elements derived from the 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 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 NAS messages.

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 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
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
trackingAreaIdentifier	22F899AB56E3
locationInformationSource	NAS
fiveGSInformation	
sUPI	
iMSI	228993035511773F

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

7.4.5 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 electronically via the administrative interface.	HI-A according to ETSI TS 102 657 V1.24.1 or Secure Email
2	PTSS contacts the CSP by telephone and provides the known information of the instruction and target.	Telephone
3	PTSS issues and sends the corresponding request as specified in section 7.4.5.1	HI-A
4	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
5	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 7.4.5.2.	Secure email

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

7.4.5.1 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.	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.	3568431553965710 359040082042280F

	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 V15.5.0 clause 7.7.53.	

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

Parameters names	Comments	Examples
Zielidentität / Identité de la cible		
MSISDN	Mandatory	41774XXXXXX
IMSI	Conditional	22899YYYYYYYYY
IMEI	Conditional	354449ZZZZZZZZ
Netzzugang / Accès réseau		
RADIO ACCESS TECHNOLOGY / FREQUENCY	Technology (GSM or UMTS or LTE) and Frequency band in MHz	UMTS900 LTE1800 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 / format: without MCC/MNC and no leading zeros	4343
ENB+CI (DECIMAL)	Conditional: E-UTRAN / format: without MCC/MNC and no leading zeros	17787394
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 X COORDINATES (CH1903)	CH1903 Geodetic system X coordinates	534749
CELL Y COORDINATES (CH1903)	CH1903 Geodetic system Y coordinates	153807
CELL N COORDINATES (CH1903+)	CH1903+ Geodetic system N coordinates (north)	1214749
CELL E COORDINATES (CH1903+)	CH1903+ Geodetic system E coordinates (east)	2601349

Table 7-8: Parameters to be delivered for the last active location

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

7.4.6.1 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, longitude and azimuth) are defined in detail in ETSI TS 102 657 V1.24.1 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

7.4.6.2 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 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 ETSI TS 129 274 V15.5.0 cl. 8.21.4 and the 5G TAI see 3GPP TS 23.003 V15.7.0 cl. 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 V15.7.0 cl. 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]	AB12CD34E0

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

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

7.4.7.1 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	20190428110000Z

	according to the GeneralizedTime parameter specified in ITU-T X.680 (11/08).	
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 (11/08).	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. (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 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	20181028090000Z

	time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (11/08).	
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 (11/08).	20181028080000Z

7.4.7.2 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	International National Unknown

	“partyIdentity” element in order to avoid any ambiguity.	
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. 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 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 V15.7.0 cl. 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	AB12CD34E0

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]*
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), composed of the concatenation of the PLMN Identifier (PLMN-Id) and the NR Cell Identity (NCI) as shown in 3GPP TS 23.003 V15.7.0 cl. 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	AB12CD34E0
additionalLocations	Structure used to provide the cell identity information during and at the end of the reference mobile network access session, if available.	
TimedLocation		
Location		
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). 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), composed of the concatenation of the PLMN Identifier (PLMN-Id) and the NR	

	Cell Identity (NCI) as shown in 3GPP TS 23.003 V15.7.0 cl. 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	AB12CD34E0
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. (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

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

7.4.8.1 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 V13.4.0. 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 ETSI TS 129 274 V15.5.0 cl. 8.21.4 and the 5G TAI see 3GPP TS 23.003 V15.7.0 cl. 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 V15.7.0 cl. 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	AB12CD34E0
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). 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), composed of the concatenation of the PLMN Identifier (PLMN-Id) and the NR Cell Identity (NCI) as shown in 3GPP TS 23.003 V15.7.0 cl. 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	AB12CD34E0
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

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

7.4.8.2 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 7.4.3.2

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 7.4.4.2

7.4.9 EP_38_HD Combined network access and multimedia service usage for emergency paging

7.4.9.1 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 7.4.3.1.

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 7.4.4.1.

7.4.9.2 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 7.4.3.2

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 7.4.4.2

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 delivery method is subject to a bilateral agreement between the PTSS and the CSP.

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 V1.24.1	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 V1.24.1	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 V1.24.1	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 V1.24.1	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 V1.24.1	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 definition of URI is subject to confidential agreements between PTSS and each CSP. 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 V1.24.1	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 use of the manual technique is subject to a bilateral agreement between the PTSS and the CSP.	Manual techniques include: - Use of secure email or fax 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 7-9: ETSI TS 102 657 V1.24.1 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 V1.24.1 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 7-10: 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 V1.24.1	
RDMessage XML Schema (xsd)	RDMessage,ver22.xsd xmlns="http://uri.etsi.org/02657/v1.24.1#/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 7-11: 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 section 4 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 V1.24.1.

8.2 Information request types

The table below lists the information requests types specified in section 4 of 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 V1.24.1 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 V1.24.1 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 V1.24.1 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 V1.24.1 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 V1.24.1 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 V1.24.1 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 V1.24.1 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 V1.24.1 Annexes A and C	8.4.3.1 8.4.3.2
43 27	**IR_15_COM** **IR_16_COM_FLEX**	Identifiers parameters ETSI TS 102 657 V1.24.1 Annexes A and E	8.4.4.1 8.4.4.2

	Communication service subscription information		

Table 8-2: Information requests for telecommunication applications types

Information requests for billing and payment of telecommunication services and network information			
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 V1.24.1 Annexes A and D	8.4.5.3 8.4.5.4
45	**IR_18_ID** Identity document copy for all services	Identifiers parameters ETSI TS 102 657 V1.24.1 Annexes A and D	8.4.6.3 8.4.6.4
46	**IR_19_BILL** Billing document copy for all services	Identifiers parameters ETSI TS 102 657 V1.24.1 Annexes A and D	8.4.7.3 8.4.7.4
47	**IR_20_CONTRACT** Contract document copy for multimedia and telephony services	Identifiers parameters ETSI TS 102 657 V1.24.1 Annexes A and D	8.4.8.3 8.4.8.4
48	**IR_21_TECH** Technical data for mobile and WLAN network access information	Identifiers parameters ETSI TS 102 657 V1.24.1 Annexes A and E	8.4.9.1 8.4.9.2

Table 8-3: Information requests for billing and payment of telecommunication services and network information types

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 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 V1.24.1 clauses 6.1 and 6.2

Element or attribute	**Description**	**Example**
rdHeaderId	Object Identifier	0.4.0.2.3.0.22
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, 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	RequestConstraints elements: equals lessThanOrEqualTo greaterThanOrEqualTo

	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 historical 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 8-4: 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 V1.24.1 clauses 6.1 and 6.2.

Element or attribute	Description	Example
rdHeaderId	Object Identifier	0.4.0.2.3.0.22
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 "file-number" of the XML order.dtd file.	IR_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	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 8-5: 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 V1.24.1 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	
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
allocatedDevices	SEQUENCE OF	
NADevice		
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 Central Business Index (zefix.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 V1.24.1 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	
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.	Internet Access Mobile Unlimited
options	Human readable text with restrictions or options to the subscription	International data pack
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	
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	
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	
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 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
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 Central Business Index (zefix.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
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 (0) female (1)
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

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	
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. (IMSI is 15 digits long + last digit "F" as a filler half-octet)	228993035511773F
allocatedDevices	SEQUENCE OF	
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
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 V1.24.1 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	Time period during which the information given in this structure is or was valid.	
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
allocatedDevices	SEQUENCE OF NADevice	
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
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

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

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 V1.24.1 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.	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	NA7654321

	defined in the NASubscriber sequence.	
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	
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

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 V1.24.1 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.	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.	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

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	
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	
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

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 V1.24.1 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	

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 network access information requests and responses relate to ETSI TS 102 657 V1.24.1 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 Central Business Index (zefix.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

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 V1.24.1 Annexes A and D.

network access 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
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 Central Business Index (zefix.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
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 (0) female (1)
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	Party identity or identities of the multimedia or telephony subscriber.	41771112233 sip:+41771112233@csp.ch tel:+41771112233 sip:+ 41992305887@csp.ch tel:+41992305887
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	
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
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

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
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

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 V1.24.1 Annexes A and D.

network access 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	
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	Party identity or identities of the multimedia or telephony subscriber.	41771112233 sip:+41771112233@csp.ch tel:+41771112233 sip:+41992305887@csp.ch tel:+41992305887
iMEIs	SEQUENCE OF	
IMEI	International Mobile Equipment Identity	3571600455770210 359040082042280F
registeredICCIDs	SEQUENCE OF	
ICCIDInfo		
iCCID	Integrated Circuit Card ID of the subscriber (SIM)	89410228641400127777
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.	228993035511773F

	(IMSI is 15 digits long + last digit "F" as a filler half-octet)	
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
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)*

8.4.2.5 Void

8.4.2.6 Void

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 V1.24.1 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.

Multimedia 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	
MsgStore	SEQUENCE	
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 V1.24.1 this element is specified as a “string”.	joe.muster@cspdomain.ch
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 Central Business Index (zefix.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 V1.24.1 Annexes A and C.

network access 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 V1.24.1 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	joe.muster@cspdomain.ch

	Internet e-mail this shall be an RFC2822-style address.	
msgStoreSubscriberRelatedIDs	SEQUENCE OF	
ContactDetails	SEQUENCE	
contactNumber	Further addressing elements linked to the service. e.g. phone number	41771112233
emailAddress	Further addressing elements linked to the service. e.g. email	hans.muster@foobar.ch
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 Central Business Index (zefix.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 (0) female (1)
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 V1.24.1 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	
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 Central Business Index (zefix.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 V1.24.1 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	
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
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.	
allocatedDevices	SEQUENCE OF	
NADevice	SEQUENCE	
subscriberID	One or more identifiers for this subscription, e.g. logon name	Joe123456
naServiceStatus	Information about the status of the subscribed service.	active ceased suspended
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 Central Business Index (zefix.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 (0) female (1)
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 V1.24.1 Annexes A and D and E.

8.4.5.1 Void

8.4.5.2 Void

8.4.5.3 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 V1.24.1 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.	

8.4.5.4 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 V1.24.1 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 Void

8.4.6.2 Void

8.4.6.3 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
allocatedDeviceIDs	SEQUENCE OF	
MultimediaDeviceID	A unique identifier for the multimedia device. NOTE: Unlike in ETSI TS 102 657 V1.24.1 this element is specified as a “string”.	SOM876352

8.4.6.4 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 V1.24.1 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 Void

8.4.7.2 Void

8.4.7.3 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
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. NOTE: Unlike in ETSI TS 102 657 V1.24.1 this element is specified as a “string”.	SOM876352

8.4.7.4 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 V1.24.1 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		
copyOfBill	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	

8.4.8 Contract document copy information requests and responses

8.4.8.1 Void

8.4.8.2 Void

8.4.8.3 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
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
allocatedDeviceIDs	SEQUENCE OF	
MultimediaDeviceID	A unique identifier for the multimedia device. NOTE: Unlike in ETSI TS 102 657 V1.24.1 this element is specified as a “string”.	SOM876352

8.4.8.4 IR_20_CONTRACT response elements and structure for contract document copy

At the time of edition of the present document no standardised ETSI handover interface exists for the delivery of documents in electronic form, such as pdf or jpg or png files.
As a temporary alternative until a standardised solution is published by ETSI, the electronic format contract document copy shall be uploaded via the Graphical User Interface (GUI) of the Information Request Component (IRC) application provided by the PTSS.

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 V1.24.1 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		
location	SEQUENCE	
globalCellID	Cell Global Identity used for GERAN and UTRAN according to 3GPP TS 23.003. 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 V13.8.0.	0722F890056C8720 *[in hexadecimal format]*

	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)	
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 V15.7.0 cl. 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)	AB12CD34E0

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 V1.24.1 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		
location	SEQUENCE	
globalCellID	Cell Global Identity used for GERAN and UTRAN according to 3GPP TS 23.003 V13.8.0. 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 V13.8.0 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	N465648.10

	the Earth's surface according to the World Geodetic System 1984.	
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 V13.8.0 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
tAI	Tracking Area Identifier used for E-UTRAN according to 3GPP TS 23.003 V13.8.0. 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 V13.8.0. 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]*
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 V15.7.0 cl. 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)	AB12CD34E0

8.4.9.3 Void

8.4.9.4 Void

8.5 Handover interfaces requirements

8.5.1 ETSI TS 102 657 V1.24.1 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 V1.24.1 are specified in section 7.5.

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 Retained Data Component systems, and this requires a new compliance assessment.

Applicable XML Schema	Requirement or instruction for application
ETSI TS 102 657 V.1.24.1	
RDMessage XML Schema (xsd)	RDMessage,ver22.xsd

	xmlns="http://uri.etsi.org/02657/v1.24.1#/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 8-6: Applicable XML schema version for information requests

9 Security

9.1 Data Protection

In order to ensure the confidentiality of data, the legal requirements of the Federal Act on Data Protection “Bundesgesetz über den Datenschutz (DSG) vom 19. Juni 1992 (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 and ITU Recommendations used in this annex. It is meant to ease the reading and implementation of the handover interfaces specified in the present document.

ETSI TS 101 671 V3.12.1	Telecommunication security; Lawful interception (LI); Handover interface for the lawful interception of telecommunication traffic
ETSI TS 102 232-1 V3.19.1	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 V3.11.1	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 V3.7.1	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 V3.11.1	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 V3.3.1	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 V3.6.1	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 V1.12.1	Lawful Interception (LI); ASN.1 Object Identifiers in Lawful Interception and Retained data handling Specifications
ETSI TS 102 657 V1.24.1	Lawful Interception (LI); Retained data handling; Handover interface for the request and delivery of retained data
ETSI TS 103 221-1 V1.5.1	Lawful Interception (LI); Part 1: Internal Network Interface X1 for Lawful Interception
ETSI TS 103 221-2 V1.1.1	Lawful Interception (LI); Part 2: Internal Network Interface X2/X3 for Lawful Interception
ETSI TS 103 120 V1.3.1	Lawful Interception (LI); Interface for warrant information
ETSI TS 103 280 V2.3.1	Lawful Interception (LI); Dictionary for common parameters
ETSI TS 132 298 V15.7.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; Charging Data Record (CDR) parameter description
ETSI TS 133 107 V15.6.0	Universal Mobile Telecommunications System (UMTS); LTE; 3G security; Lawful interception architecture and functions
ETSI TS 133 108 V15.5.0	Universal Mobile Telecommunications System (UMTS); LTE;3G security; Handover interface for Lawful Interception (LI)

ETSI TS 133 127 V15.2.0	Technical Specification Group Services and System Aspects; 5G Security; Lawful Interception (LI) architecture and functions
ETSI TS 133 128 V15.1.0	Technical Specification Group Services and System Aspects; 5G Security; Protocol and procedures for Lawful Interception (LI); Stage 3
ETSI ES 282 002 V1.1.1	Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN);PSTN/ISDN Emulation Sub-system (PES)
ETSI EN 300 403 V1.3.1	Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control
ETSI ETS 300 974 (2000)	European Telecommunication Standard (ETS) 300 974, 2000-12; GSM – Digital cellular telecommunications system (Phase 2+); Mobile Application Part (MAP) specification
ETSI TS 129 002 V15.4.0	Universal Mobile Telecommunications System (UMTS); Mobile Application Part (MAP) specification
ETSI TS 123 228 V15.4.0	IP Multimedia Subsystem (IMS); Stage 2
ETSI TS 124 229 V15.7.0	IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3
3GPP TS 23.003 V15.7.0	Universal Mobile Telecommunications System (UMTS); Numbering, addressing and identification
3GPP TS 23.008 V15.7.0	Technical Specification Group Core Network and Terminals; Organization of subscriber data;
3GPP TS 23.032 V15.1.0	Universal Mobile Telecommunications System (UMTS); Universal Geographical Area Description (GAD)
3GPP TS 23.040 V15.3.0	Technical Specification Group Core Network and Terminals; Technical realization of the Short Message Service (SMS)
3GPP TS 23.060 V15.5.0	Universal Mobile Telecommunications System (UMTS); General Packet Radio Service (GPRS); Service description; Stage 2
3GPP TS 23.272 V15.0.0	LTE; Circuit Switched (CS) fallback in Evolved Packet System (EPS); Stage 2
3GPP TS 23.401 V15.7.0	LTE; General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access
3GPP TS 23.402 V15.3.0	Universal Mobile Telecommunications System (UMTS); LTE; Architecture enhancements for non-3GPP accesses
3GPP TS 23.501 V15.6.0	Technical Specification Group Services and System Aspects; System Architecture for the 5G System; Stage 2
3GPP TS 23.502 V15.6.0	Technical Specification Group Services and System Aspects; Procedures for the 5G System; Stage 2
3GPP TS 23.503 V15.6.0	Technical Specification Group Services and System Aspects; Policy and Charging Control Framework for the 5G System; Stage 2
3GPP TS 24.007 V15.3.0	Technical Specification Group Core Network and Terminals; Mobile radio interface signalling layer 3; General aspects

3GPP TS 24.501 V15.4.0	Technical Specification Group Services and System Aspects; Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3
3GPP TS 24.502 V15.4.0	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 V15.5.0	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 V15.7.0	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 V15.5.0	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 V15.4.0	Technical Specification Group Core Network and Terminals; 5G System; Access and Mobility Management Services; Stage 3
3GPP TS 29.520 V15.4.0	Technical Specification Group Core Network and Terminals; 5G System; Network Data Analytics Services; Stage 3
3GPP TS 29.540 V15.4.0	Technical Specification Group Core Network and Terminals; 5G System; SMS Services; Stage 3
3GPP TS 29.571 V15.4.0	Technical Specification Group Core Network and Terminals; 5G System; Common Data Types for Service Based Interfaces; Stage 3
3GPP TS 29.572 V15.4.0	Technical Specification Group Core Network and Terminals; 5G System; Location Management Services; Stage 3
3GPP TS 32.251 V15.5.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; Packet Switched (PS) domain charging
3GPP TS 32.255 V15.3.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; 5G data connectivity domain charging;
3GPP TS 32.260 V15.2.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; IP Multimedia Subsystem (IMS) charging
3GPP TS 32.291 V15.3.0	Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; 5G system, charging service; Stage 3
3GPP TS 33.401 V15.8.0	Technical Specification Group Services and System Aspects; 3GPP System Architecture Evolution (SAE); Security architecture
3GPP TS 33.501 V15.5.0	Technical Specification Group Services and System Aspects; Security architecture and procedures for 5G system

3GPP TS 36.413 V15.5.0	Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)
3GPP TS 37.340 V15.6.0	Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA) and NR; Multi-connectivity; Stage 2
3GPP TS 38.413 V15.3.0	Technical Specification Group Radio Access Network; NG-RAN; NG Application Protocol (NGAP)
IETF RFC 2279	UTF-8, a Transformation Format of ISO 10646
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 4282	The Network Access Identifier
IETF RFC 4880	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
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 (12/09)	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.763 (12/99)	ITU-T Recommendation Q.763, “Specifications of signalling System No.7; ISDN user part; Formats and codes”
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 (11/08)	ITU-T Recommendation X.680, Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation
ITU-T X.690 (12/97)	ITU-T Recommendation X.690; Data Networks and Open System Communication – OSI networking and system aspects – Abstract Syntax Notation One (ASN.1)

Table 10-1: List of technical specifications