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

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

DRAFT Version 2.2~~1~~

Entry into force: ??.??.2022~~1~~

# 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.

**Contents**

# 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 |
| GSMA | GSM Association |
| 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 |
| NID | Network Identity |
| NPLI | Network Provided Location Information |
| NR | New Radio |
| NRF | Network Repository Function |
| OFCOM | Federal Ofice 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 V1.26.1 <br><br> Annex 1 Section 4.2.4 | Secure Email <br><br><br><br> Annex 1 Section 4.3.3.2 | Telephone / Fax <br><br><br><br> Annex 1 Section 4.4 |
| 54 to 59, 68a,68b | Real-time interception instructions Abbr.: LITask | HI-1 according to ETSI TS 103 120 V1.93.1 <br><br> Annex 1 Section 4.2.2 or 4.2.3 | Secure Email <br><br><br><br> Annex 1 Section 4.3.3.1 | Telephone / Fax <br><br><br><br> Annex 1 Section 4.4 |
| 67b,67c | Real-time interception instructions for emergency search | Telephone and HI-1 according to ETSI TS 103 120 V1.93.1 <br><br> Annex 1 Section 4.4 Section 4.2.2 or 4.2.3 | Telephone and Secure Email <br><br><br><br> Annex 1 Section 4.4 Section 4.3.3.1 | Telephone and Fax <br><br><br><br> 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 V1.26.1 <br><br> Annex 1 Section 4.2.4 | Secure Email <br><br><br><br> Annex 1 Section 4.3.3.2 | Telephone / Fax <br><br><br><br> Annex 1 Section 4.4 |

*Table 4-14-1: 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<br><br>Annex 1<br>Section 4.3.4.1 | Fax<br><br>Annex 1<br>Section 4.4 | Telephone<br><br>Annex 1<br>Section 4.4 | Registered post<br><br>Annex 1<br>Section 4.5 |

*Table 4 -24 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 V1.93.1)<br>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<br>Section 4.2.2 |
| Ad hoc HI1 XML over HTTP administrative interface for instructing real-time interceptions | Annex 1<br>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 V1.26.1) | Annex 1<br>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 V1.93.1)

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 V1.93.1 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 V1.93.1 Annex A.3 for a single "Central Authority" (warrant = order).
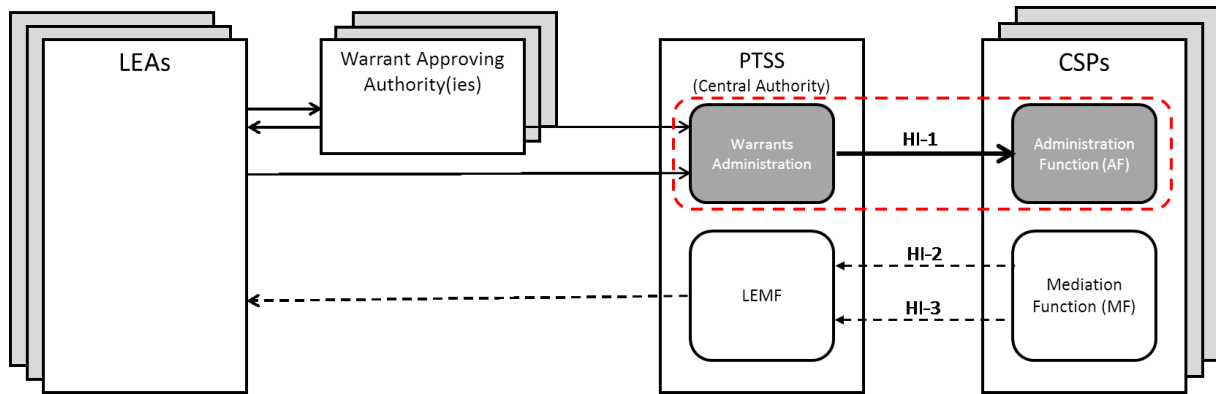
*Figure 4-1: HI-1 administrative interface for real-time interception instructions*

### 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 V1.93.1 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 4-34-3: Action messages used by the HI-1 interface via HTTP**

### 4.2.2.3 Message flow for a real-time interception activation instruction

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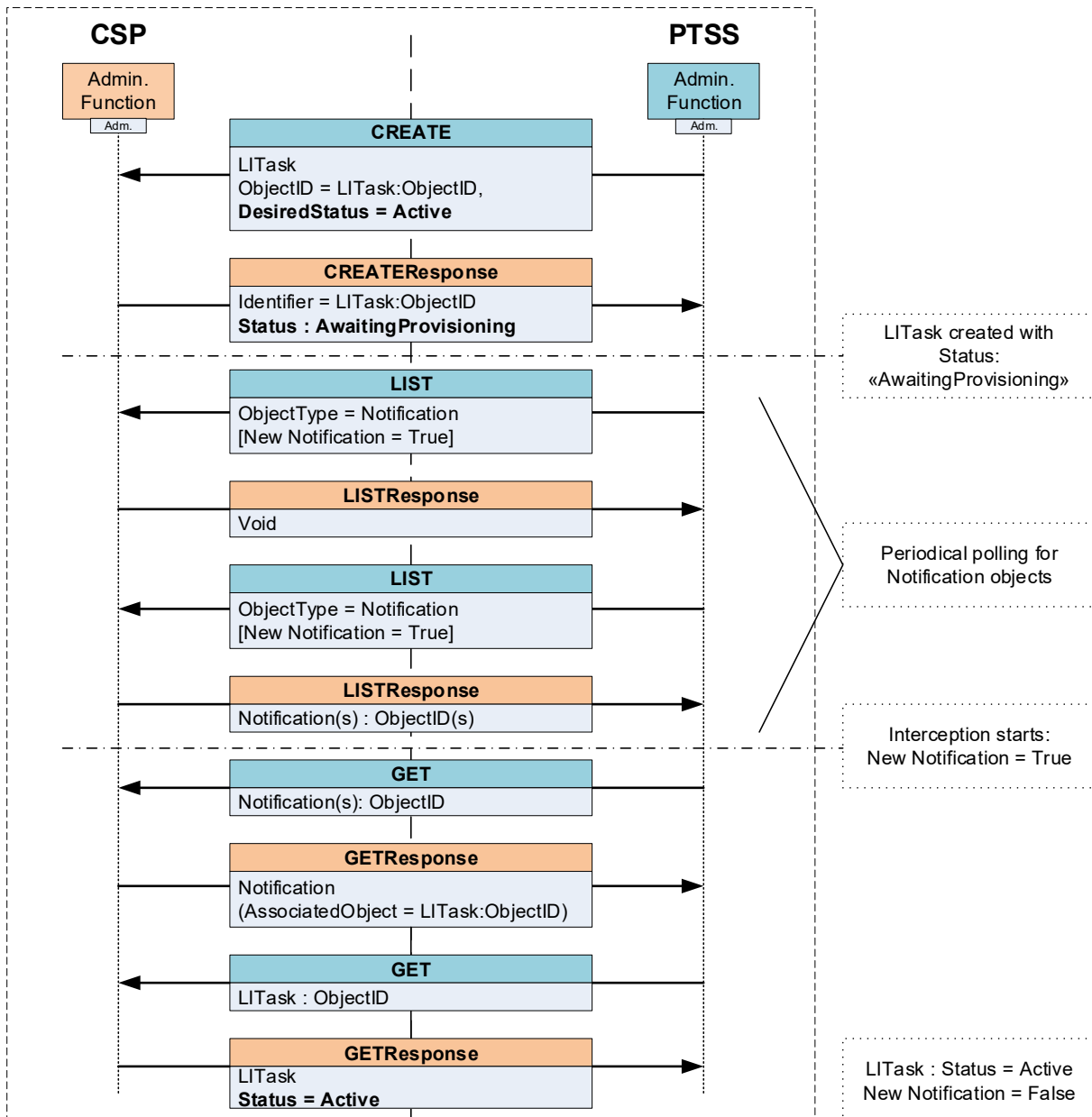


**Figure 4-2: Message flow for a real-time interception activation instruction based on HTTP**

### 4.2.2.4 Message flow for a real-time interception deactivation instruction

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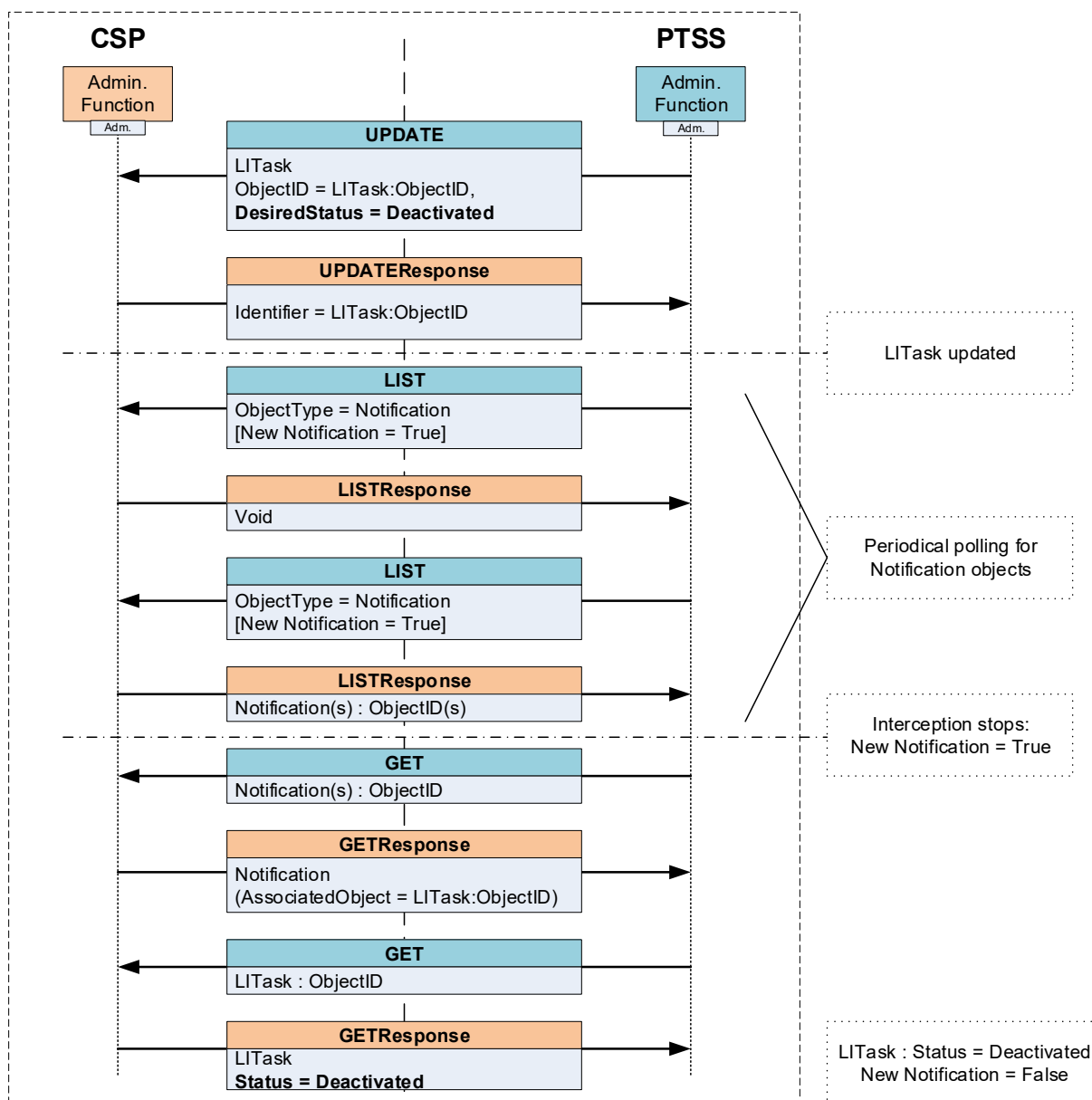


**Figure 4-3: Message flow for a real-time interception deactivation instruction based on HTTP**

### 4.2.2.5 Message flow for a real-time interception cancellation instruction

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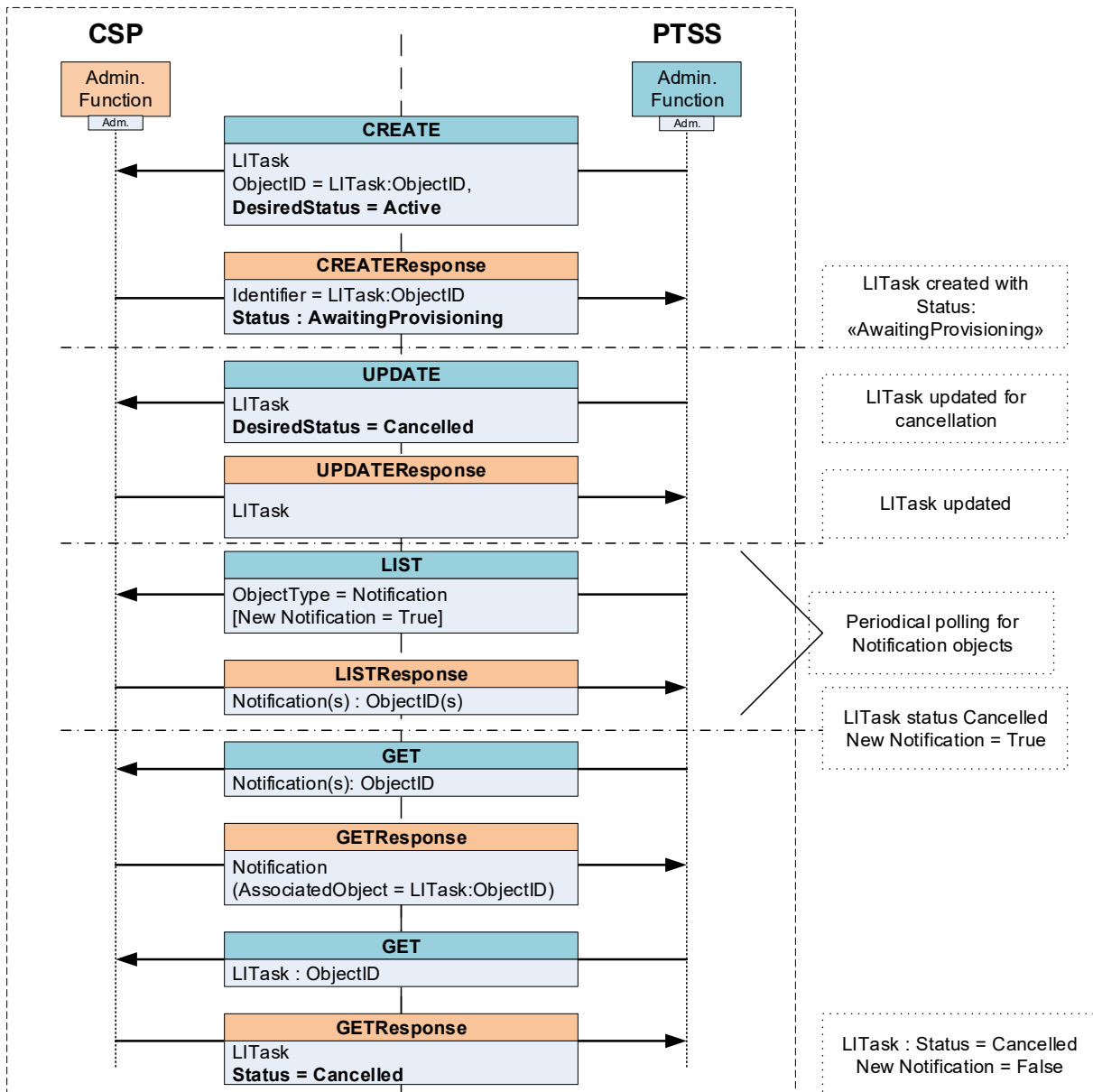


**Figure 4-4: Message flow for a real-time interception cancellation instruction based on HTTP**

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

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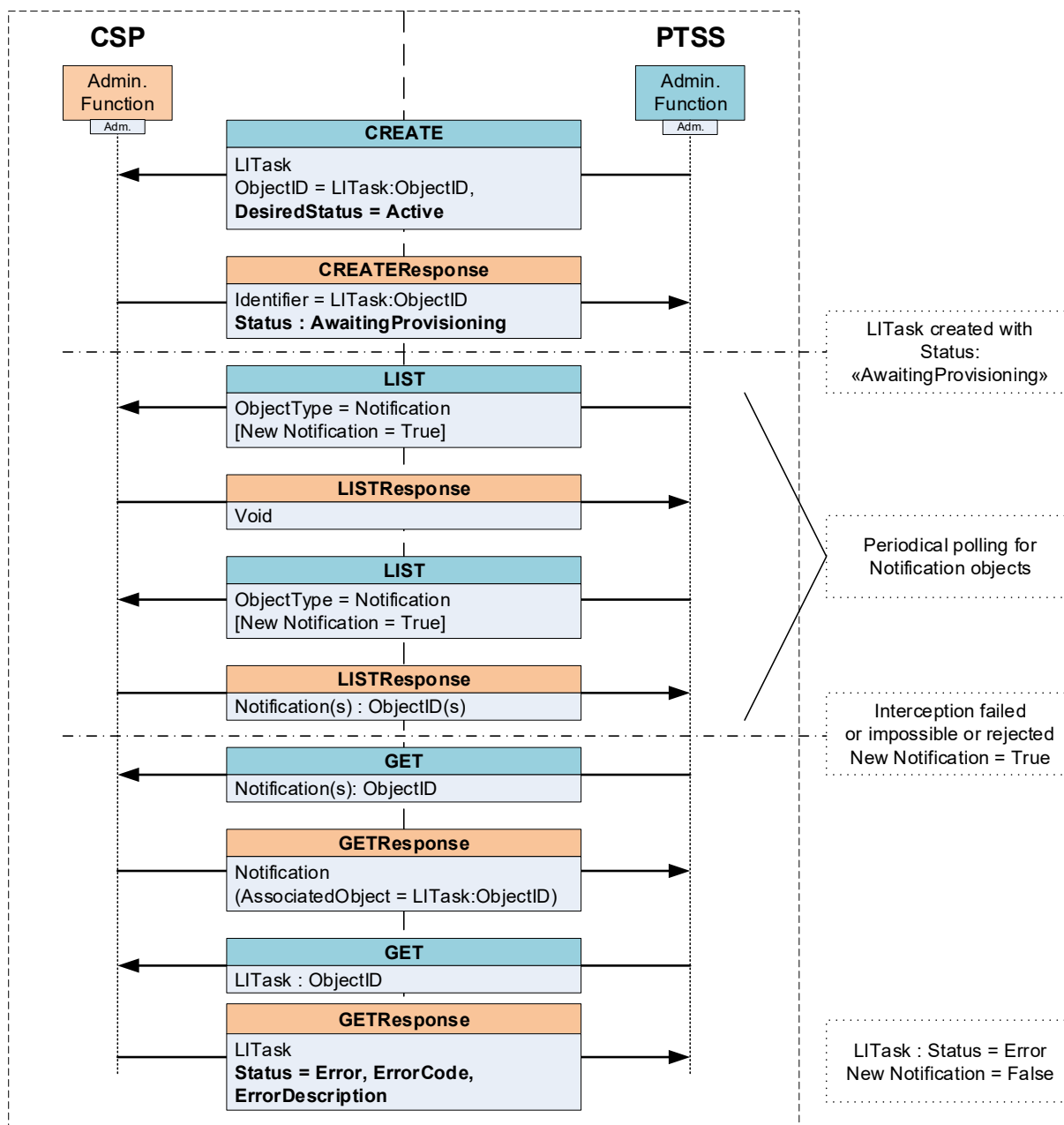


**Figure 4-5: Message flow in case of error or invalidity of a real-time interception instruction based on HTTP**

### 4.2.2.7 ETSI TS 103 120 V1.~~9~~3.1 requirements and options

The table below present the Swiss national options according to ETSI TS 103 120 V1.~~9~~3.1 and the real-time interception instructing process.

| Clause ETSI TS 103 120 V1.~~9~~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.~~6~~3.1) | ~~Currently V2.0.0~~ PTSS_DictionaryDefinitions V2.1.0.xml |
| 6.2.4 | **UniqueIdentifier:** Unique identifier sufficient for identifying the object/field within the country. LongString (see ETSI TS 103 280 V2.~~6~~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:<br><br>**HI-1 object required fields:**<br>ObjectIdentifier<br>Generation<br>ExternalIdentifier<br>AssociatedObjects<br>LastChanged<br><br>**Notification object required fields:**<br>NotificationType<br>NewNotification<br>NotificationTimestamp<br><br>**LITask object required fields:**<br>Reference<br>Status<br>TimeSpan<br>InvalidReason |

| Clause ETSI TS 103 120 V1.93.1 | 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:<br><br>**HI-1 object required fields:**<br>ObjectIdentifier<br>CountryCode<br>OwnerIdentifier<br>AssociatedObjects<br><br>**LITask object required fields:**<br>Reference<br>DesiredStatus<br>TimeSpan<br>TargetIdentifier<br>DeliveryDetails<br>CSPID<br>Flags |
|  | **CREATE Response** | List of the HI-1 Object fields required in the CREATE Response Messages:<br><br>**HI-1 object required fields:**<br>ObjectIdentifier<br>Generation<br>LastChanged<br><br>**LITask object required fields:**<br>Reference<br>Status |
| 6.4.7 | **UPDATE Request** | List of the HI-1 Object fields required in the UPDATE Request Messages:<br><br>**HI-1 object required fields:**<br>ObjectIdentifier<br><br>**LITask object required fields:**<br>Reference<br>DesiredStatus<br>TimeSpan |
|  | **UPDATE Response** | List of the HI-1 Object fields required in UPDATE Response Messages:<br><br>**HI-1 object required fields:**<br>ObjectIdentifier<br>Generation<br>LastChanged<br><br>**LITask object required fields:**<br>Reference |

| Clause ETSI TS 103 120 V1.9~~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 V1.9~~3~~.1 clause 6.4.8)<br><br>**LastChanged** field is not required for Notification related requests. |
| | **LIST Response (for Notification)** | Fields required in LIST Response Messages:<br><br>**Required**:<br>    ObjectType<br>    Identifier<br>    Generation<br>    CountryCode<br>    OwnerIdentifier<br>    LastChanged |
| 6.4.9 | **Action Unsuccessful Information** | **ErrorCode** and **ErrorInformation** shall match values of table D.1 "Detailed error codes" of ETSI TS 103 120 V1.9~~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**<br>PTSS dictionary reflects specific National PTSS Notification types. | **Dictionary owner:**<br>    PTSS<br><br>**Dictionary Name:**<br>    NotificationTypes<br><br>**Dictionary authorised values:**<br>    TaskStatusChanged<br>    TaskStatusActive<br>    TaskStatusCancelled<br>    TaskStatusDeactivated<br>    TaskStatusCompleted |
| **8.2 LITask Object** | | |

| Clause ETSI TS 103 120 V1.93.1 | Available options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 8.2.3 | **Status**<br>PTSS dictionary reflects specific National PTSS Status. | **Dictionary owner:**<br>PTSS<br><br>**Dictionary Name:**<br>TaskStatus<br><br>**Dictionary authorised values:**<br>*AwaitingProvisioning*: The Task is approved, but is not yet provisioned in the LI system.<br><br>*Active*: The Task is active and can produce LI traffic.<br><br>*Cancelled*: The Task has been permanently cancelled<br><br>*Error*: The Task is not active due to a problem with the underlying LI system or with the information in the Task Object.<br><br>*Deactivated*: The Task has been deactivated by the PTSS |

| Clause ETSI TS 103 120 V1.93.1 | Available options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 8.2.4 | **Desired Status**<br>PTSS dictionary reflects specific National PTSS DesiredStatus. | **Dictionary owner:**<br>    PTSS<br><br>**Dictionary Name:**<br>    TaskDesiredStatus<br><br>**Dictionary authorised values:**<br>***AwaitingProvisioning***: The Task is approved, but is not yet provisioned in the LI system.<br><br>***Active***: The Task is active and can produce LI traffic.<br><br>***Rejected***: The Task has been explicitly denied or rejected by one or more relevant authorities.<br><br>***Cancelled***: The Task has been permanently cancelled.<br><br>***Deactivated***: The Task has been deactivated by the PTSS.<br><br>***Error***: The Task is not active due to a problem with the underlying LI system or with the information in the Task Object. |
| 8.2.5 | **TimeSpan** | **TimeSpan** is split in 5 fields detailed below:<br><br>**StartTime** is populated by the PTSS in the CREATERequest (Activation) with required interception start date and time.<br><br>**EndTime** is populated by the PTSS in the UPDATERequest (Deactivation) with required interception stop date and time. |
| 8.2.6 | **TargetIdentifier** | **Required fields:**<br>        TargetIdentifierValues |

| Clause ETSI TS 103 120 V1.9̶3.1 | Available options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 8.2.8 | **DeliveryDetails** | **Required fields:**<br>    **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:**<br>    PTSS<br><br>**Dictionary Name:**<br>    DeliveryProfile<br><br>**Dictionary authorised values:**<br>    Production<br>    Integration_1<br>    Integration_2<br>    PMT_Production<br>    PMT_Integration_1<br>    PMT_Integration_2<br>    FLICC_Production<br>    FLICC_Integration_1<br>    FLICC_Integration_2 |
| 8.2.12 | **Flags** | **Dictionary owner:**<br>    PTSS<br><br>**Dictionary Name:**<br>    FlagsStatus<br><br>**Dictionary authorized values:**<br>    Normal<br>    TEST_PTE    (NOTE 1)<br>    TEST_PTSA  (NOTE 1)<br>    TEST_PTSE  (NOTE 1)<br>    TEST_PTSTR (NOTE 1)<br>    TEST_PTSTE (NOTE 1)<br>    TEST_CTT    (NOTE 1)<br>    TEST_ATT    (NOTE 1) |
| 9.3.2 | **Client/Server architecture** | On PTSS side the client uses the following timeout and retries configuration:<br>Connection timeout: 10 seconds<br>Read timeout: 30 seconds<br>Retry policy: every 1 minute, 15 retries<br>Final failure: Alert/requeue for manual processing. |

**Table 4̶4̶4̶: ETSI TS 103 120 V1.9̶3.1 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 V1.9̶3̶.1 Clause 6.2 Messages header | | |
|---|---|---|
| **Element or attribute** | **Description** | **Example** |
| SenderIdentifier/ CountryCode | | |
| | ISOCountryCode  giving 3166-1 alpha-2 code | CH |
| SenderIdentifier/ UniqueIdentifier | | |
| | LongString | PTSS |
| ReceiverIdentifier/ CountryCode | | |
| | See SenderIdentifier | CH |
| ReceiverIdentifier/ UniqueIdentifier | | |
| | See SenderIdentifier | 99908 |
| TransactionIdentifier | UUID  in IETF RFC 4122 canonical form | ee4165be-4817-11e6-beb8-9e71128cae77 |
| Timestamp | QualifiedMicrosecondDateTime | 2016-07-12T12:10:00.000000Z |
| Version/ ETSIVersion | | |
| | ShortString of the form "VX.Y.Z" (X gives major version, Y gives minor version, Z gives revision. | V1.3.1 or V1.9.1 |
| Version/ NationalProfileOwner | | |
| | National profile owner | PTSS |
| Version/ NationalProfileVersion | | |
| | ShortString | V2.1̶0̶.0 |

**Table 4-̶5̶4̶-̶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 V1.9̶3̶.1 Clause 6.4 | | |
|---|---|---|
| **CREATE request LITask** | | |
| **Element or attribute** | **Description** | **Example** |
| **HI-1 Object** | | |
| ObjectIdentifier | UUID according to IETF RFC 4122 canonical form | 8a1a0c46-2495-46d5-82c3-1900dcecaaa6 |
| CountryCode | ShortString  and ISO 3166-1 Alpha-2 code | CH |
| OwnerIdentifier | ShortString | PTSS |
| ExternalIdentifier | LongString | 20160921876543 |

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

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

**Table 4-64-6: XML of a CREATE request payload**

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

| ETSI TS 103 120 V1.93.1 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 4-74-7: XML of a CREATEResponse payload**

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

| ETSI TS 103 120 V1.9~~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-~~84~~8: XML of a LIST request payload**

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

| ETSI TS 103 120 V1.9~~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-~~94~~9: XML of a LISTResponse payload**

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

| ETSI TS 103 120 V1.~~9~~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~~-104~~ ~~10~~: XML of a GET request payload**

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

| ETSI TS 103 120 V1.~~9~~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~~-114~~ ~~11~~: XML of a GETResponse payload**

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

| ETSI TS 103 120 V1.9~~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 4-124-12: XML of an UPDATE request payload**

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

| ETSI TS 103 120 V1.9~~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 4-134-13: XML of an UPDATEResponse payload**

### 4.2.2.9 Applicable XML schema version for real-time interception instructions

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

| Applicable XML Schema | Requirement or instruction for application |
|---|---|
| **ETSI TS 103 120 V1.93.1** | |
| XML Schema (xsd) | ts_103120v010301p0_Common.xsd<br>or<br>ts_103120v010901p0_Common.xsd |
| | ts_103120v010301p0_Core.xsd<br>or<br>ts_103120v010901p0_Core.xsd |
| | ts_103120v010301p0_Dictionaries.xsd<br>or<br>ts_103120v010901p0_Dictionaries.xsd |
| | ts_103120v010301p0_LITask.xsd<br>or<br>ts_103120v010901p0_LITask.xsd |
| | ts_103120v010301p0_Notification.xsd<br>or<br>ts_103120v010901p0_Notification.xsd |
| XML file | ts_103120v010301p0_ETSIDictionaryDefinitions.xml<br>or<br>ts_103120v010901p0_ETSIDictionaryDefinitions.xml |
| | _PTSS_DictionaryDefinitions V2.10.0.xml        (NOTE 1) |
| | |
| **ETSI TS 103 280 V2.63.1** | |
| XML Schema (xsd) | ts_103280v020301p0.xsd<br>or<br>ts_103280v020601p0.xsd |

**Table 4-144-14: Applicable XML schema version for real-time interception instructions**

NOTE 1: The file "_PTSS_DictionaryDefinitions V2.1.0.xml" is issued by PTSS and can be provided upon request to the CSP.

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

#### 4.2.3.1 Ad hoc HI-1 interface solution overview

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

This ad hoc interface uses most of the building blocks of the specification ETSI TS 103 120 V1.93.1 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 V1.93.1 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 V1.93.1).

#### 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 4-154-15: 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.
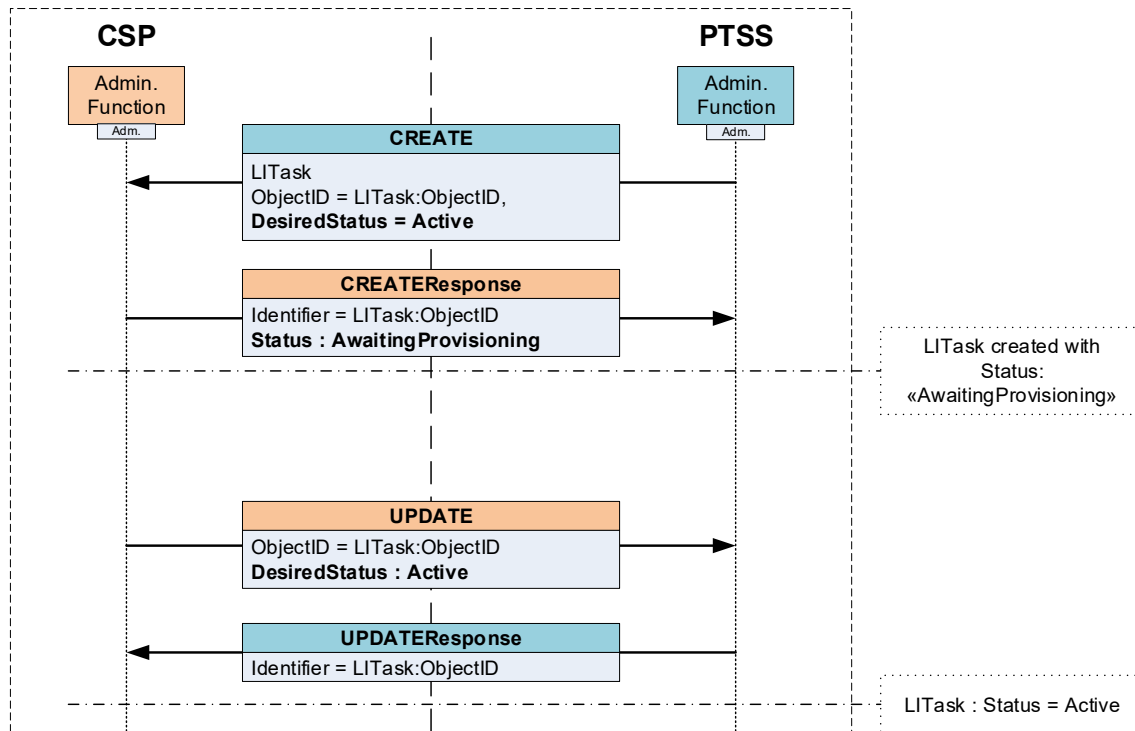
**Figure 4-7: Message flow for a real-time interception activation instruction based on ad hoc HI1 interface**

### 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.
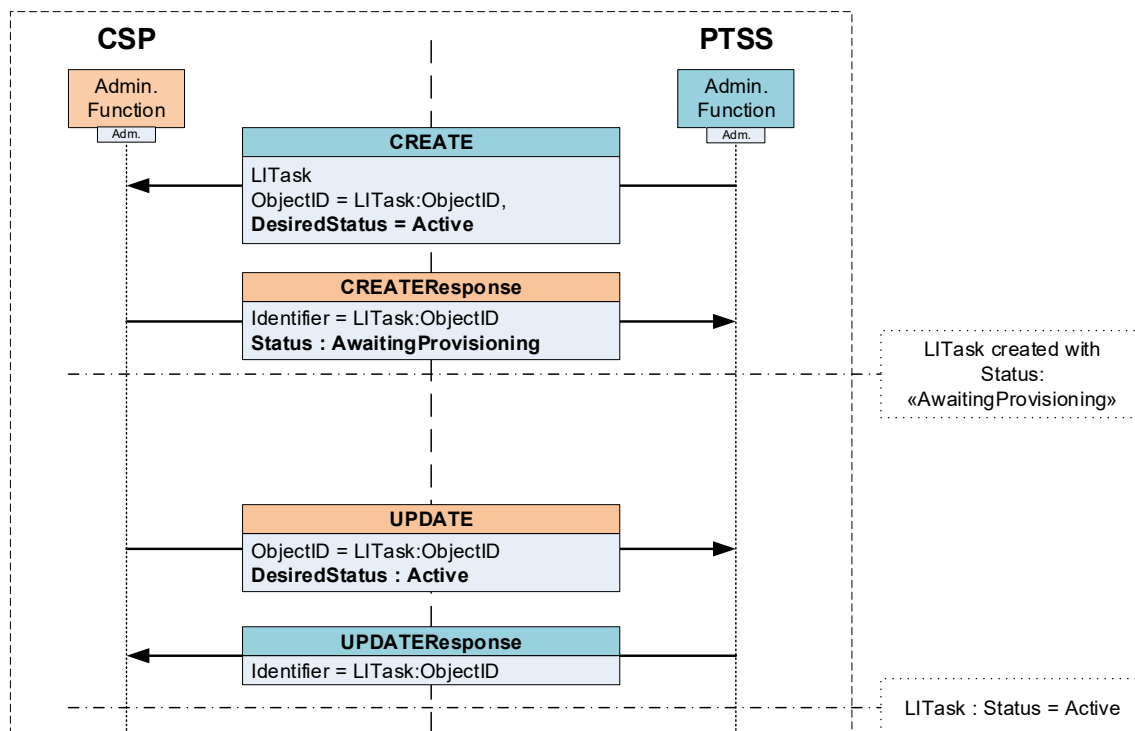


**Figure** 4-8~~8~~: **Message flow for a real-time interception deactivation instruction based on ad hoc HI1 interface**

### 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.
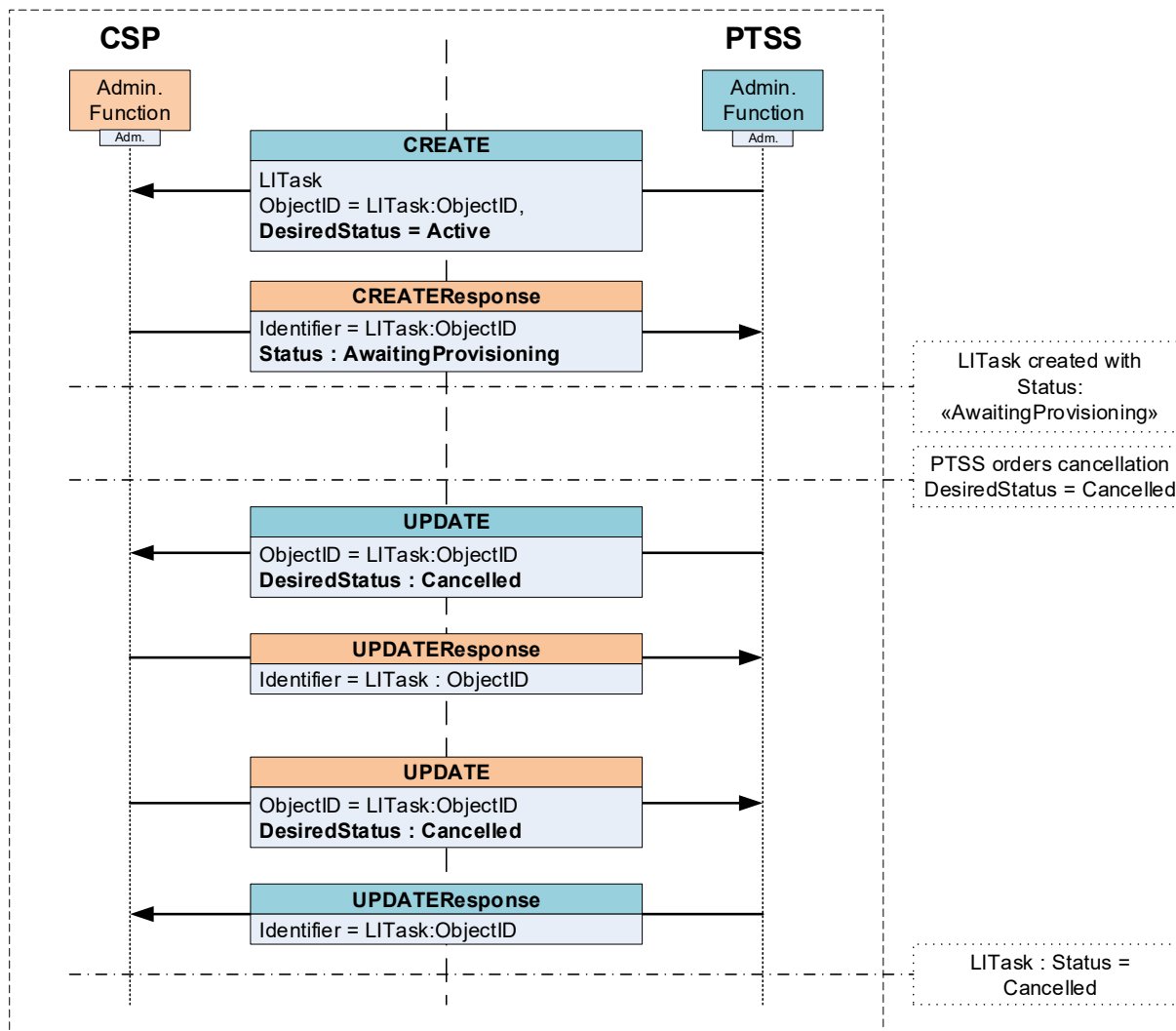


**Figure 4-9: Message flow for a real-time interception cancellation instruction based on ad hoc HI1 interface**

### 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.
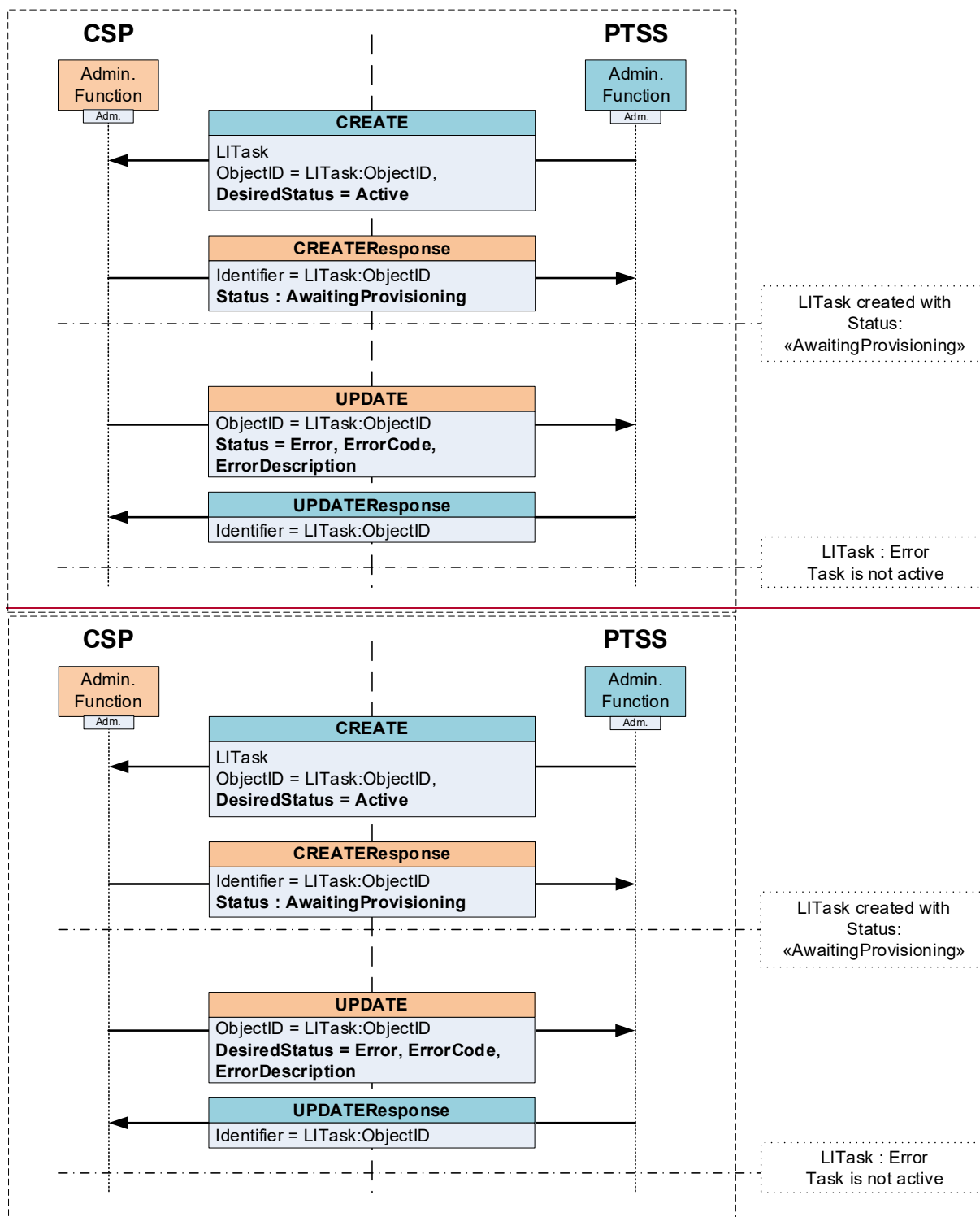


**Figure 4-10: Message flow for a real-time interception instruction in case of error or invalidity based on ad hoc HI1 interface**

### 4.2.3.8 Ad hoc HI1 interface: ETSI TS 103 120 V1.9̶3̶.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 V1.9̶3̶.1 and the exchange of simple XML messages via HTTPS process.

| Clause ETSI TS 103 120 V1.9̶3̶.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 V2.6̶3̶.1) | ~~Currently V2.0.0~~<br>PTSS_DictionaryDefinitions V2.1.0.xml |
| 6.2.4 | **UniqueIdentifier:** Unique identifier sufficient for identifying the object/field within the country. LongString | PTSS for PTSS and the CSPID for CSPs. CSPID is a 5-digit code allocated by the PTSS to each CSP in Switzerland. |
| **6.4 Action Request and Responses (request payload)** | | |
| 6.4.6 | **CREATE request** | List of the HI-1 Object fields required in the CREATE Request Messages:<br><br>**HI-1 object required fields:**<br>ObjectIdentifier<br>CountryCode<br>OwnerIdentifier<br><br>**LITask object required fields:**<br>Reference<br>DesiredStatus<br>TimeSpan<br>TargetIdentifier<br>DeliveryDetails<br>CSPID<br>Flags |
| | **CREATEResponse** | List of the HI-1 Object fields required in the CREATE Response Messages:<br><br>**HI-1 object required fields:**<br>ObjectIdentifier<br>Generation<br>LastChanged<br><br>**LITask object required fields:**<br>Reference<br>Status |
| 6.4.7 | **UPDATE request** | List of the HI-1 Object fields required in the UPDATE Request Messages:<br><br>**HI-1 object required fields:**<br>ObjectIdentifier<br><br>**LITask object required fields:** |

| Clause ETSI TS 103 120 V1.9~~3~~.1 | Available options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| | | Reference<br>DesiredStatus<br>TimeSpan |
| | **UPDATEResponse** | List of the HI-1 Object fields required in UPDATE Response Messages:<br><br>**HI-1 object required fields:**<br>ObjectIdentifier<br>Generation*<br>LastChanged*<br><br>**LITask object required fields:**<br>Reference<br><br>*Only used when the message is sent by the CSP |
| 6.4.9 | **Action Unsuccessful Information** | **ErrorCode** and **ErrorInformation** shall match values of table D.1 "Detailed error codes" of ETSI TS 103 120 V1.9~~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. |
| **8.2 LITask Object** | | |
| 8.2.3 | **Status**<br>PTSS dictionary reflects specific National PTSS Status. | **Dictionary owner:**<br>PTSS<br><br>**Dictionary Name:**<br>TaskStatus<br><br>**Dictionary authorized values:**<br>*AwaitingProvisioning*: The Task is approved, but is not yet provisioned in the LI system.<br><br>*Active*: The Task is active and can produce LI traffic.<br><br>*Cancelled*: The Task has been permanently cancelled.<br><br>*Error*: The Task is not active due to a problem with the underlying LI system or with the information in Task Object.<br><br>*Deactivated*: The Task has been deactivated by the PTSS. |
| 8.2.4 | **Desired Status** | **Dictionary owner:** |

| Clause ETSI TS 103 120 V1.9~~3~~.1 | Available options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| | PTSS dictionary reflects specific National PTSS DesiredStatus. | PTSS<br><br>**Dictionary Name:**<br>TaskDesiredStatus<br><br>**Dictionary authorised values:**<br>***AwaitingProvisioning***: The Task is approved, but is not yet provisioned in the LI system.<br><br>***Active***: The Task is active and can produce LI traffic.<br><br>***Rejected***: The Task has been explicitly denied or rejected.<br><br>***Cancelled***: The Task has been permanently cancelled<br><br>***Deactivated***: The Task has been deactivated by the PTSS.<br><br>***Error***: The Task is not active due to a problem with the underlying LI system or with the information in Task Object. |
| 8.2.5 | **TimeSpan** | **TimeSpan** is split in 5 fields detailed below:<br><br>**StartTime** is populated by the PTSS in the CREATERequest (Activation) with required interception start date and time.<br><br>**EndTime** is populated by the PTSS in the UPDATERequest (Deactivation) with required interception stop date and time. |
| 8.2.6 | **TargetIdentifier** | **Required fields:**<br>TargetIdentifierValues |
| 8.2.8 | **DeliveryDetails** | **Required fields:**<br>**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:**<br>PTSS |

| Clause ETSI TS 103 120 V1.93.1 | Available options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| | | **Dictionary Name:** DeliveryProfile<br>**Dictionary authorised values:** Production<br>Integration_1<br>Integration_2<br>PMT_Production<br>PMT_Integration_1<br>PMT_Integration_2<br>FLICC_Production<br>FLICC_Integration_1<br>FLICC_Integration_2 |
| 8.2.12 | **Flags** | **Dictionary owner:** PTSS<br>**Dictionary Name:** FlagsStatus<br>**Dictionary authorised values:** Normal<br>TEST_PTE (NOTE 1)<br>TEST_PTSA (NOTE 1)<br>TEST_PTSE (NOTE 1)<br>TEST_PTSTR (NOTE 1)<br>TEST_PTSTE (NOTE 1)<br>TEST_CTT (NOTE 1)<br>TEST_ATT (NOTE 1) |

**Table 4-164-16: Ad hoc HI-1 interface ETSI TS 103 120 V1.93.1 requirements and options**

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

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

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

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

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

Activation: PTSS➜CSP

| Create |
|---|
| **XML header section 4.2.2.8.1** |
| ee4165be-4817-11e6-beb8-9e71128cae77 |
| 2016-07-12T12:10:00.000000Z |
| XML message payload 4.2.3.9.1 |

Ack.: CSP➜PTSS

| CreateResponse |
|---|
| **XML header section 4.2.2.8.1** |
| ee4165be-4817-11e6-beb8-9e71128cae77 |
| 2016-07-12T12:10:03.000000Z |
| XML message payload 4.2.3.9.2 |

Active: CSP➜PTSS

| Update* |
|---|
| **XML header section 4.2.2.8.1** |
| b8508613-4320-4043-aa7f-2d0d818bbdb5 |
| 2016-07-13T12:00:00.000000Z |
| XML message payload 4.2.3.9.3 |

Ack.PTSS➜CSP

| UpdateResponse* |
|---|
| **XML header section 4.2.2.8.1** |
| b8508613-4320-4043-aa7f-2d0d818bbdb5 |
| 2016-07-13T12:00:10.000000Z |
| XML message payload 4.2.3.9.4 |

Deactiv.: PTSS➜CSP

| Update |
|---|
| **XML header section 4.2.2.8.1** |
| d8c14821-a4d5-4481-9076-7e3b649c9f66 |
| 2016-12-30T12:00:00.000000Z |
| XML message payload 4.2.3.9.5 |

Ack.: CSP➜PTSS

| UpdateResponse |
|---|
| **XML header section 4.2.2.8.1** |
| d8c14821-a4d5-4481-9076-7e3b649c9f66 |
| 2016-12-31T12:04:00.000000Z |
| XML message payload 4.2.3.9.6 |

Deactiv.:CSP➜PTSS

| Update* |
|---|
| **XML header section 4.2.2.8.1** |
| 3798439e-9e58-42ea-95cc-8fa887dde61a |
| 2016-12-31T15:01:00.000000Z |
| XML message payload 4.2.3.9.7 |

Ack.: PTSS➜CSP

| UpdateResponse* |
|---|
| **XML header section 4.2.2.8.1** |
| 3798439e-9e58-42ea-95cc-8fa887dde61a |
| 2016-12-31T15:10:00.000000Z |
| XML message payload 4.2.3.9.8 |

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

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

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

| ETSI TS 103 120 V1.9~~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/ DeliveryProfile/ common:Value | | |
| | DeliveryProfile dictionary owned by PTSS | Production |
| CSPID/ CountryCode | | |
| | ReceiverIdentifier | CH |
| CSPID/ UniqueIdentifier | | |
| | ReceiverIdentifier | 99908 |
| Flags/ TaskFlag/ common:Owner | | |
| | FlagStatus dictionary owned by the PTSS. ShortString (see ETSI TS 103 280 V2~~1~~.6~~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 4-174~~-17~~: Ad hoc HI-1 interface XML of a simple CREATE request payload**

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

| ETSI TS 103 120 V1.~~9~~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 4-184-18: 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)

| Element or attribute | Description | Example |
|---|---|---|
| ETSI TS 103 120 V1.93.1 Clause 6.4 Action Request and Responses | | |
| **UPDATE request LITask** | | |
| **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 4-194-19: 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)

| Element or attribute | Description | Example |
|---|---|---|
| ETSI TS 103 120 V1.93.1 Clause 6.4 | | |
| **UPDATE Response LITask** | | |
| **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 4-204-20: 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 V1.93.1 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 4-214-21: 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 V1.93.1 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 4-224-22: 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)

| Element or attribute | Description | Example |
|---|---|---|
| ETSI TS 103 120 V1.93.1 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 4-234 23: Ad hoc HI-1 interface XML of a simple UPDATE request payload (sent by CSP)**

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

| ETSI TS 103 120 V1.~~9~~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-~~244~~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):

| Element or attribute | Description | Example |
|---|---|---|
| **ETSI TS 103 120 V1.~~9~~3.1 Clause 6.4 Action Request and Responses** | | |
| **UPDATE request LITask** | | |
| **UPDATE** | | |
| **HI-1 Object** | | |
| ObjectIdentifier | UUID according to IETF RFC 4122 canonical form | 8a1a0c46-2495-46d5-82c3-1900dcecaaa6 |
| **LITask** | | |
| Reference | LIID | 201609218765432 |
| DesiredStatus/ common:Owner | TaskDesiredStatus PTSS proprietary dictionary entry and ShortString | PTSS |
| DesiredStatus/ common:Name | TaskDesiredStatus PTSS proprietary dictionary entry and ShortString | TaskDesiredStatus |
| DesiredStatus/ common:Value | TaskDesiredStatus PTSS proprietary dictionary entry and ShortString | Rejected |
| InvalidReason ErrorCode | Detailed error codes in ETSI TS 103 120 V1~~2~~.~~9~~3.1 Annex D. | 3009 |
| ErrorDescription | | Value not found in system. |

**Table 4-~~25~~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 V1.26.1)

Based on ETSI TS 102 657 V1.26.1 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 V1.26.1 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 V1.26.1 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 V1.26.1 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 V1.93.1, 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 V1.26.1, 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 V1.93.1 and an instruction form that is more easily readable by non-technical personnel.

The ETSI TS 103 120 V1.93.1 based XML structure and elements are described in details in section 4.2.2.8.

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

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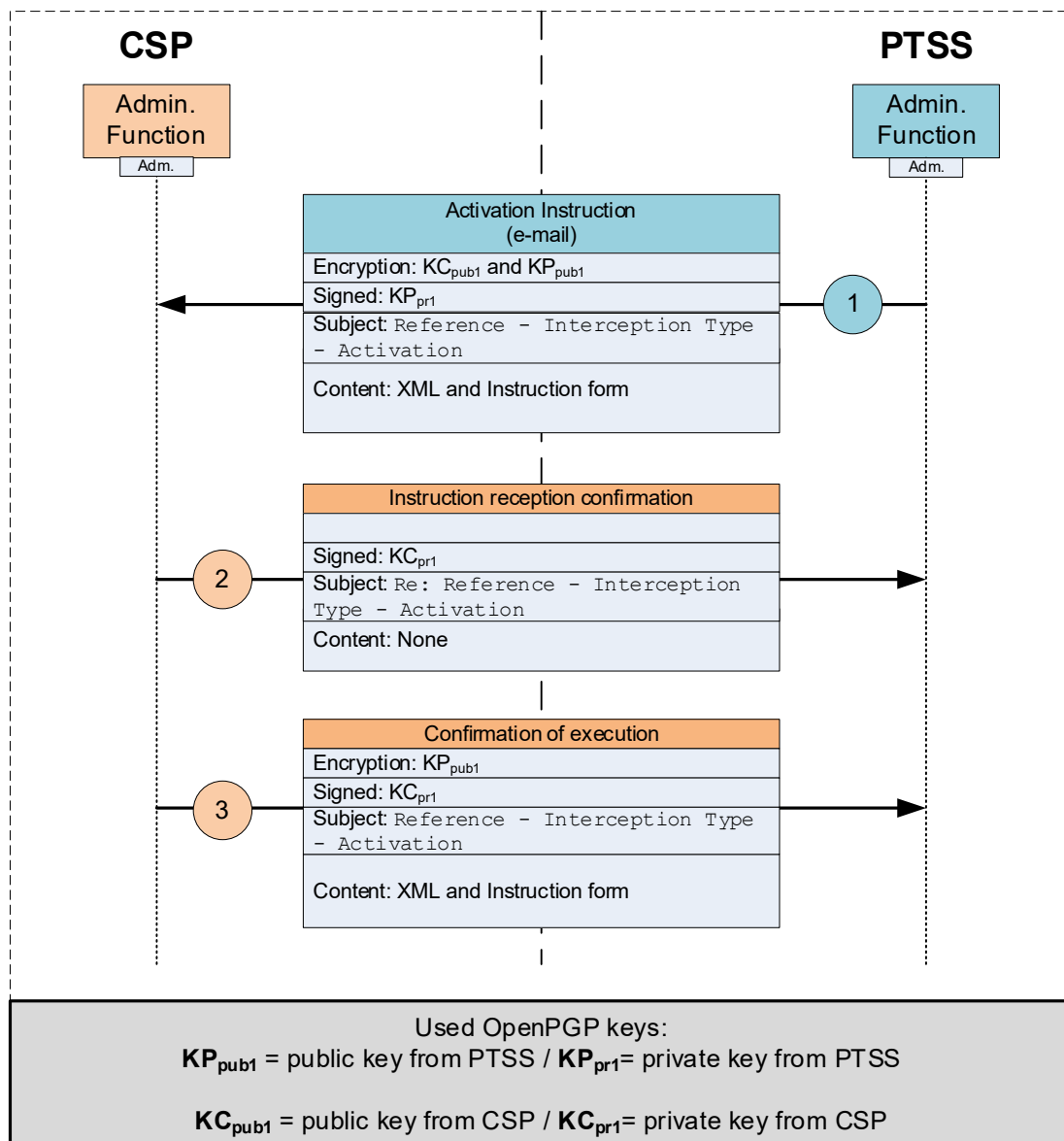


**Figure 4-12: Message flow for email activation instruction processing for real-time interceptions**

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

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

Examples of the email subject line:
```
20190608715852 – RT_22_NA_IRI – Activation
20190708715856 – RT_25_TEL_CC_IRI – Stop
```

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

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

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

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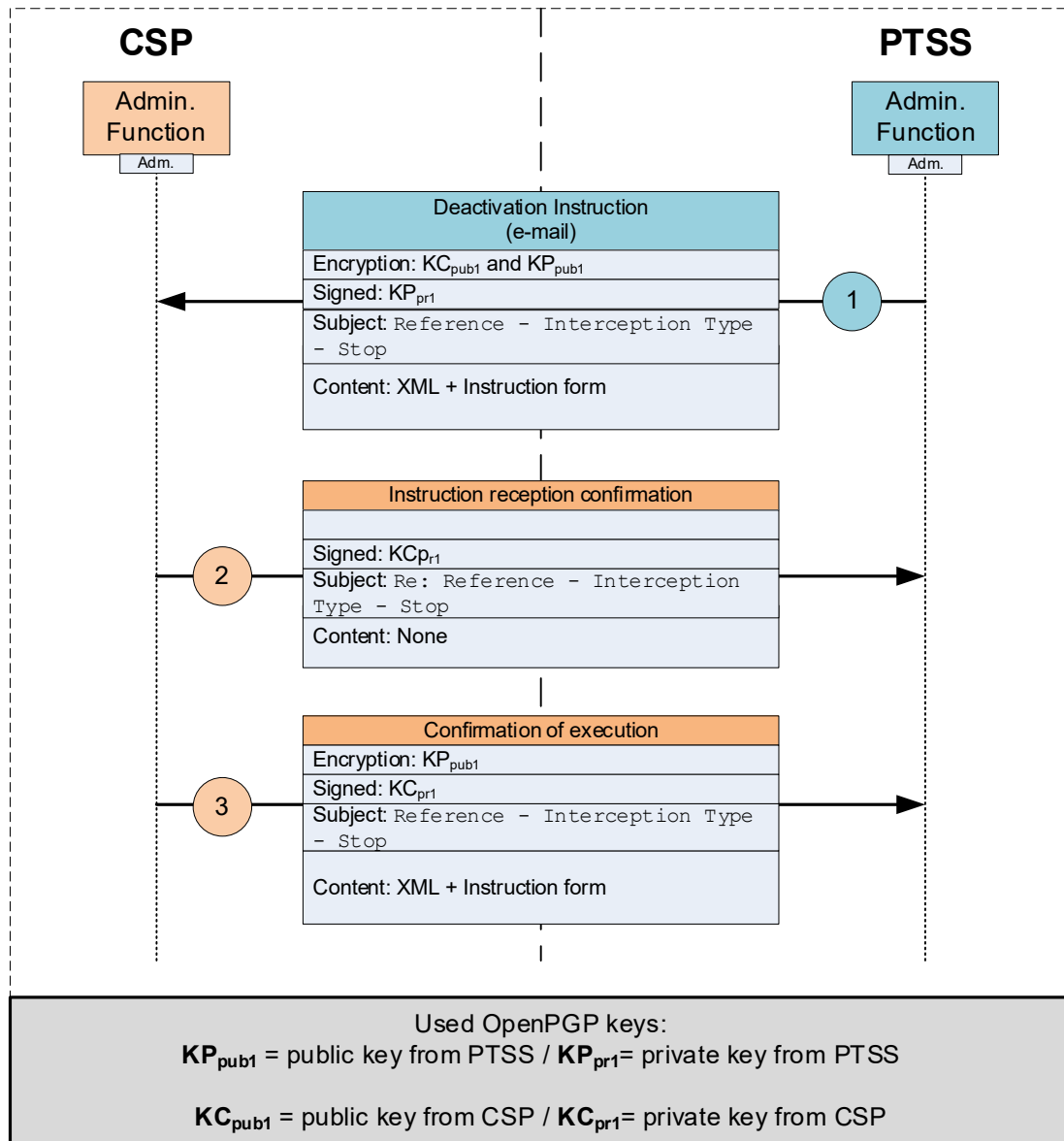


**Figure 4-13: Message flow for email deactivation instruction processing for real-time interceptions**

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

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

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

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

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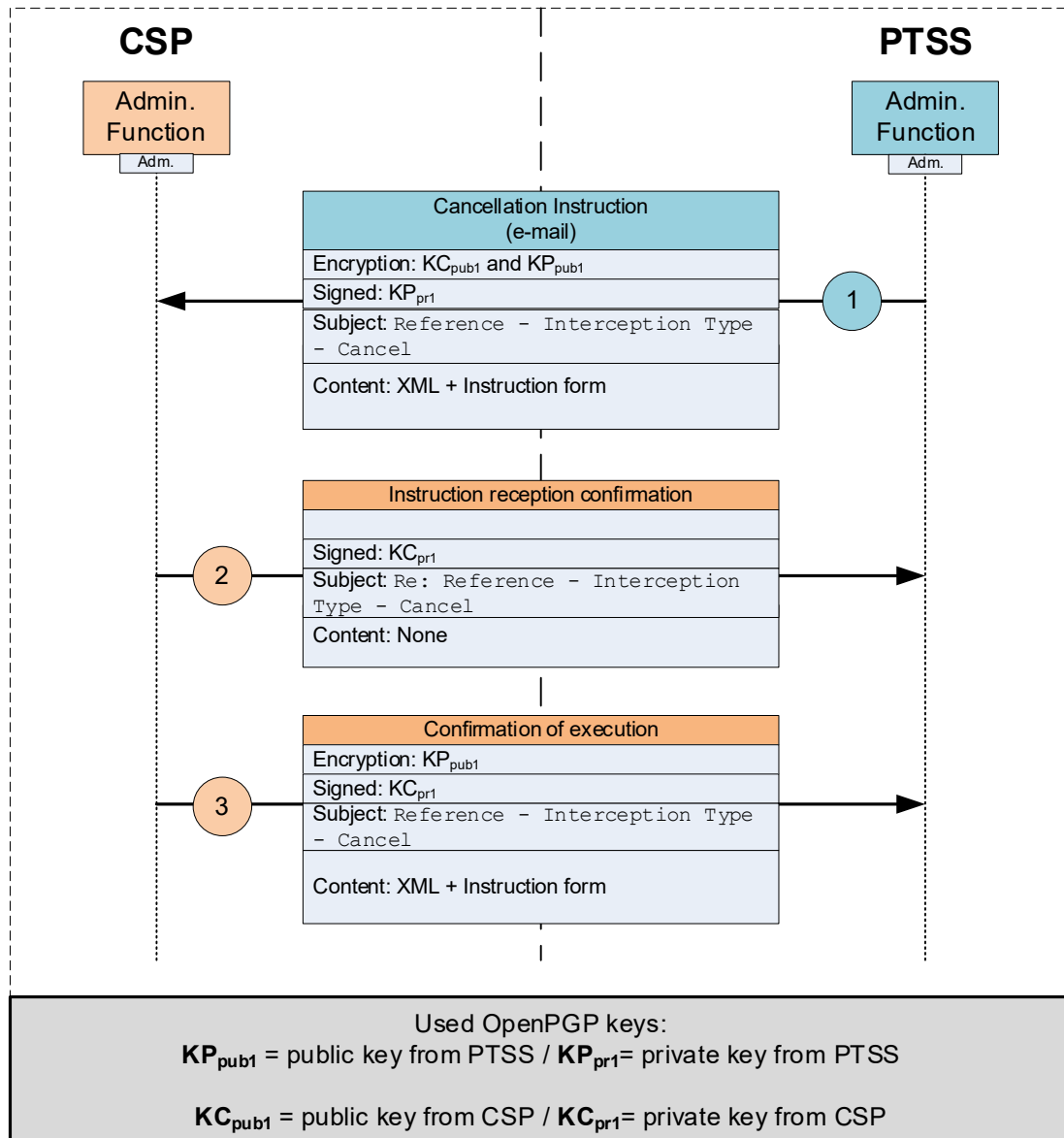


**Figure 4-14: Message flow for email cancellation instruction processing for real-time interceptions**

The PTSS may cancel an interception activation instruction that has already been sent to the CSP, as long as the CSP has not yet executed the instruction, i.e. for real-time interceptions if the interception was not yet activated in the CSP's systems.

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

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

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

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

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

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

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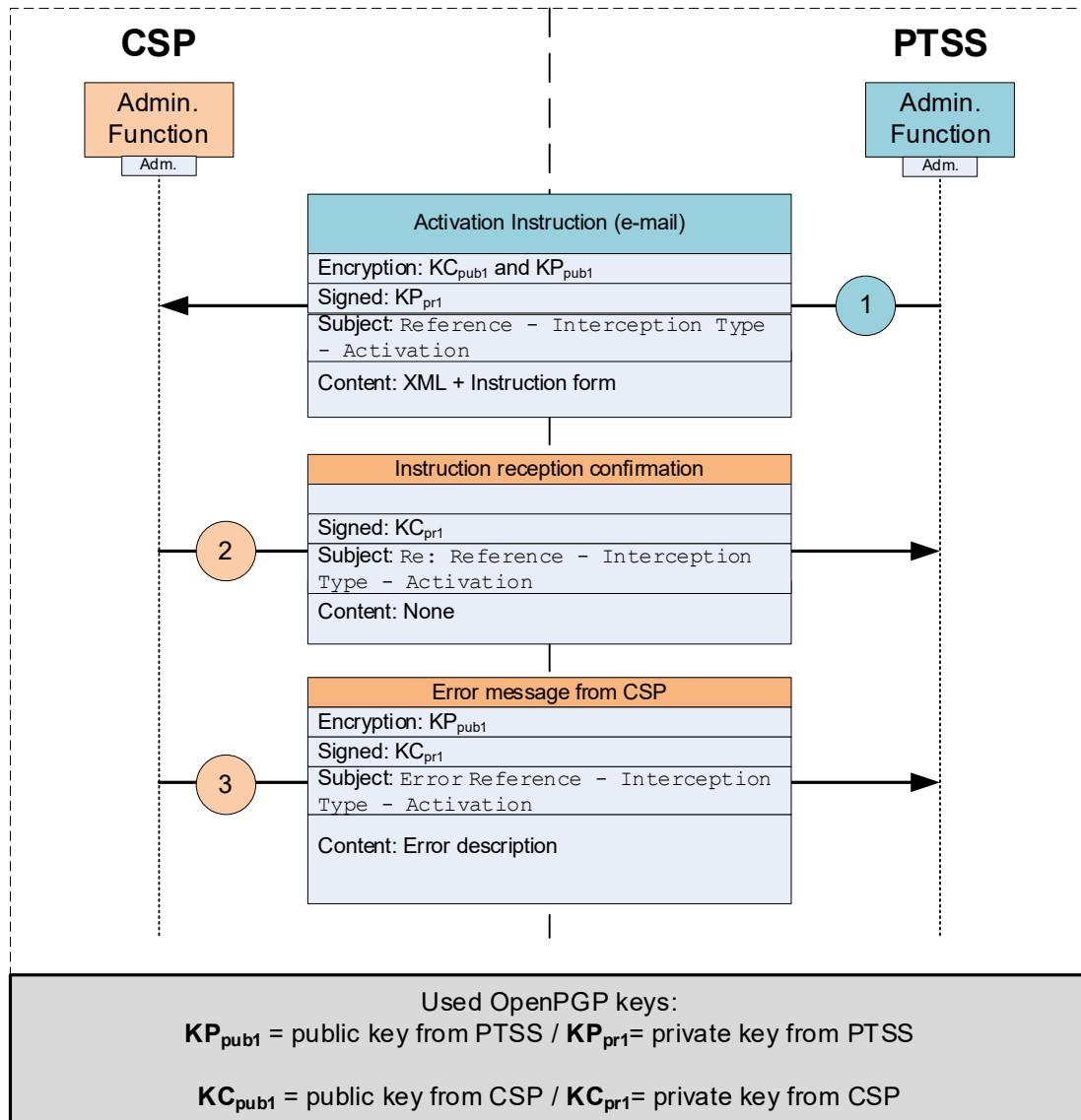


**Figure 4-15: Message flow for error of email instruction activation processing for real-time interceptions**

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

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

The HI-1 and LITask object fields only are attached to the emails. The fields remain compliant with the ETSI TS 103 120 V1.9~~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 V1.93.1 Clause 6.2 Messages header | | |
|---|---|---|
| **Element or attribute** | **Description** | **Example** |
| SenderIdentifier/ CountryCode | | |
| | ISOCountryCode (giving 3166-1 alpha-2 code | CH |
| SenderIdentifier/ UniqueIdentifier | | |
| | LongString | PTSS |
| ReceiverIdentifier/ CountryCode | | |
| | SenderIdentifier | CH |
| ReceiverIdentifier/ UniqueIdentifier | | |
| | ReciverIdentifier: CSP 5 digit code provided by the PTSS. | 99908 |
| TransactionIdentifier | UUID in IETF RFC 4122 canonical form | ee4165be-4817-11e6-beb8-9e71128cae77 |
| Timestamp | QualifiedMicrosecondDateTime | 2016-07-12T12:10:00.000000Z |
| Version/ ETSIVersion | | |
| | ShortString of the form "VX.Y.Z" (X gives major version, Y gives minor version, Z gives revision. | V1.3.1 or V1.9.1 |
| Version/ NationalProfileOwner | | |
| | National profile owner | PTSS |
| Version/ NationalProfileVersion | | |
| | ShortString | V2.10.0 |

**Table 4-264-26: Elements composing the XML header for request and response**

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

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

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

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

**Table 4-274 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 4-284-28: 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 4-294-29: 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 4-304-30: 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 4-314-31: 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 4-324-32: 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 V1.93.1 Annex D. | 3009 |
| ErrorDescription | | Value not found in system. |

**Table 4-334 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 V1.26.1.

### 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.
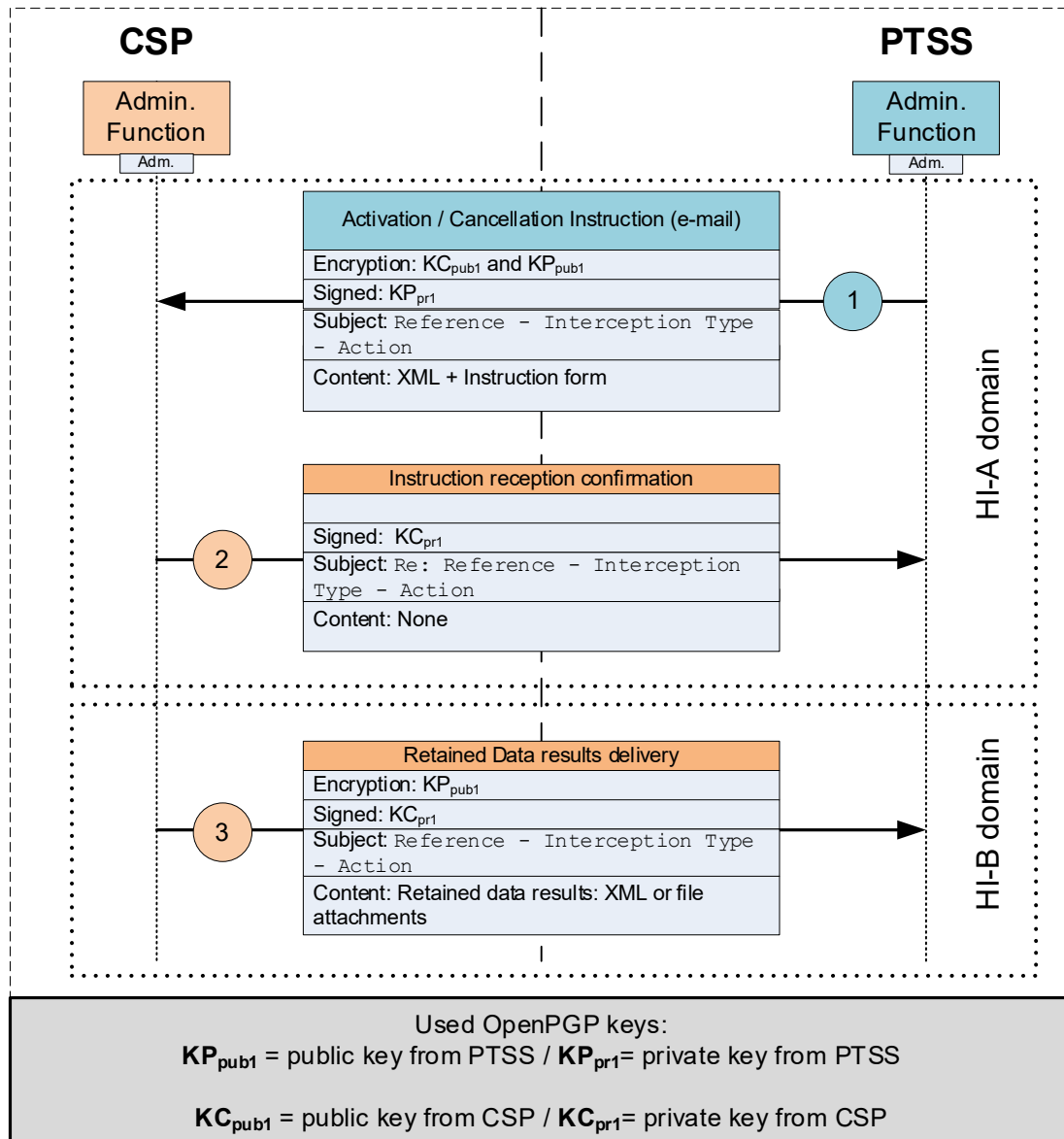


**Figure 4-17: Message flow for secure email instruction processing for retained data**

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 V1.26.1. The body and the attachments of the email are signed and encrypted with the OpenPGP keys.

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

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

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

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

### 4.3.3.2.2 Message flow for failed email instruction processing for retained data

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

### 4.3.3.2.3 Message flow for cancellation email instruction processing for retained data

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

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

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

### 4.3.4 Secure email for general and operational information notifications

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

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

#### 4.3.4.1 General purpose operational information notifications

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

If a message does not need 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 4-344-34: 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 V1.93.1 Annex C and their corresponding formats according to ETSI TS 103 280 V2.63.1 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 V16~~5.4~~5.0 or ETSI TS 102 232-1 V3.24~~19~~.1 & ETSI TS 102 232-3 V3.9~~7~~.1 or ETSI TS 102 232-7 V3.10~~6~~.1 & ETSI TS 133 128 V16~~5.8~~5.0 | 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 V16~~5.4~~5.0 or ETSI TS 102 232-1 V3.24~~19~~.1 & ETSI TS 102 232-3 V3.9~~7~~.1 or ETSI TS 102 232-7 V3.10~~6~~.1 & ETSI TS 133 128 V16~~5.8~~5.0 | 6.3  6.5.2.2  6.5.3 6.5.5  6.5.8 6.5.9 |

**Table 6~~-16~~-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 V16~~5.4~~5.0 or ETSI TS 102 232-1 V3.24~~19~~.1 & ETSI TS 102 232-5 V3.14~~1~~.1 or ETSI TS 102 232-1 V3.24~~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 | 6.3 |
| | | ETSI TS 101 671 V3.12.1 or | 6.5.1 |
| | | ETSI TS 133 108 V165.45.0 or | 6.5.2 |
| | | ETSI TS 102 232-1 V3.2419.1 & ETSI TS 102 232-5 V3.141.1 or | 6.5.3 6.5.6 |
| | | ETSI TS 102 232-1 V3.2419.1 & ETSI TS 102 232-6 V3.3.1 | 6.5.3 6.5.7 |
| 58 68 | **RT_26_EMAIL_IRI** Email services real-time interception with Interception Related Information only | Identifiers parameters | 6.3 |
| | | ETSI TS 102 232-1 V3.2419.1 & ETSI TS 102 232-2 V3.134.1 | 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 | 6.3 |
| | | ETSI TS 102 232-1 V3.2419.1& ETSI TS 102 232-2 V3.134.1 | 6.5.3 6.5.4 |

**Table 6-26-2: 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 | 6.3 |
| | | ETSI TS 101 671 V3.12.1 or | 6.5.1 |
| | | ETSI TS 133 108 V165.45.0 or | 6.5.2 |
| | | ETSI TS 102 232-1 V3.2419.1 & ETSI TS 102 232-5 V3.141.1 or | 6.5.3 6.5.6 |
| | | ETSI TS 102 232-1 V3.2419.1 & ETSI TS 102 232-6 V3.3.1 or | 6.5.3 6.5.7 |
| | | ETSI TS 102 232-7 V3.106.1 & ETSI TS 133 128 V165.84.0 | 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 | 6.3 |
| | | ETSI TS 101 671 V3.12.1 or | 6.5.1 |
| | | ETSI TS 133 108 V165.45.0 or | 6.5.2 |
| | | ETSI TS 102 232-1 V3.2419.1 & ETSI TS 102 232-5 V3.141.1 or | 6.5.3 6.5.6 |
| | | ETSI TS 102 232-1 V3.2419.1 & ETSI TS 102 232-6 V3.3.1 or | 6.5.3 6.5.7 |
| | | ETSI TS 102 232-7 V3.106.1 & | 6.5.8 |

| | | ETSI TS 133 128 V1~~65.8~~1.0 | 6.5.9 |
|---|---|---|---|

**Table 6~~-36~~-3: Emergency search real-time interception types**

| Mobile location real-time interception | | | |
|---|---|---|---|
| **VÜPF article** | **Type & Description** (Informative translation) | **Identifiers Handover Interfaces (Higher version)** | **Section** |
| 68 a | **ML_50_RT** Mobile location real-time interception is composed of subsets of the network access and the telephony and multimedia services real-time interceptions. | Identifiers parameters Specific requirements for the handover | 6.3 6.5.10 |

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

# 6.3 Common identifiers and parameters of the handover interfaces

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

## 6.3.1 Lawful Interception Identifier (LIID)

The LIID according to ETSI TS 101 671 V3.12.1 §6.1 and ETSI TS 102 232-1 V3.~~2419~~.1 §5.2.2 and ETSI TS 133 108 V15.~~65.40~~ §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 V1~~65.45~~.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 V1~~65.45~~.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 V1~~65.45~~.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 V1~~65.45~~.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 V3.24~~19~~.1 imports the `LIID` parameter from ETSI TS 103 280 V2.6~~3~~.1 and ETSI TS 133 108 V16~~5~~.4~~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 V3.24~~19~~.1 §5.2.4 and ETSI TS 133 108 V16~~5~~.4~~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 V16~~5~~.4~~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 V3.24~~19~~.1 Annex A.2 and ETSI TS 133 108 V16~~5~~.4~~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 V16~~5~~.4~~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 V16~~5~~.4~~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 V3.24~~19~~.1 and ETSI TS 133 108 V1~~65.45~~.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 V3.24~~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 V1~~65.45~~.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 V1~~65.45~~.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 V1~~65.45~~.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 V1~~65.45~~.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 V3.24~~19~~.1:

For the format of the CIN conveyed as IRI Parameter `communicationIdentityNumber`, ETSI TS 102 232-1 V3.24~~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 V1~~65.45~~.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 V16.45.0 and ETSI TS 133 128 V16.81.0 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 V16.45.0 and ETSI TS 133 128 V16.81.0:

| Service | Definition |
|---|---|
| Packet data domain (UMTS network access) | ETSI TS 133 108 V16.45.0 §6.1.3 |
| Multi-media domain | ETSI TS 133 108 V16.45.0 §7.1.3 |
| Evolved Packet System (EPS and non-3GPP access) | ETSI TS 133 108 V16.45.0 §10.1.3 |
| IMS Conference service | ETSI TS 133 108 V16.45.0 §11.1.4 |
| IMS-based VoIP Services | ETSI TS 133 108 V16.45.0 §12.1.4 |
| NR (5GS and non-3GPP access to 5GS) | ETSI TS 133 128 V16.81.0 §5.5 |

**Table 6-56-4: ETSI TS 133 108 V16.4.0 and ETSI TS 133 128 V16.8.0 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 and precision

The format of the timestamps delivered by the CSP may differ depending on the handover interface used to deliver intercepted data to the PTSS. The timestamps shall at least have a precision to the millisecond.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 V16.45.0 the timestamp can be provided either in:
  a) Local time: as `GeneralizedTime` with the `winterSummerIndication` parameter.
     or
  b) UTC time: as `GeneralizedTime.`

For the handover interface defined in ETSI TS 102 232-1 V3.24~~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 V1~~6~~5.8~~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 V1~~6~~5.4~~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 V3.24~~19~~.1 Annex A.2 or ETSI TS 133 108 V1~~6~~5.4~~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 V1~~6~~5.4~~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 V1~~6~~5.4~~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 6-66-5: FTP parameters formats**

### 6.3.9 Location and positioning 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 6-76-6: 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 methods indicated in the following tables.

| Structure | Sub-structure | Format |
|---|---|---|
| **GSMLocation** | geoCoordinates | latitude XDDMMSS.SS<br>longitude XDDDMMSS.SS<br>mapDatum wGS84<br>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 6-86-7: 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 Groups the location information shall be delivered via ETSI TS 133 108 V165.45.0 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<br>longitude XDDMMSS.SS<br>mapDatum wGS84<br>azimuth (0..359) OPTIONAL (NOTE 2) |
| | uELocationTimestamp | CHOICE<br>timestamp [0] TimeStamp,<br>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))<br>MNC NumericString (SIZE(2..3))<br>NRCellID BIT STRING (SIZE(36)) |
|---|---|---|
| | gsmLocation | latitude XDDMMSS.SS<br>longitude XDDDMMSS.SS<br>mapDatum wGS84<br>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 6-96-8: EPS location information with time of location**

For 5GS with NR as Master Cell Group and NR or E-UTRA as Secondary Cell Groups or other access type, the location information shall be delivered via ETSI TS 133 128 V165.84.0 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 V165.54.0 and the CSP OSS/BSS systems information:

| **NRLocation** structure in TS33128Payloads module | |
|---|---|
| Parameter | Format |
| tAI | pLMNID   SEQUENCE<br>  MCC   NumericString (SIZE(3))<br>  MNC   NumericString (SIZE(2..3))<br>tAC   OCTET STRING (SIZE(2..3)) |
| nCGI | pLMNID   SEQUENCE<br>  MCC   NumericString (SIZE(3))<br>  MNC   NumericString (SIZE(2..3))<br>nRCellID   BIT STRING (SIZE(36)) |
| ageOfLocationInfo | INTEGER   **(NOTE 1)** |
| uELocationTimestamp | timestamp   GeneralizedTime   **(NOTE 2)** |
| globalGNbID | pLMNID   SEQUENCE<br>  MCC   NumericString (SIZE(3))<br>  MNC   NumericString (SIZE(2..3))<br>aNNodeID   CHOICE<br>  n3IWFID   UTF8String<br>  gNbID   BIT STRING(SIZE(22..32))<br>  nGENbID   CHOICE<br>    macroNGENbID   BIT STRING (SIZE(20))<br>    shortMacroNGENbID   BIT STRING (SIZE(18))<br>    longMacroNGENbID   BIT STRING (SIZE(21))<br>  eNbID   CHOICE<br>    macroNGENbID   BIT STRING (SIZE(20))<br>    shortMacroNGENbID BIT STRING (SIZE(18))<br>    longMacroNGENbID   BIT STRING (SIZE(21))<br>  wAGFID   UTF8String<br>  tNGFID   UTF8String<br>nID   UTF8String (SIZE(11)) |
| cellSiteInformation | geographicalCoordinates   SEQUENCE   **(NOTE 3)**<br>  latitude   UTF8String~~XDDMMSS.SS~~ |

| | longitude UTF8String~~XDDDMMSS.SS~~ |
|---|---|
| | mapDatumInformation OGCURN (NOTE 4) |
| | azimuth  INTEGER (0..359) (NOTE 54) |

| |
|---|
| 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: The Open Geospatial Consortium URN used for WGS84 shall be: `urn:ogc:def:crs:OGC:1.3:CRS84` |
| NOTE 54:  When a cell is composed of several main beam directions or when it is omnidirectional the corresponding azimuth parameter shall be omitted. |

**Table 6-106 9: NRLocation structure and parameters for 5GS**

| `EUTRALocation` structure in TS33128Payloads module | |
|---|---|
| **Parameter** | **Format** |
| tAI | pLMNID   SEQUENCE<br>  MCC  NumericString (SIZE(3))<br>  MNC  NumericString (SIZE(2..3))<br>tAC  OCTET STRING (SIZE(2..3)) |
| eCGI | pLMNID   SEQUENCE<br>  MCC  NumericString (SIZE(3))<br>  MNC  NumericString (SIZE(2..3))<br>eUTRACellID  BIT STRING (SIZE(28)) |
| ageOfLocationInfo | INTEGER   (NOTE 1) |
| uELocationTimestamp | timestamp  GeneralizedTime   (NOTE 2) |
| globalNGENbID | pLMNID   SEQUENCE<br>  MCC  NumericString (SIZE(3))<br>  MNC  NumericString (SIZE(2..3))<br>aNNodeID  CHOICE<br>  n3IWFID  UTF8String<br>  gNbID  BIT STRING(SIZE(22..32))<br>  nGENbID  CHOICE<br>    macroNGENbID  BIT STRING (SIZE(20))<br>    shortMacroNGENbID  BIT STRING (SIZE(18))<br>    longMacroNGENbID  BIT STRING (SIZE(21))<br>  eNbID    CHOICE<br>    macroNGENbID     BIT STRING (SIZE(20))<br>    shortMacroNGENbID BIT STRING (SIZE(18))<br>    longMacroNGENbID  BIT STRING (SIZE(21))<br>  wAGFID  UTF8String<br>  tNGFID  UTF8String<br>nID  UTF8String (SIZE(11)) |
| cellSiteInformation | geographicalCoordinates  SEQUENCE   (NOTE 3)<br>   latitude  UTF8String~~XDDMMSS.SS~~<br>   longitude UTF8String~~XDDDMMSS.SS~~<br>   mapDatumInformation OGCURN (NOTE 4)<br>azimuth  INTEGER (0..359) (NOTE 54) |

| |
|---|
| 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: The Open Geospatial Consortium URN used for WGS84 shall be:
> `urn:ogc:def:crs:OGC:1.3:CRS84`
> NOTE 54:  When a cell is composed of several main beam directions or when it is omnidirectional the corresponding azimuth parameter shall be omitted.

**Table 6-116-10: EUTRALocation structure and parameters for 5GS**

### 6.3.9.2  VoidProvisioning 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 V165.03.0 for EPS and 3GPP TS 23.501 V165.106.0 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 V165.45.0 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 V165.05.0 clause 7.7.114.<br>NOTE 2: The UE local IP address reported over GTP based S2b interface.<br>NOTE 3: The UE UDP Port number provided in case of GTP based S2b interface. | |

**Table 6-126-11: 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 V165.45.0 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 V165.95.0 clause 8.100.<br>NOTE 2: The TWAN identifier timestamp provided in case of GTP based S2a interface. Format as in 3GPP TS 29.274 V165.95.0 clause 8.110. | |

**Table 6-136-12: Location information structure for Trusted Non-3GPP access to EPS**

For Untrusted and Trusted Non-3GPP access to 5GS the location information shall be delivered in the IRI record via ETSI TS 133 128 V165.84.0 with the ASN.1 module TS33128Payloads using the following structure and parameters:

| N3GALocation structure in TS33128Payloads module | |
|---|---|
| Parameter | Format |
| tAI | pLMNID  SEQUENCE<br>    MCC  NumericString (SIZE(3))<br>    MNC  NumericString (SIZE(2..3))<br>tAC  OCTET STRING (SIZE(2..3)) |
| N3IWFID | N3IWFIDNGAP ::= BIT STRING (SIZE(16))    (NOTE 1) |
| uEIPAddr | IPAddr SEQUENCE                              (NOTE 2)<br>    IPv4Address  OCTET STRING (SIZE(4))<br>    IPv6Address  OCTET STRING (SIZE(16)) |
| portNumber | INTEGER                                      (NOTE 3) |
| tNAPID | TNAPID  SEQUENCE<br>    sSID  UTF8String<br>    bSSID  UTF8String<br>    civicAddress  OCTET STRING |
| tWAPID | TWAPID  SEQUENCE<br>    sSID  UTF8String<br>    bSSID  UTF8String<br>    civicAddress  OCTET STRING |
| hFCNodeID | HFCNodeID  UTF8String |
| gLI | GLI  OCTET STRING (SIZE(0..150)) |
| w5GBANLineType | W5GBANLineType ENUMERATED<br>    dSL<br>    pON |
| gCI | GCI  UTF8String |
| NOTE 1: the N3IWF identifier received over NGAP and shall be encoded as a string of hexadecimal characters.<br>NOTE 2: UE local IPv4 or IPv6 address used to reach the N3IWF.<br>NOTE 3: UDP or TCP source port number. It shall be present if NAT is detected. | |

**Table 6-146-13: Location information structure for Untrusted Non-3GPP access to 5GS**

### 6.3.9.4   Requirements for the Positioning Information in 5GS

The positioning information provides the estimated position of the target UE expressed in the geographical coordinates of an ellipsoid point with an uncertainty ellipse and a confidence factor. The parameters of the geographical area description is specified in 3GPP TS 23.032 V16.0.0.

6.3.9.4.1   Requirements for the Positioning Information in UMTS and EPS

This section describes the requirements for the positioning information in the UMTS and EPS. The Positioning Information provides the estimated location of the target UE in geographical coordinates of an ellipsoid point with an uncertainty ellipse and a confidence factor.

The positioning information shall be delivered in addition to the serving cell location with the following structure and parameters:

| Location structure in EpsHI2Operations or HI2Operations modules | |
|---|---|
| Parameter | Format |
| Location | SEQUENCE |
| GSMLocation | CHOICE |
| wGS84Coordinates | OCTET STRING<br>(3GPP TS 23.032 V16.0.0 clause 7.3.3) |

**Table 6-15: Positioning information structure for UMTS and EPS**

### 6.3.9.4.2   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 of an ellipsoid point with an uncertainty ellipse and a confidence factor.

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 tThe positioning information shall be delivered in addition to the serving cell location with the following structure and parameters:

| PositioningInfo structure in TS33128Payloads module | |
|---|---|
| Parameter | Format |
| positionInfo | SEQUENCE |
| LocationData | SEQUENCE |
| locationEstimate | GeographicArea  CHOICE<br> pointUncertaintyEllipseCircle<br> (3GPP TS 29.572 V16.7.0 cl.6.1.6.2.8)<br>  geographicalCoordinates<br>    latitude  UTF8String<br>    longitude UTF8String<br>   (3GPP TS 29.572 V165.74.0 cl.6.1.6.2.4)<br>  UncertaintyEllipse  INTEGER (0..127)<br>    semiMajor<br>      Uncertainty INTEGER (0..127)<br>    semiMinor<br>      Uncertainty INTEGER (0..127)<br>    orientationMajor<br>      Orientation INTEGER (0..180)<br>   (3GPP TS 29.572 V165.74.0<br>cl.6.1.6.2.223.2)<br>  Confidence ::= INTEGER (0..100)<br>  (3GPP TS 29.572 V16.7.0 cl.6.1.6.3.2) |
| ageOfLocationEstimate | INTEGER (0..32767)<br>(3GPP TS 29.572 V165.74.0 cl.6.1.6.3.2) |
| velocityEstimate | VelocityEstimate  CHOICE<br>  HorizontalVelocity<br>    HorizontalSpeed  UTF8String<br>    Angle  INTEGER (0..360)<br>  HorizontalWithVerticalVelocity<br>    HorizontalSpeed  UTF8String<br>    Angle  INTEGER (0..360)<br>    VerticalSpeed  UTF8String |

| | | |
|---|---|---|
| | | VerticalDirection  ENUMERATED<br>    upward<br>    downward<br> HorizontalVelocityWithUncertainty<br>    HorizontalSpeed  UTF8String<br>    Angle  INTEGER (0..360)<br>    SpeedUncertainty  UTF8String<br>HorizontalWithVerticalVelocityAndUncertainty<br>    HorizontalSpeed  UTF8String<br>    Angle  INTEGER (0..360)<br>    VerticalSpeed  UTF8String<br>    VerticalDirection  ENUMERATED<br>      upward<br>      downward<br>    SpeedUncertainty  UTF8String  (hor)<br>    SpeedUncertainty  UTF8String  (vert)<br>(3GPP TS 29.572 V16.7.0 cl.6.1.6.3.2) |
| | positioningDataList | PositioningMethodAndUsage<br> PositioningMethod ENUMERATED<br>    cellID<br>    eCID<br>    oTDOA<br>    barometricPresure<br>    wLAN<br>    bluetooth<br>    mBS<br>    motionSensor<br>    dLTDOA<br>    dLAOD<br>    multiRTT<br>    nRECID<br>    uLTDOA<br>    uLAOA<br>    networkSpecific<br>(3GPP TS 29.572 V16.7.0 cl.6.1.6.3.6)<br> PositioningMode ENUMERATED<br>    uEBased<br>    uEAssisted<br>    conventional<br>(3GPP TS 29.572 V16.7.0 cl.6.1.6.3.7)<br> Usage ENUMERATED<br>    unsuccess<br>    successResultsNotUsed<br>    successResultsUsedToVerifyLocation<br>    successResultsUsedToGenerateLocation<br>    successMethodNotDetermined<br>(3GPP TS 29.572 V16.7.0 cl.6.1.6.3.9)<br>MethodCode  INTEGER (16..31)<br>(3GPP TS 29.572 V16.7.0 cl.6.1.6.2.15) |
| | gnssPositioningDataList | GNSSPositioningMethodAndUsage<br> PositioningMode ENUMERATED<br>    uEBased<br>    uEAssisted |

| | |
|---|---|
| | conventional<br>(3GPP TS 29.572 V165.74.0 cl.6.1.6.3.7)<br> GNSSID ENUMERATED<br>    gPS<br>    galileo<br>    sBAS<br>    modernizedGPS<br>    qZSS<br>    gLONASS<br>    bDS,<br>    nAVIC<br>(3GPP TS 29.572 V165.74.0 cl.6.1.6.3.8)<br> Usage<br>    unsuccess<br>    successResultsNotUsed<br>    successResultsUsedToVerifyLocation<br>    successResultsUsedToGenerateLocation<br>    successMethodNotDetermined<br>(3GPP TS 29.572 V165.74.0 cl.6.1.6.3.9) |
| eCGI | pLMNID  SEQUENCE<br>  MCC  NumericString (SIZE(3))<br>  MNC  NumericString (SIZE(2..3))<br>eUTRACellID  BIT STRING (SIZE(28)) |
| nCGI | pLMNID  SEQUENCE<br>  MCC  NumericString (SIZE(3))<br>  MNC  NumericString (SIZE(2..3))<br>nRCellID  BIT STRING (SIZE(36)) |

**Table 6-166-14: 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 V165.107.0 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 case of Non-3GPP access and if the information is available for the target, the Cellular-Network-Info header field shall also be delivered in the SIP message according to 3GPP TS 24.229 V16.10.0 Annex R.3.1.1A.

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 V165.45.0 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.~~24~~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)**<br>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.<br>Events regarding the management of an interception (e.g. activation and | See Annex 1 section 4 |

| Clause ETSI TS 101 671 V3.12.1 | Selection of ETSI options for Switzerland | Additional requirements |
|---|---|---|
| | deactivation) and error communication must be delivered. | |
| 6.2.1 | **Network identifier (NID)**<br>The NID is composed of 5 digits: NWO/AP/SvP identifier (Operator identifier).<br>PTSS provides the Operator identifier. | See Annex 1 section 6.3.2.1 |
| 8.1 | **Data transmission protocol**<br>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.).<br>ROSE is not allowed.<br>The FTP connection must be closed immediately after data transmission. | See Annex 1 section 6.3.8 |
| 11 | **Security aspects**<br>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**<br>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**<br>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**<br>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**<br>For SMS and UUS Services, CC shall be transferred as IRI.<br>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** | |

| Clause ETSI TS 101 671 V3.12.1 | Selection of ETSI options for Switzerland | Additional requirements |
|---|---|---|
| | 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**<br>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**<br>A special authentication procedure within the ISDN B Channel or within the Subaddress is not used. | |
| A.5.4 | **Multi party calls – general principles**<br>Only option A is available and must be used. | |
| A.6.3 | **Call Hold/Retrieve**<br>If an active call is put on hold, its CC link shall stay intact and the signal from the held party shall be switched through to the LEMF. If the target sets up a new call, while one call is on hold, this call shall be treated as a normal originating call (additional CC link) ETSI TS 101 671 V3.12.1 Annex A.6.3.1 applies. CC links shall stay intact and the signal from the held party shall be switched through. | |
| A.6.4 | **Explicit Call Transfer (ECT)**<br>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**<br>For CFNR, UDUB, CD and partial rerouting, option 2 (with CONTINUE-Record) must be implemented. | |
| A.6.22 | **User-to-User Signalling (UUS)**<br>UUS service data shall be delivered as IRI data. | See point A.4.2 in this Table. |
| A.8.3 | **HI3 (delivery of CC)**<br>SMS service data shall be delivered as IRI data.<br>For relating CC to the other H-Interfaces, Subaddress Service described in ETSI TS 101 671 V3.12.1 Annex E must be used. | See point A.4.2 in this Table. |

| Clause ETSI TS 101 671 V3.12.1 | Selection of ETSI options for Switzerland | Additional requirements |
|---|---|---|
| | The provider must remove any encryption algorithm applied by the CSP internally in the network at the handover interface. | |
| **Annex C: HI2 Delivery mechanisms and procedures** | | |
| C.1 / C.2 | **ROSE / FTP**<br>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**<br>For conveying IRI data transmission must be triggered neither by timeout nor by volume. File naming method B must be used. Additionally, Annex 1 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 `HI1Notificaction Operations` record used, if the `domainID` parameter exists in the `Notification` sequence, the `OBJECT IDENTIFIER` must be provided. |
| D.5 | ```MapDatum ::= ENUMERATED
            wGS84,``` | The enumerated structure `nature-Of-The-intercepted-call` is limited to the following values:<br>`gSM-ISDN-PSTN-circuit-call`<br>`gSM-SMS-Message`<br>`uMTS-circuit-call`<br>`lTE-SMS-Message`<br><br>Content of SMS in 3GPP format shall not be delivered with the `enhancedContent` structure of the `sMS-Contents` sequence. |
| D.4 to D.9 | **ASN.1 modules**<br>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**<br>Parameter assignment for CC in accordance to tables E.3.2 and E.3.4 (and the E.3.4 based example in | |

| Clause ETSI TS 101 671 V3.12.1 | Selection of ETSI options for Switzerland | Additional requirements |
|---|---|---|
| | 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 V3.12.1 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 V165.45.0 shall be used. | See Annex 1 section 6.5.2.2 |

**Table 6-176-15: 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. | | |

| Calling | Called | ISUP parameters according to ITU-T Q.699 (09/97) | | | Parameters according to ETSI TS 101 671 V3.12.1 Table E.3.5 | | |
|---|---|---|---|---|---|---|---|
| | | 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 6-186-16: 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 V165.45.0 are based on the description from the specification ETSI TS 133 107 V165.06.0 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 V16~~5~~.~~45~~.0 requirements and options for the circuit switched domain

| Clause ETSI TS 133 108 V16~~5~~.~~45~~.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 V16~~5~~.~~45~~.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 V1~~6~~5.~~4~~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**<br>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**<br>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**<br>A special authentication procedure within the ISDN B Channel or within the Subaddress is not used. | |
| 5.4.4<br>5.5.2,<br>5.5.3,<br>5.5.11 | **Multi party calls – general principles**<br>Only option A is available and must be used. | |
| 5.5.12.1.1 | **Call Diversion by target, CC links**<br>For CFNR, UDUB, CD and partial rerouting, option 2 (with CONTINUE-Record) must be implemented. | |
| 5.5.3 | **Call Hold/Retrieve**<br> 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 V1~~6~~5.~~4~~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)**<br>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)**<br>UUS service data shall be delivered as IRI data. | See points 5.3.1 in this Table. |
| 5.7 | **IP-based handover interface for CC** | |

| Clause ETSI TS 133 108 V1~~6~~5.4~~5~~.0 | Selection of ETSI options for Switzerland | Additional requirements |
|---|---|---|
| | The IP-based method to deliver the CS voice content via the module CSvoice-HI3-IP is not supported in Switzerland. | |
| **Annex A: HI2 delivery mechanisms and procedures** | | |
| A | **ROSE/FTP**<br>FTP must be used for transferring IRI data over HI2-interface; ROSE is not allowed. | |
| A.2 | **Usage of FTP for conveying IRI data**.<br>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`<br>`            wGS84,` | |
| **Annex J: Use of sub-address and calling party number to carry correlation information** | | |
| J.2.3 | **Field order and layout**<br>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 108V1~~6~~5.4~~5~~.0 Annex J.2. | |

**Table 6-19~~6-17~~: ETSI TS 133 108 V1~~6~~5.4~~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 V1~~6~~5.4~~5~~.0

ETSI TS 133 108 V1~~6~~5.4~~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 V1~~6~~5.4~~5~~.0 Annex J.2.3.1, last paragraph.

b)  All the fields according to ETSI TS 133 108 V1~~6~~5.4~~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 V165.45.0 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 V165.45.0 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 V165.45.0 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 V165.45.0 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 V165.45.0. 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 V165.45.0**

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 V165.45.0 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 V165.45.0 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 V165.45.0 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 V16~~5~~.4~~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 V16~~5.4~~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 V1~~6~~5.~~4~~5.0 requirements and options for the packet switched domain

| Clause ETSI TS 133 108 V1~~6~~5.~~4~~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 |
| 4.4.1 | **Handover interface port 2 (HI2)** The IRI records shall not be aggregated for delivery to the LEMF. | |
| 4.4.2 | **Handover interface port 3 (HI3)** The destination TCP port number at PTSS (LEMF) is provided by PTSS on a bilateral basis to each CSP. | The port number can be different for each service. (e.g. Network Access, IMS-based VoIP, PTC) |
| 4.5 | **HI2: Interface port for Interception Related Information** 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 |

| Clause ETSI TS 133 108 V165.45.0 | Selection of ETSI options for Switzerland | Additional requirements |
|---|---|---|
| **6. Packet data domain** | | |
| 6.1.2 | **Network identifier**<br>The Operator-identifier is composed of 5 digits provided by PTSS.<br>The Network-Element-Identifier (NEID) parameter shall be provided.. | |
| 6.5.1.1 | **REPORT record information**<br>Record shall be triggered:<br>- when the SGSN receives the SMS-MO from the target MS.<br>- when the SGSN receives the SMS-MT from the SMS-Centre | |
| **7. Multi-media domain** | | |
| 7 | **Multi-media domain**<br>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**<br>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.<br>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)**<br>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**<br>The Operator-identifier is composed of 5 digits provided by PTSS.<br>The Network-Element-Identifier (NEID) parameter shall be provided. | |
| 7.2.1 | **Timing**<br>IMS specific timestamp shall have a precision to the millisecond. | |
| 7.3 | **Security aspects** | |

| Clause ETSI TS 133 108 V165.45.0 | Selection of ETSI options for Switzerland | Additional requirements |
|---|---|---|
| | 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**<br>As the realisation of the IMS-based VoIP services is depending on the user equipment and the CSP network capabilities, the PTSS cannot provide meaningful guidance for the dimensioning of the target interceptions to be supported. | |
| 7.5 | **IRI for IMS**<br>The whole SIP message "`sIPMessage`" and XCAP message "`xCAPMessage`" shall be delivered to the LEMF in the IRI records.<br>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**<br>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 V165.03.0. |
| **10 Evolved Packet System (EPS)** | | |
| 10.1.2 | **Network identifier**<br>The Operator-identifier is composed of 5 digits provided by PTSS.<br>The Network-Element-Identifier (NEID) parameter shall be provided. | |
| 10.5.0 | **IRI for evolved packet domain**<br>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** | | |

| Clause ETSI TS 133 108 V165.45.0 | Selection of ETSI options for Switzerland | Additional requirements |
|---|---|---|
| 11.1.2 | The use of a single LIID for multiple target public user identities (e.g. SIP URI and TEL URI) all pertaining to the same target is required. | |
| 11.1.3 | **Network identifier** The Operator-identifier is composed of 5 digits provided by PTSS. The Network-Element-Identifier (NEID) parameter shall be provided. | |
| 11.5 | **IRI for IMS Conference Services** As mentioned in ETSI TS 133 108 V165.45.0 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 V165.45.0 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 "`lmISF`" or "`sGW`". | |
| 12.7.4 | **LI in VPLMN with LBO** The `VoIPRoamingIndication` parameter shall be set to `roamingLBO` in the IRI record. | |
| **13. Interception of Proximity Services (ProSe)** | | |
| NOTE: LI of ProSe service is only available from 3GPP Release 13. | | |
| 13.1.1.3 | **Network identifier** The Operator-identifier is composed of 5 digits provided by PTSS. The Network-Element-Identifier (NEID) parameter shall be provided. | |

| Clause ETSI TS 133 108 V165.45.0 | Selection of ETSI options for Switzerland | Additional requirements |
|---|---|---|
| 13.2.1 | **ProSe Direct Discovery**<br>The ProSe discovery events can only be intercepted when the target identity is an IMSI. | |
| 13.2.2 | **Events and information**<br>ProSe discovery events shall be delivered with the ASN.1 module `ProSeHI2Operations` via HI2. | |
| 13.3.1 | **General**<br>IRI records for the ProSe Remote UE communications shall be delivered with the ASN.1 module `EpsHI2Operations` via HI2.<br>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)**<br>NOTE: LI of GCSE service is available from 3GPP Release 13. | | |
| 14.2 | **GCS AS in Intercepting Operator's Network**<br>Only IMSI and IMEI are valid target identities to perform interceptions of GCSE services. | |
| 14.2.2.3 | **Network identifier**<br>The Operator-identifier is composed of 5 digits provided by PTSS.<br>The Network-Element-Identifier (NEID) parameter shall be provided. | |
| 14.2.7 | **CC for GCSE based Communications**<br>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**<br>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**<br>NOTE: Separated LI of messaging service is available from 3GPP Release 15. | | |
| 15.1 | **Overview** | |

| Clause ETSI TS 133 108 V1~~6~~5.~~4~~5.0 | Selection of ETSI options for Switzerland | Additional requirements |
|---|---|---|
| | 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 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.~~0~~ | **Introduction~~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. | |

| Clause ETSI TS 133 108 V16.45.0 | Selection of ETSI options for Switzerland | Additional requirements |
|---|---|---|
| A.3 | **ETSI TS 102 232-1 and ETSI TS 102 232-7**<br>The HI2 delivery method based on ETSI TS 102 232-1 and ETSI TS 102 232-7 shall not be used for all HI2 IRI records specified in ETSI TS 133 108 V16.4.0. | |
| **Annex B: Structure of data at the handover interface** | | |
| B.3 - B.16 | The supported ASN.1 Object ID and versions for Switzerland are indicated in the section 6.6. | The aggregation mechanism for IRI content shall not be used. |
| B.12 | **Contents of Communication (HI3 IMS-based VoIP).**<br>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**<br>ULIC header version 1 with TCP/IP described in Annex C.1.3 shall be used. | |
| C.1.1 | **Introduction**<br>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**<br>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**<br>Usage of FTP for conveying CC data is not supported. | |
| C.3 | **ETSI TS 102 232-1 and ETSI TS 102 232-7**<br>The HI3 delivery method based on ETSI TS 102 232-1 and ETSI TS 102 232-7 shall not be used for all HI3 content of communication specified in ETSI TS 133 108 V16.4.0. | |
| **Annex K: VoIP HI3 Interface** | | |
| K.1 | **VoIP CC Protocol Data Unit**<br>The VoIP CC Protocol Data Unit shall be delivered to the LEMF using TCP as the transport protocol. | |

| Clause ETSI TS 133 108 V1~~6~~5.~~4~~5.0 | Selection of ETSI options for Switzerland | Additional requirements |
|---|---|---|
| K.2 | **Definition of VoIP LI Correlation header**<br>Provision of the LIID.<br>Provision of the TimeStamp parameter. | The provision of the LIID is mandatory.<br>The provision of the TimeStamp parameter is mandatory. |
| K.4 | **LEMF considerations**<br>IPSec shall not be used. Consider the delivery network specifications in VD-ÜPF Annex 2 for options. | |
| **Annex L: Conference HI3 Interface** | | |
| L.1 | **Conf CC Protocol Data Unit**<br>The Conference CC Protocol Data Unit (Conf-CC-PDU) is delivered to the LEMF using TCP as the transport protocol. | |
| L.2 | **Definition of Conference LI Correlation header**<br>Provision of the TimeStamp parameter. | The provision of the TimeStamp parameter is mandatory. |
| L.3 | **Definition of Payload**<br>The delivered payload shall include the IP layer and the above protocols (IP/UDP/RTP). | |
| **Annex M: Generic LI notification (HI1 notification using the HI2 method)** | | |
| M.1 | **HI.1 delivery methods preferences:**<br>As an alternative to the `HI1-Operations` specified in ETSI TS 101 671 V3.12.1 Annex D.4 the `ThreeGPP-HI1NotificationOperations` notification method specified in this annex M can be used to report the activation and deactivation of an interception. | The use of this alternative must be agreed with PTSS. |
| M.2 | **ASN.1 description of LI management notification operation (HI1 interface)**<br>The `liActivated` or `liDeactivated` notifications are mandatory.<br>The parameters<br>`domainID`<br>`lawfulInterceptionIdentifier`<br>`communicationIdentifier`<br>`timestamp`<br>`target-Information`<br>shall also be delivered. | In the `Target-Information` sequence only the `liActivatedTime` or `liDeactivatedTime` parameters shall be provided. |

**Table 6-206-18: ETSI TS 133 108 V165.45.0 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 V3.2419.1 Handover specification for IP delivery

| Clause ETSI TS 102 232-1 V3.2419.1 | Selection of ETSI options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 5.2.1 | **Version** Because an OID is used in the ASN.1 description, a separate parameter is not necessary. | |
| 5.2.2 | **LIID** A unique value is assigned by PTSS via the HI1 interface using the mechanism specified in section 4. | |
| 5.2.3 | **Authorization country code** 'CH' must be used in Switzerland. | |
| 5.2.4 | **Communication identifier** In Switzerland, "CH" must be used as the delivery country code (DCC). The Operator identifier (part of NID) is assigned by PTSS. | PTSS provides the OperatorID composed of 5 digits. See Annex 1 section 6.3.2.1 The NEID parameter `"networkElementIdentifier"` or `"eTSI671NEID"` must be provided. |
| 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. | |
| 5.2.10 | **IRI Type** | If present, the IRI Type delivered in the header by the `iRIType` parameter of the `IRIPayload` sequence shall be identical to the IRI Type contained in the service-specific `IRIContents` structure. |

| Clause ETSI TS 102 232-1 V3.2419.1 | Selection of ETSI options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 5.2.11 | **Interception Point Identifier**<br>The delivery of the Interception Point Identifier parameter is optional. | If the `interceptionPointID` parameter is used then the `extendedInterceptionPointID` parameter shall be excluded. |
| 5.2.13 | **Extended Interception Point Identifier**<br>The delivery of the Extended Interception Point Identifier parameter is optional. | If the `extendedInterceptionPointID` parameter is used then the `interceptionPointID` parameter shall be excluded. |
| 5.2.14 | **Network Function Identifier**<br>The delivery of the Network Function Identifier parameter is optional. | |
| 6.2.2 | **Error reporting**<br>`OperatorLeaMessage` specified in ETSI TS 102 232-1 V3.2419.1 Annex A.2 must be used. | Related NID must be mentioned in the Transport Related Information (TRI) message.<br><br>CSPs shall ensure their equipment is designed to avoid a loss of CIN state and history.<br>The CINReset message shall not be used. |
| 6.2.3 | **Aggregation of payloads**<br>Aggregation of payload shall not be used. | |
| 6.2.5 | **Padding data**<br>Padding of data shall not be used. | |
| 6.3.1 | **General**<br>TCP/IP must be used. | |
| 6.3.2 | **Opening and closing of connections**<br>The described handling of unsuccessful connection establishment must be implemented. | |
| 6.3.4 | **Keep-alives**<br>Can optionally be implemented by the CSP. | The use of this option must be agreed with PTSS. |
| 6.4.2 | **TCP settings**<br>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 V3.139.1, TS 102 232-3 V3.93.1, TS 102 232-5 V3.145.1 and TS 102 232-6 V3.3.1 and TS 133 128 V165.84.0. The port number can be different for each service. |

| Clause ETSI TS 102 232-1 V3.2419.1 | Selection of ETSI options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 7.2 | **Security requirements** | Neither TLS, nor signatures, nor hash codes must be used. |
| 7.3.1 | **Test data** The capabilitiy of sending of the test data as Transport Related Information (TRI) is not mandatory. | |
| 7.3.2 | **Timeliness** | The possible use of separate managed networks must be agreed with PTSS. |
| A.2 | **ASN.1 specification** 5GC NR lawful interception IRI and CC records specified in ETSI TS 133 128 V165.84.0 are delivered via the parameters `threeGPP33128DefinedIRI` and `threeGPP33128DefinedCC` as specified in ETSI TS 102 232-7 V3.106.1 clause 15. See details in Annex 1 section 6.5.8. 5GC NR lawful interception HI4 Notification records specified in ETSI TS 133 128 V16.8.0 clause 5.6 are delivered via the parameter `HI4Payload` of the `LI-PS-PDU` module. | The delivery of the IRI and CC records specified in ETSI TS 133 128 V165.84.0 necessitates the use of the ASN.1 module `LI-PS-PDU` version 29 or a higher version. |

**Table 6-216-19: ETSI TS 102 232-1 V3.2419.1 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 V3.13~~4~~.1 Service-specific details for messaging services

| Clause ETSI TS 102 232-2 V3.13~~4~~.1 | Available options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 6.2.3 | **Email send IRI**<br>IRI data according to table 1 for the event "Email send" must always be transferred. | |
| 6.3.3 | **Email receive IRI**<br>IRI data according to table 2 for the event "Email receive" must always be transferred. | |
| 6.4.3 | **Email download IRI**<br>IRI data according to table 3 for the event "Email download" must always be transferred. | |
| 7.10 | **AAAInformation**<br>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**<br>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**<br>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**<br>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**<br>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 V3.13~~1~~.1 | Available options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 8.4 | **Messaging notification events**<br>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**<br>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**<br>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 | **SMTP** | 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. |
| Annex B | **POP3** | |
| Annex C | **IMAP** | |
| Annex D | **Messaging ASN.1** | |

**Table 6-~~226-20~~: ETSI TS 102 232-2 V3.13~~1~~.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 V3.13~~1~~.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 | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| | aAInformation | □ | □ | □ | □ | □ | □ | □ | □ | □ |
| | 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 6-236-21: ETSI TS 102 232-2 V3.131.1 parameters quick reference table**

### 6.5.5  ETSI TS 102 232-3 V3.~~9~~7.1 Service-specific details for internet access services

| Clause ETSI TS 102 232-3 V3.~~9~~7.1 | Selection of ETSI options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 4.3.1 | **Target identity**<br>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**<br>This type of Internet access is not covered by this section. | |
| 6.1 | **IRI events**<br>The IRI events ~~and HI2 attributes from ETSI TS 102 232-3 version 1.4.1 and onwards~~ and IRI message types described in Table 1 shall be used. | ~~In version 1.4.1 the event 'startOfInterceptionWithSessionActive' was added.~~ |
| 6.2.0 | **List of HI2 attributes**<br>The HI2 IRI attributes shall be delivered as listed in Table 2.<br>With regard to the NOTE 2, the user's password shall not be delivered in the `rawAAAData` attribute. | |
| 6.2.2 | **Use of location field**<br>The common parameter `Location` from ETSI TS 102 232-1 V3.24.1 clause 4.5 can be used to deliver the target's location information, when available. | |
| 6.2.3 | **Packet Data Header Reporting (PDHR)**<br>The PDHR method is not used in Switzerland. | |
| 6.2.4 | **Packet Data Summary Reporting (PDSR)**<br>The PDSR method is not used in Switzerland. | |

**Table 6-~~246~~ 22: ETSI TS 102 232-3 V3.~~9~~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 V3.1~~1~~4.1 Service-specific details for IP Multimedia Services

| Clause ETSI TS 102 232-5 V3.1~~1~~4.1 | Selection of ETSI options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 4.3 | **General Requirements**<br>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 V3.24~~19~~.1 Annex A.2 |
| | 6) No national option is mandated. | |
| 5.2.6 | **SIP Messages in IRI-only intercept**<br>If the CSP removes the content element in the TP-User-Data of a SMS conveyed with the SIP MESSAGE method, the CSP must indicate the removal of the content by using the `iRIOnlySIPMessage` parameter. | |
| 5.2.7 | **Signalling IP address information**<br>The source or destination IP addresses shall not be substituted with other IP addresses of the Signalling Server or any other element. | |
| 5.3 | **Assigning a value to the CIN**<br>Generally, for new sessions, the CIN is assigned at the first IRI or CC information.<br>If a session already exists at the time of activation of an interception measure, the CIN must be generated at the first IRI or CC message. | If a connection already exists at the time of activation of an interception measure, a copy of IRI and CC data must be captured and provided starting from the point in time when the first IRI event is detected. |

| Clause ETSI TS 102 232-5 V3.14.1 | Selection of ETSI options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 5.3.1 | **Assigning a CIN value to SIP related IRI**<br>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.<br>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**<br><br>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.<br><br>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**<br>The direction of the IMS based IRI records shall not be provided. | |
| 5.7 | **Direction for IMS sessions**<br>The direction for IMS sessions shall be provided by the means of the `sessionDirection` parameter in ETSI TS 102 232-1 V3.2419.1.<br>The parameters `combined` and not `notapplicable` shall not be used. | |
| 5.8 | **Correlation of signalling and media**<br>Signalling (SIP) and media (RTP) shall be intercepted in the same context in order to ensure a proper correlation between the SDP attributes (e.g. c=, m= and a= lines) and the RTP header, IP address, protocol port and codec. | |

**Table 6-256-23: ETSI TS 102 232-5 V3.144.1 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**<br>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 V3.24~~19~~.1 Annex A.2 and ETSI TS 102 232-6 V3.3.1 via the parameters ETSI671IRI and iRIsContent such as:<br>`PS-PDU`<br>`  payload`<br>`    iRIPayloadSequence`<br>`      iRIPayload`<br>`        iRIContents`<br>`          eTSI671IRI`<br>`            iRIsContent`<br>`              iRIContent` | When using the structure ETSI671IRI the `lawfulInterceptionIdentifier` (LIID) and the `operator-Identifier` (OPID) shall be identical in the ETSI TS 101 671 V3.12.1 IRI record and in the ETSI TS 102 232-1 V3.24~~19~~.1 `LI-PS-PDU PSHeader` sequence.<br><br>The IRI type shall be identical in the ETSI TS 101 671 V3.12.1 IRI record and in the ETSI TS 102 232-1 V3.24.1 `LI-PS-PDU IRIPayload` sequence. |

| Clause ETSI TS 102 232-6 | Selection of ETSI options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 6.2 | **CC format**<br>If the interception is performed in the ISDN or ISUP domain (Circuit switched):<br>The copy of the content of communication (CC) is delivered as audioFrame via the parameter PstnIsdnCC.<br><br>If the interception is performed in the IP domain (Packet switched):<br>The copy of the content of communication (CC) is delivered as RTP packets with UDP and IP headers by ETSI TS 102 232-1 V3.2419.1 via the parameter PstnIsdnCC.<br><br>If the UDP and IP headers are missing from the intercepted content, the `frameType` structure can be used to deliver the `applicationFrame`.<br><br>The information required for interpreting the audioFrame or RTP packets are also transferred by ETSI TS 102 232-1 V3.2419.1 via the parameter PstnIsdnIRI.<br><br>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**<br>G.711 (11/88) A-law is the default, and preferred codec (mediaAttributes = "8"). | |

**Table 6-266-24: 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 V3.106.1 Service-specific details for Mobile Services

This technical specification uses the handover techniques and ASN.1 syntax defined in ETSI TS 102 232-1 V3.2419.1.
ETSI TS 102 232-7 V3.10.1 is only used for the delivery of the IRI and CC records specified in ETSI TS 133 128 V16.8.0.

| Clause ETSI TS 102 232-7 V3.106.1 | 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 V165.84.0 | See details in section 6.5.9. |
| 15.2 | **IRI and CC format** ETSI TS 133 128 V165.84.0 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 V3.2419.1 in section 6.5.3. |
| 15.3 | **Network Function Identifier** If the Network Function Identifier (NFID) parameter is available on the LI_X2 and LI_X3 interfaces, it shall be delivered to the LEMF in the `networkFunctionIdentifier` parameter of the PSHeader of ETSI TS 102 232-1 V3.24.1. | |
| 15.4 | **Extended Interception Point Identifier** If the Interception Point Identifier (IPID) parameter is available on the LI_X2 and LI_X3 interfaces, it shall be delivered to the LEMF in the `extendedInterceptionPointID` parameter of the PSHeader of ETSI TS 102 232-1 V3.24.1. | |

**Table 6-276-25: ETSI TS 102 232-7 V3.106.1 Service-specific details for Mobile Services**

### 6.5.9 ETSI TS 133 128 V165.84.0 Protocol and procedures for Lawful Interception for 5G System

The handover interface specifications of ETSI TS 133 128 V165.84.0 are based on the description from the specification ETSI TS 133 127 V165.92.0 Lawful interception architecture and functions for the 5G System.

The architecture and concepts of the 5G System are specified in 3GPP TS 23.501 V165.106.0 and the procedures in 3GPP TS 23.502 V165.106.0. The security architecture and procedures are specified in 3GPP TS 33.501 V165.85.10.

This handover interfaces for the 3GPP-defined services provided by the 5G System uses the transport mechanisms specified in ETSI TS 102 232-1 V3.2419.1 and ETSI TS 102 232-7 V3.106.1. See details in the sections 6.5.3 and 6.5.8.

Note: The specification ETSI TS 133 128 V165.84.0 specifies also the protocols and messages of the CSP internal interfaces.

| Clause ETSI TS 133 128 V16~~5~~.8~~1~~.0 | Selection of ETSI options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| **4.General** | | |
| 4.2 | **Basic principles for internal interfaces**<br>The protocols of the internal interfaces listed in the Table 4.2-1 ~~LI_SI, LI_X1, LI_X2, LI_X_3, LI_T2, LI_T3, LI_ADMF and LI_MDF~~ are under the control of the CSP and out of scope of the present document. | |
| 4.3 | **Basic principles for external handover interfaces**<br>Implementation of the external handover LI_HI1 requires the use of ETSI TS 103 120 V1.9~~3~~.1 with the new 5GS identifiers.<br>This version of the Annex 1 does not support the LI_HIQR interface. | The IP addresses and protocol ports to be used for each external handover interface is determined from PTSS based on consultations with the CSP. The 5-Tuple of each external handover interface (LI_HI1, LI_HI2, LI_HI3, LI_HI4) may be different. |
| 4.4.2 | **CSP service type**<br>The listed service types shall be implemented by the CSP in a way that conforms to the VÜPF real-time instructions type requirements. | Depending on the CSP operated services:<br>- RT_22_NA_IRI and RT_23_NA_IRI_CC may be composed of the "Data" service type.<br>- RT_24_TEL_IRI and RT_25_TEL_IRI_CC may be composed of the "Voice", Messaging" and Push-to-Talk" service types. |
| 4.4.3 | **Delivery type**<br>Only the IRI, IRI and CC shall be supported in Switzerland | |
| 4.4.5 | **LALS Triggering**<br>This version of the Annex 1 does not support the LALS triggered location service. | |
| 4.4.6 | **Roaming interception** | Interception shall not stop when the target is roaming outbound internationally. |
| **5. Transport and Communications Protocol** | | |
| 5.2 | **Protocols for LI_X1 and LI_T interfaces**<br>These internal interfaces are under the control of the CSP and the ~~p~~protocols to be used are out of scope of the present document. | |

| Clause ETSI TS 133 128 V165.84.0 | Selection of ETSI options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 5.3 | **Protocols for LI_X2 and LI_X3**<br>These internal interfaces are under the control of the CSP and the protocols to be used are out of scope of the present document. | |
| 5.4 | **Protocols for LI_HI1**<br>The XML specified in ETSI TS 103 120 V1.93.1. | For the requirements of ETSI TS 103 120 V1.93.1 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**<br>The functions having LI_HI2 or LI_HI3 interface shall support the use of ETSI TS 102 232-1 V3.2419.1 and ETSI TS 102 232-7 V3.106.1. | For the requirements of ETSI TS 102 232-1 V3.2419.1 and ETSI TS 102 232-7 V3.106.1 refer to the present document in sections 6.5.3 and 6.5.8. |
| 5.6 | **Protocols for LI_HI4**<br>The functions having LI_HI4 interface shall support the use of ETSI TS 102 232-1 V3.2419.1. 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 tThe `LINotificationType` Aactivation and Ddeactivation events with the `appliedTargetID` and the corresponding `appliedStartTime` and `appliedEndTime` shall be delivered by the CSP. The delivery of the `LIAppliedDeliveryInformation` information is optional. |
| 5.7 | **Protocols for LI_HIQR**<br>This version of the Annex 1 does not support the LI_HIQR external interface. | |
| 5.8 | **Protocols for LI_XQR**<br>The protocols of the LI_XQR internal interface is under the control of the CSP and out of scope of the present document. | |
| 5.9 | **Protocols for LI_XER**<br>The protocols of the LI_XER internal interface is under the control of the CSP and out of scope of the present document. | |
| 5.10 | **Protocols for LI_ST**<br>The protocols of the LI_ST internal interface is under the control of the CSP and out of scope of the present document. | |

| Clause ETSI TS 133 128 V1~~6~~5.8~~1~~.0 | Selection of ETSI options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| **6.Network Layer Based Interception** Field names and descriptions are valid for internal xIRI and external IRI records as well as internal xCC and external CC data. | | |
| ~~6.2.2.2.4~~ | ~~**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.~~ | |
| 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 6.2.3.5.2 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. | |
| 6.2.3.8 | **Generation of CC over LI_HI3** If a CSP delivers CC of GTP-U packets containing other protocols than IPv4 or IPv6, it shall use the `extendedUPFCCPDU` structure over the LI_HI3 interface. | |
| ~~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.~~ | |

| Clause ETSI TS 133 128 V165.84.0 | Selection of ETSI options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| 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. | |
| 6.3 | **4G** This version of the Annex 1 does not support the delivery of the EPS 4G based IRI and CC records via the LI_HI2 and LI_HI3 external interfaces. The HI2 and HI3 interfaces specified in ETSI TS 133 108 V16.4.0 shall be used. | |
| **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. | |
| 7.2.3 | **LI at HSS** This version of the Annex 1 does not support the delivery of the HSS based IRI records via the LI_HI2 interface. The HI2 interface specified in ETSI TS 133 108 V16.4.0 shall be used. | |
| 7.3.1 | **Lawful Access Location Services (LALS)** LALS via Location Services (LCS) is not required in Switzerland. This version of the Annex 1 does not support LALS. | |

| Clause ETSI TS 133 128 V165.84.0 | 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. | |
| 7.3.3 | **Use of the Location structure** The reference datum used for a latitude and longitude given in the GeographicalCoordinates shall be identified in the `mapDatumInformation` field and specified as an Open Geospatial Consortium URN. | The WGS84 reference datum shall be used with the OGC URN: `urn:ogc:def:crs:OGC:1.3:CRS84` |
| 7.6 | **Identifier Association Reporting** This version of the Annex 1 does not support the identifier association reporting with the LI_HIQR external handover interface. | |
| Annex A | **Structure of both the Internal and External Interfaces** The applicable ASN.1 `TS33128Payloads` module version is specified in the Annex 1 section 6.6. | |

| Clause ETSI TS 133 128 V16~~5~~.8~~1~~.0 | Selection of ETSI options for Swiss applications | Additional requirements or specifications |
|---|---|---|
| Annex B | **LI Notification** Only the `notificationType` for `activation` and `deactivation` are required. The `activation` notification shall only be sent to the LEMF when the activation occurs in the CSP's ADMF.<br><br>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<br><br>The `deactivation` notification shall be composed of the fields: `notificationType` `appliedTargetID` `appliedEndTime`: CSP deactivation in the ADMF. | |

**Table 6-~~286~~ 26: ETSI TS 133 128 V15.1.0 Protocol and procedures for Lawful Interception for 5GS**

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

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

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

Because of this specificity, the designated ASN.1 structures, parameters and identifiers composing the IRI records are noted with a qualifier attribute "Mandatory" or "Conditional" with the following meaning:
"Mandatory": The ASN.1 structure, parameter or identifier must be present in the delivered ML_50_RT related IRI record.

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

### 6.5.10.1 Mobile network access requirements for ML_50_RT

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

For GERAN (2G), UTRAN (3G), E-UTRAN (4G) mobile access and Non-3GPP access to EPS the handover interface shall be based on ETSI TS 133 108 V16.4.0. The transport and delivery of the corresponding IRI records shall be configured as specified in section 6.5.2.2 with the specific ASN.1 structures, parameters and identifiers enumerated in the following table.

| ETSI TS 133 108 V16.4.0 Annex B.9 specific requirements for mobile network access ML_50_RT | |
|---|---|
| Description of the IRI record structure | Qualifier |
| The `EpsHI2Operations` IRI record header structure shall contain the following parameters and identifiers:<br>`EpsIRIContent`<br>`Hi2epsDomainId OBJECT IDENTIFIER`<br>`lawfulInterceptionIdentifier`<br>`timeStamp`<br>`initiator` | <br><br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory |
| The location or position information structure shall be delivered with one of the following structures (refer to section 6.3.9 for guidance):<br>`locationOfTheTarget`<br>`additionalCellIDs`<br>or<br>`ePSlocationOfTheTarget` | <br><br>Conditional<br>Conditional<br><br>Conditional |
| The target identifier structure (only the identifier of the target shall be delivered):<br>`partyInformation`<br>`  party-Qualifier`<br>`    gPRSorEPS-Target`<br>`  partyIdentity`<br>`    imsi`<br>`    msISDN`<br>`    nAI` | <br><br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory<br>Conditional<br>Conditional |
| The correlation, event and network identifier structures:<br>`ePSCorrelationNumber`<br>`ePSevent`<br>`networkIdentifier`<br>`    operator-Identifier`<br>`    network-Element-Identifier` | <br>Conditional<br>Conditional<br>Mandatory<br>Mandatory<br>Conditional |

**Table 6-29: ML_50_RT IRI record for mobile access based on ETSI TS 133 108 V16.4.0**

For NR (5G) mobile access and Non-3GPP access to 5GS the handover interface shall be based on ETSI TS 102 232-1 V3.24.1 and ETSI TS 133 128 V16.8.0. The transport and delivery of the corresponding IRI records shall be configured as specified in sections 6.5.3 and 6.5.9 with the specific ASN.1 structures, parameters and identifiers enumerated in the following table.

| ETSI TS 102 232-1 V3.24.1 and ETSI TS 133 128 V16.8.0 specific requirements for mobile network access ML_50_RT | |
| --- | --- |
| Description of the IRI record `PSHeader` and `Payload` structures and parameters according to ETSI TS 102 232-1 V3.24.1 | Qualifier |
| `li-psDomainId      OBJECT IDENTIFIER` | Mandatory |
| `lawfulInterceptionIdentifier` | Mandatory |
| `authorizationCountryCode` | Mandatory |
| `communicationIdentifier` | Mandatory |
| `    networkIdentifier` | Mandatory |
| `        operatorIdentifier` | Mandatory |
| `        networkElementIdentifier` | Conditional |
| `    communicationIdentityNumber` | Conditional |
| `    deliveryCountryCode` | Conditional |
| `sequenceNumber` | Mandatory |
| `timestamp` | Mandatory |
| `timeStampQualifier` | Mandatory |
| | |
| `iRIPayloadSequence` | Mandatory |
| `    iRIType` | Mandatory |
| `    timestamp` | Conditional |
| `    iRIContents` | Mandatory |
| | |
| Description of the IRIPayload record from the `TS33128Payloads` structure according to ETSI TS 133 128 V16.8.0 | |
| `IRIPayload` | Mandatory |
| `    relativeOID` | Mandatory |
| `    event` | Mandatory |
| `    targetIdentifiers` | Mandatory |
| | |
| The following `IRIEvent` structures and parameters can be delivered in the `event` schema depending on which procedure is intercepted: | |
| `registration` | Conditional |
| `    registrationType` | Mandatory |
| `    registrationResult` | Mandatory |
| `    sUPI` | Conditional |
| `    sUCI` | Conditional |
| `    gPSI` | Conditional |
| `    location                    (NOTE 1)` | Conditional |
| `or` | |
| `deregistration` | Conditional |
| `    deregistrationDirection` | Mandatory |
| `    accessType` | Mandatory |
| `    sUPI` | Conditional |
| `    sUCI` | Conditional |
| `    gPSI` | Conditional |
| `    cause` | Conditional |
| `    location                    (NOTE 1)` | Conditional |
| `or` | |

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

| | |
|---|---|
| gPSI<br>location (NOTE 1) | Conditional<br>Mandatory |
| The following `IRITargetIdentifier` structures and parameters shall be delivered in the `targetIdentifiers` schema:<br>`TargetIdentifier`<br> `sUPI`<br> `iMSI`<br> `gPSI`<br> `mSISDN`<br> `nAI` | Mandatory<br>Conditional<br>Conditional<br>Conditional<br>Conditional<br>Conditional |
| NOTE 1: The Annex 1 section 6.3.9 provides guidance about the location and positioning information ASN.1 structure and parameters. | |

**Table 6-30: ML_50_RT IRI record for mobile access based on ETSI TS 133 128 V16.8.0**

### 6.5.10.2 Multimedia and telephony requirements for ML_50_RT

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

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

| Multimedia or telephony service | Handover interface |
|---|---|
| Circuit-switched telephony and message based on GERAN (2G) or UTRAN (3G) mobile radio access technology. | ETSI TS 101 671 V3.12.1 or<br>ETSI TS 102 232-1 V3.24.1<br>ETSI TS 102 232-6 V3.3.1 |
| IMS-based VoIP multimedia session or message based on E-UTRAN (4G) mobile radio access technology and circuit-switched telephony and message based on GERAN (2G) or UTRAN (3G) mobile radio access technology using IMS Centralized Services. | ETSI TS 133 108 V16.4.0 or<br>ETSI TS 102 232-1 V3.24.1<br>ETSI TS 102 232-5 V3.14.1 |

**Table 6-31: Multimedia or telephony service handover interfaces**

For circuit-switched telephony and message using the CS handover interface based on ETSI TS 101 671 V3.12.1 Annex D.5 the transport and delivery of the corresponding IRI records shall be configured as specified in section 6.5.1.1 with the specific ASN.1 structures, parameters and identifiers enumerated in the following table.

| ETSI TS 101 671 V3.12.1 Annex D.5 specific requirements for circuit-switched telephony ML_50_RT | |
|---|---|
| Description of the `HI2Operations` IRI record structure | Qualifier |

| | |
|---|---|
| The IRI record can contain the following structures and identifiers:<br>`iRIContent`<br>`domainID`<br>`iRIversion`<br>`lawfulInterceptionIdentifier`<br>`communicationIdentifier`<br>`timestamp`<br>`intercepted-Call-Direct`<br>`intercepted-Call-State`<br>`locationOfTheTarget`<br>`partyInformation`<br>`nature-Of-The-intercepted-call`<br>`sMS` | <br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory<br>Conditional<br>Conditional<br>Mandatory<br>Mandatory<br>Conditional<br>Conditional |
| Details of the `CommunicationIdentifier` structure<br>`CommunicationIdentifier`<br>    `communication-Identity-Number`<br>    `network-Identifer`<br>       `Opertator-Identifier`<br>       `Network-Element-Identifier` | <br>Mandatory<br>Conditional<br>Mandatory<br>Mandatory<br>Conditional |
| Details of the `Location` structure (refer to section 6.3.9 for guidance):<br>`Location`<br>    `e164-Number`<br>    `globalCellID`<br>    `gsmLocation`<br>    `sAI`<br>    `tAI`<br>    `eCGI` | <br>Mandatory<br>Conditional<br>Conditional<br>Mandatory<br>Conditional<br>Conditional<br>Conditional |
| Details of the `PartyInformation` structure (only the identifers of the target shall be delivered):<br>`PartyInformation`<br>    `party-Qualifier`<br>    `partyIdentity`<br>       `imsi`<br>       `msISDN`<br>       `e-164-Format` | <br><br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory<br>Conditional<br>Conditional |
| Details of the `SMS-Report` structure:<br>`SMS-report`<br>    `communicationIdentifier`<br>    `timestamp`<br>    `sMS-Contents`<br>       `initiator` | <br>Conditional<br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory |

**Table 6-32: ML_50_RT IRI record for circuit-switched telephony based on ETSI TS 101 671 V3.12.1**

For circuit-switched telephony and message using the IP handover interface based on ETSI TS 102 232-1 V3.24.1 and ETSI TS 102 232-6 V3.3.1 the transport and delivery of the

corresponding IRI records shall be configured as specified in sections 6.5.3 and 6.5.7 with the specific ASN.1 structures, parameters and identifiers enumerated in the following table.

| ETSI TS 102 232-1 V3.24.1 and ETSI TS 102 232-6 V3.3.1 specific requirements for mobile network access ML_50_RT | |
|---|---|
| Description of the IRI record `PSHeader` and `Payload` structures and parameters according to ETSI TS 102 232-1 V3.24.1 | Qualifier |
| `li-psDomainId     OBJECT IDENTIFIER`<br>`lawfulInterceptionIdentifier`<br>`authorizationCountryCode`<br>`communicationIdentifier`<br>`   networkIdentifier`<br>`       operatorIdentifier`<br>`       networkElementIdentifier`<br>`    communicationIdentityNumber`<br>`    deliveryCountryCode`<br>`sequenceNumber`<br>`timestamp`<br>`timeStampQualifier`<br><br>`iRIPayloadSequence`<br>`    iRIType`<br>`    timestamp`<br>`    iRIContents` | Mandatory<br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory<br>Conditional<br>Conditional<br>Mandatory<br>Mandatory<br>Mandatory<br><br>Mandatory<br>Mandatory<br>Conditional<br>Mandatory |
| Description of the `IRIPayload` record from the `PstnIsdnPDU` structure according to ETSI TS 102 232-6 V3.3.1<br>`IRIPayload`<br>`    iRIType`<br>`    iRIContents`<br>`        eTSI671IRI              (NOTE 1)` | <br><br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory |
| NOTE 1: The structure `eTSI671IRI` shall be filled as indicated in Table 6-32: ML_50_RT IRI record for circuit-switched telephony based on ETSI TS 101 671 V3.12.1. | |

**Table 6-33: ML_50_RT IRI record for circuit-switched telephony based on ETSI TS 102 232-1 V3.24.1 and ETSI TS 102 232-6 V3.3.1**

For IMS-based VoIP multimedia and telephony using the IP handover interface based on ETSI TS 133 108 V16.4.0 the transport and delivery of the corresponding IRI records shall be configured as specified in section 6.5.2.2 with the specific ASN.1 structures, parameters and identifiers enumerated in the following table.

| ETSI TS 133 108 V16.4.0 Annex B.9 specific requirements for IMS-based VoIP multimedia and telephony for ML_50_RT | |
|---|---|
| Description of the `EpsHI2Operations` IRI record structure | Qualifier |
| The IRI record header structure shall contain the following parameters and identifiers:<br>`EpsIRIContent`<br>`Hi2epsDomainId OBJECT IDENTIFIER`<br>`lawfulInterceptionIdentifier`<br>`timeStamp` | <br><br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory |

| | |
|---|---|
| The location information shall be delivered with the `pANI-Header-Info` structure (refer to section 6.3.10.2 for guidance):<br>`pANI-Header-Info`<br>`    access-Type`<br>`    access-Class`<br>`    network-Provided`<br>`    pANI-Location`<br>`        raw-Location`<br>`        location`<br>`        ePSLocation` | <br><br>Mandatory<br>Conditional<br>Conditional<br>Conditional<br>Mandatory<br>Mandatory<br>Conditional<br>Conditional |
| The target identifier structure (only the identifiers of the target shall be delivered):<br>`partyInformation`<br>`  party-Qualifier`<br>`    gPRSorEPS-Target`<br>`  partyIdentity`<br>`    imsi`<br>`    msISDN`<br>`    sip-uri`<br>`    tel-uri`<br>`    iMPI` | <br><br>Mandatory<br>Mandatory<br>Mandatory<br>Mandatory<br>Conditional<br>Conditional<br>Conditional<br>Conditional<br>Conditional |
| The correlation, event and network identifier structures:<br>`ePSCorrelationNumber`<br>`networkIdentifier`<br>`    operator-Identifier`<br>`    network-Element-Identifier` | <br>Conditional<br>Mandatory<br>Mandatory<br>Conditional |

**Table 6-34: ML_50_RT IRI record for IMS-based multimedia and telephony based on ETSI TS 133 108 V16.4.0**

For IMS-based VoIP multimedia and telephony using the IP handover interface based on ETSI TS 102 232-1 V3.24.1 and ETSI TS 102 232-5 V3.14.1 the transport and delivery of the corresponding IRI records shall be configured as specified in sections 6.5.3 and 6.5.6 with the specific ASN.1 structures, parameters and identifiers enumerated in the following table.

| ETSI TS 102 232-1 V3.24.1 and ETSI TS 102 232-5 V3.14.1 specific requirements for IMS-based VoIP multimedia and telephony ML_50_RT | |
|---|---|
| Description of the IRI record `PSHeader` and `Payload` structures and parameters according to ETSI TS 102 232-1 V3.24.1 | Qualifier |

| | |
|---|---|
| `li-psDomainId      OBJECT IDENTIFIER` | Mandatory |
| `lawfulInterceptionIdentifier` | Mandatory |
| `authorizationCountryCode` | Mandatory |
| `communicationIdentifier` | Mandatory |
|     `networkIdentifier` | Mandatory |
|        `operatorIdentifier` | Mandatory |
|        `networkElementIdentifier` | Mandatory |
|     `communicationIdentityNumber` | Conditional |
|     `deliveryCountryCode` | Conditional |
| `sequenceNumber` | Mandatory |
| `timestamp` | Mandatory |
| `timeStampQualifier` | Mandatory |
| | |
| `iRIPayloadSequence` | Mandatory |
|     `iRIType` | Mandatory |
|     `timestamp` | Conditional |
|     `iRIContents` | Mandatory |
| Description of the `IRIPayload` record from the `IPMultimediaPDU` structure according to ETSI TS 102 232-5 V3.14.1 | |
| `IRIPayload` | Mandatory |
|     `iRIType` | Mandatory |
|     `iRIContents` | Mandatory |
|        `iPMMIRI` | Mandatory |
|           `iPMMIRIObjId      RELATIVE-OID` | Mandatory |
|           `iPMMIRIContents` | Mandatory |
|              `nationalIPMMIRIParameters` | Mandatory |
|                `countryCode`   (NOTE 1) | Mandatory |
|              `targetLocation` | Conditional |
|                `epsLocation`   (NOTE 2) | Conditional |
|              `additionalSignalling`   (NOTE 3) | Mandatory |
|                `sipHeaderLine`   (NOTE 4) | Mandatory |
|                `sipHeaderLine`   (NOTE 5) | Conditional |
|                `sipHeaderLine`   (NOTE 6) | Conditional |

NOTE 1: The parameter `.countryCode` shall have the value `CH` according to ISO 3166-1

NOTE 2: When delivered, the `epsLocation` structure shall be composed of the parameters and identifiers according to the requirements in the section 6.3.9.

NOTE 3: The structure `additionalSignalling` may be composed of one or several `sipHeaderLine` values.

NOTE 4: The first instance of the `sipHeaderLine` shall provide the SIP-URI or TEL-URI of the target contained in one of the SIP message header lines (e.g. `To:` or `From:` or `P-Asserted-Identiy` or `P-Called-ID` or `Additional-Identity`, etc...).

For example for a target originated session: `From: <sip:+41759998877@ims.mnc99.mcc228.3gppnetwork.org>`

NOTE 5: The second instance of the `sipHeaderLine` may be used to provide the access network information of the target with a complete copy of the `P-Access-Network-Info` SIP header line when available in the SIP message header.

NOTE 6: The third instance of the `sipHeaderLine` may be used to provide the Cellular-Network-Info of the target with a complete copy of the `P-Cellular-Network-Info` SIP header line when available in the SIP message header.

**Table 6-35: ML_50_RT IRI record for VoIP and IMS-based multimedia and telephony based on 102 232-1 V3.24.1 and ETSI TS 102 232-5 V3.14.1**

## 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 {0.4.0.2.2.4.3.165.1} | ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V165.45.0 |
| **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 V165.45.0 |
| EpsHI2Operations | {0.4.0.2.2.4.8.13.3} to {0.4.0.2.2.4.8.165.4} | ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V165.45.0 |
| Eps-HI3-PS | {0.4.0.2.2.4.9.12.0} | ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V165.45.0 |
| CONFHI2Operations | {0.4.0.2.2.4.10.13.0} | ETSI TS 133 108 V13.5.0 |

| | to {0.4.0.2.2.4.10.16.0} | to ETSI TS 133 108 V165.45.0 |
|---|---|---|
| CONF-HI3-IMS | {0.4.0.2.2.4.11.13.0} | ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V165.65.0 |
| VoIP-HI3-IMS | {0.4.0.2.2.4.12.13.0} to {0.4.0.2.2.4.12.154.1} | ETSI TS 133 108 V13.5.0 to ETSI TS 133 108 V165.45.0 |
| GCSEHI2Operations | {0.4.0.2.2.4.13.15.0} to {0.4.0.2.2.4.13.16.0} | ETSI TS 133 108 V15.5.0 to ETSI TS 133 108 V16.4.0 |
| GCSE-HI3 | {0.4.0.2.2.4.14.13.0} | ETSI TS 133 108 V15.5.0 to ETSI TS 133 108 V16.4.0 |
| ProSeHI2Operations | {0.4.0.2.2.4.15.13.0} | ETSI TS 133 108 V15.5.0 to ETSI TS 133 108 V16.4.0 |
| ThreeGPP-HI1NotificationOperations | {0.4.0.2.2.4.0.1.16.1} | ETSI TS 133 108 V16.4.0 |
| **ETSI TS 133 128** 5G System (section 6.5.9) | | |
| TS33128Payloads | {0.4.0.2.2.4.19.15.41} to {0.4.0.2.2.4.19.16.7} | ETSI TS 133 128 V15.71.0 to ETSI TS 133 128 V16.8.0 |
| **ETSI TS 102 232-1** (section 6.5.36.5.3) | | |
| LI-PS-PDU (Note 1) | {0.4.0.2.2.5.1.23} to {0.4.0.2.2.5.1.3229} | ETSI TS 102 232-1 V3.11.1 to ETSI TS 102 232-1 V3.2419.1 |
| **ETSI TS 102 232-2** (section 6.5.4) | | |
| EmailPDU (Note 1) | {0.4.0.2.2.5.2.15} to {0.4.0.2.2.5.2.187 } | ETSI TS 102 232-2 V3.9.1 to ETSI TS 102 232-2 V3.134.1 |
| **ETSI TS 102 232-3** (section 6.5.5) | | |
| IPAccessPDU (Note 1) | {0.4.0.2.2.5.3.10} to {0.4.0.2.2.5.3.143 } | ETSI TS 102 232-3 V3.3.1 ETSI TS 102 232-3 V3.97.1 |
| **ETSI TS 102 232-5** (section 6.5.6) | | |
| IPMultimediaPDU (Note 1) | {0.4.0.2.2.5.5.7} to {0.4.0.2.2.5.5.132} | ETSI TS 102 232-5 V3.5.1 ETSI TS 102 232-5 V3.144.1 |
| **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 6-366-27: 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 V1.26.1, 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 V1.26.1 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 V1.26.1 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 V1.26.1 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 V1.26.1 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 V1.26.1 Annex E.1. |

**Table 7-17-1: 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 V1.26.1. 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 V1.26.1 Annex E | 7.3 7.5 7.4.4 |

**Table 7-27-2: 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 V1.26.1 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 V1.26.1 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 V1.26.1 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 V1.26.1 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 V1.26.1 Annex D or Annex E | 7.3 7.5 7.4.8 7.4.3 7.4.4 |

**Table 7-37-3: 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 V1.26.1 Annex D or Annex E | 7.3 7.5 7.4.3 7.4.4 7.4.9 |

**Table 7-47-4: 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 V1.26.1 clauses 6.1 and 6.2

| Element or attribute | Description | Example |
|---|---|---|
| rdHeaderId | Object Identifier | 0.4.0.2.3.0.24 |
| **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. | 20160319131625Z |

| | Formatted as "GeneralizedTime" | |
|---|---|---|
| requestType | Request type provided by PTSS | HD_28_NA<br>HD_29_TEL |
| requestFlag | Parameter indicating whether the request is a normal interception or a test interception.<br>The different tests types are specified by the PTSS. | Normal<br>TEST_PTE<br>TEST_PTSA<br>TEST_PTSE<br>TEST_PTSTR<br>TEST_PTSTE<br>TEST_CTT<br>TEST_ATT |
| **retainedDataPayload** | | |
| requestMessage | | |
| requestPriority | This element specifies the priority of the request.<br>00 indicates a high priority (Urgent).<br>01 indicates a regular priority. | 00<br><br>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".<br>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.<br>A request can only ask for historical data of one target identity of one service and one category. | RequestConstraints elements:<br>equals<br>lessThanOrEqualTo<br>greaterThanOrEqualTo<br>isAMemberOf |
| deliveryPointHIB | Optional element that indicates the delivery point where the historical data must be sent to. When using the HTTPS handover interface<br>In case of delivery via secure Email, PTSS provides a long term Email address with the | URI: https://ptss-host[nn].lidn.ejpd.admin.ch/P/HIB/RDC/<br>(*where* [nn] *is a host-number defined by PTSS*). |

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

**Table 7-57-5: 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 V1.26.1 clauses 6.1 and 6.2.

| Element or attribute | Description | Example |
|---|---|---|
| rdHeaderId | Object Identifier | 0.4.0.2.3.0.24 |
|  |  |  |
| 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 7-67-6: 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 V1.26.1 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<br><br>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<br><br>and<br><br>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 V1.26.1 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<br>succeeded<br>failed<br>retried |

| protocol [MsgTransmission] | Tables C.3 |
|---|---|
| *Description and requirements* | *ELEMENTS* |
| Message transmission protocol used. | smtp<br>x400 |

| protocol [MsgStoreOperation] | Tables C.4 |
|---|---|
| *Description and requirements* | *ELEMENTS* |
| Message store manipulation protocol. | pop<br>imap<br>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.<br> Preferably in text format using the element "iPTextAddress". | 203.0.113.28<br>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.<br>The IP address can be either IPv4 or IPv6.<br> Preferably in text format using the element "iPTextAddress". | 203.0.113.28<br>2001:db8:85a3::8a2e:370:7334 |

| serverID [MsgTransmission] | Tables C.3 |
|---|---|
| *Description and requirements* | *Examples* |
| IP address of the destination of the message transmission.<br>The IP address can be either IPv4 or IPv6.<br>Preferably in text format using the element "iPTextAddress". | 198.51.100.65<br>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 V1.26.1 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 V1.26.1 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<br><br>and<br><br>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 V1.26.1 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<br>called<br>calledAssertedIdentity<br>calledApplicationServer<br>originalCalled<br>redirecting<br>multimediaNetworkIndependent<br>directory<br>broadcastReceiver<br>broadcastSender<br>originalCalling<br>forwarded-to-Party<br>connected<br>userProvidedCalling<br>roaming<br>translated<br>singlePersonalNumber<br>smsOriginator<br>smsRecipient<br>smsOriginatorTrn<br>smsRecipientTrn<br>mmsOriginator<br>mmsRecipient<br>mmsOriginatorTrn<br>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<br>sip:+41315556677@provider.ch<br>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.

When the mobile 3GPP location information is a cell composed of several antennas distributed in different geographical locations but sharing the same cell identity, a specific Location structure is specified and named "combined cell" in order to deliver all the geographical coordinates and postal locations pertaining to the antennas composing the combined cell. The "Combined cell" specific structure can be used for E-UTRAN and NR radio access technologies.

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

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

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

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

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

**1) Cell and area identity elements**

| globalCellID | Table B.11 |
|---|---|
| *Description and requirements* | *Example* |
| Cell Global Identity (CGI) serving the target. The CGI may be used for GERAN and UTRAN mobile PS network access. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets) | 22F8901D50BB59 *[in hexadecimal format]* |
| sAI | Table B.11 |
| *Description and requirements* | *Example* |
| Serving Area Identifier (SAI) is used to identify an area consisting of one or more cells belonging to the same Location Area. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+SAC(2 octets) | 22F890FEDC8212 *[in hexadecimal format]* |
| eCGI | Table B.11 |
| *Description and requirements* | *Example* |
| E-UTRAN Cell Global Identity (ECGI) serving the target in E-UTRAN mode. Only applicable for circuit switched traffic case such as SMS over SGs as specified in 3GPP TS 23.272 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 | 1822F899123422F89907654321 *[in hexadecimal format]* |

| | |
|---|---|
| Tracking Area Identifier (TAI) and the E-UTRAN Cell Global Identification (ECGI) components.<br>First octet represents the flags as specified in 3GPP TS 29.274 clause 8.21.<br>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) | |
| 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<br>*[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.<br>This element shall be used only in the context of 5G NR and Multi-RAT connectivity.<br>MCC(2 octets)+MNC(1 octet)+TAC(2 octets for E-UTRAN or 3 octets for NR) | 22F899AB56E3<br>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<br>   MCC(2 octets)+MNC(1 octet) | 22F899 |
|    nRcellID<br>   (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<br>This element shall contain:<br>- Unique non-3GPP TAI used in the PLMN. MCC(2 octets)+MNC(1 octet)+TAC(3 octets)<br>- The N3IWF identifier received over NGAP MCC(2 octets)+MNC(1 octet)+N3IWF-ID(2 octets).<br>- UE local IPv4 address (used to reach the N3IWF) or UE local IPv6 address (used to reach the N3IWF).<br>- 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 V1.26.1 Annex B.3.<br>The geographical coordinates of the antenna serving the target shall be indicated according to the WGS84 World Geodetic System.<br>When a cell is composed of several azimuth directions or when it is omnidirectional the corresponding azimuth element shall be omitted.<br><u>Elements:</u><br>latitude     [XDDMMSS.SS]<br>longitude   [XDDDMMSS.SS]<br>mapDatum<br>azimuth | <br><br><br><br><br><br><br><br><br><br><br><br><br><br>N465648.10<br>E0072650.80<br>wGS84<br>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<br>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.<br>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<br>Bärenplatz<br>Autobahn A5 km38<br>Langstrasse 15<br><br>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.<br>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<br>Zürich<br>Lugano<br><br>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 | CH<br>DE<br>FR<br>IT |

| | |
|---|---|
| shall be formated according to ISO-3166-1 (2013). | |
| **4) combined cell** | |
| extendedLocation<br>  region<br>   cornerMarks<br>    Spot<br>     **gsmLocation**<br>    Spot<br>     **postalLocation** | Specific structure to deliver the geographical coordinates and postal location elements of each antenna composing the combined cell. |
| 5) paniTime | Annex D.3 |
| General requirements | *Examples* |
| Indicates the time when the location was reported at the start of the session, at the end of the session.<br>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<br>20140615092618+0200<br>20140712161528.7+0200<br>20170710144216Z |
| 6) paniHeaderContent | Annex D.3 |
| General requirements | *Example* |
| Complete content of the P-Access-Network-Info header field.<br>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<br>3b757472616e2d63656c6c2d69642d33<br>6770703d323238303961303238303237<br>333230343b227362632d646f6d61696e<br>3d6b616c623031706373636633223b<br>2275652d69703d31302e3232342e3330<br>2e3738223b2275652d706f72743d3738<br>3031220d0a<br><br>*(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.<br>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".<br>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. | 3568431553965790F |

|  |  |
| --- | --- |
|  |  |

| reasonCause | Table D.5 |
| --- | --- |
| *Description and requirements* | *Examples* |
| In case of VoIP and IMS Multimedia telephony the SIP Reason Cause code at the end of the communication. The codes are assigned by IANA at www.iana.org.<br><br>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.<br>If DSS1 causes of ITU-T Rec. Q.850 (10/18) which are not mentioned in ITU-T Rec. Q.1912.5 (01/2018) or proprietary causes are used, the CSP shall inform PTSS about the mapping used and the corresponding description of the causes. | 410<br>200 |

| 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<br>multimediaWireless<br>multimediaNetworkIndependent<br>telephonyFixed<br>telephonyWireless<br>sMS<br>mMS |

| bearerService | Table D.5 |
| --- | --- |
| *Description and requirements* | *ELEMENTS* |
| The bearer service for the communication as MultimediaBearerService. | speech<br>data<br>fax<br>video<br>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<br>video<br>text<br>application<br>message<br>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<br>a=rtpmap:96 L8/8000<br>c=IN IP4 192.0.2.14/127/2 |
| 4) mediaInitiator | Table D.8 |
| *Description and requirements* | *Examples* |
| Media component initiator. | calling Party<br>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<br>message<br>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<br>terminating |

| reason | Table D.5 |
|---|---|
| *Description and requirements* | *Examples* |
| Text description of the call status | Answered call<br>Unsuccessful call attempt |

| smsInformation | Table D.5 |
|---|---|
| *Description and requirements* | |
| The smsInformation structure is filled in when a SMS is involved in the communication. The parameters are as follows: | |
| 1) smsEvent | Table B.7 |
| *Description and requirements* | *ELEMENTS* |
| Type of message event:<br>- Regular short message<br>- Part of a composite short message<br>- Composite short message<br>- Notification short message | shortMessage<br>shortPartMessage<br>compositeMessage<br>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).<br><br>Elements to use to indicate the SMS procedure:<br>For MO-SM submitted successfully: submitMStoSC<br>For MO-SM submitted failure: submitMStoSC<br>For MT-SM delivered successfully: deliverSCtoMS<br>For MT-SM delivery failure: deliverSCtoMS | deliverSCtoMS<br>deliverReportMStoSC<br>statusReportSCtoMS<br>commandMStoSC<br>submitMStoSC<br>submitReportSCtoMS<br>reservedMTIValue |
| 3) smsStatus | Table B.7 |
| *Description and requirements* | *ELEMENTS* |
| Status reached by the short message (SM)<br><br>Elements to use to indicate the SMS procedure status:For MO-SM submitted successfully: submitted | delivered<br>expired<br>deleted |

| For MO-SM submitted failure: incomplete-submission<br>For MT-SM delivered successfully: delivered<br>For MT-SM delivery failure: incomplete-delivery | replaced<br>submitted<br>incomplete-submission<br>incomplete-delivery<br>undeliverable<br>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:<br>- Regular multimedia message<br>- Multimedia notification message<br>- Multimedia delivery report message<br>- Multimedia read reply message | message<br>notificationMessage<br>deliveryReportMessage<br>readReplyMessage |

| 2) mmsStatus | Table B.8 |
|---|---|
| *Description and requirements* | *ELEMENTS* |
| Status reached by the multimedia message (MMS) | delivered<br>expired<br>deleted<br>replaced<br>submitted<br>undeliverable<br>passed-on<br>delivery-rejection<br>delivery-forward<br>delivery-copy<br>submission-rejection<br>submission-failure<br>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 V1.26.1 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<br>41593526987 |

| Target identity for mobile network access | | |
|---|---|---|
| **Element or attribute** | **Description** | **Example** |
| equals | Request constraint | |
| networkAccess | Service = network access | |
| naServiceUsage | Category = network access service usage | |
| naAuthID | Username used to obtain the fix or wireless network access | joe@example.com |
| naAssignedAddress | SEQUENCE OF | |
| addressSetOrRangeOrMask | CHOICE | |
| set | IP address set | |
| iPTextAddress | IPv4 or IPv6 address set | 198.51.100.25<br>2001:DB8:7401::bdd7 |
| range | Range of IP addresses | |
| prefix | | |
| iPTextAddress | IPv4 or IPv6 prefix | 172.16.10.0<br>2001:DB8:1234:: |
| subnetlength | IPv4 or IPv6 subnet length, value equal to the size in bits of the prefix | 26<br>48 |
| ePSInformation | The target identity is related to a mobile network access based on GPRS and/or EPS. | |
| iMSI | The International Mobile Subscriber Identity (IMSI) of the target.<br>(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<br><br>and<br><br>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<br>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 V1.26.1 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.<br><br>Specificities in case of Mobile PS access:<br>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.<br>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.<br>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.<br><br>Examples:<br>Visited serving network: USA, location: Washington DC<br>Local time: 1000hrs<br>UTC Time: 1500hrs<br>UTC Time Offset: 10 -15 = -5<br><br>Where dates are different, 24 hours are added to the time of the greater date.<br>Visited serving network: Australia, location: Sydney<br>Local time: 0100hrs<br>UTC Time: 1500hrs<br>UTC Time Offset: (01+24) -15 = +10<br><br>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<br>20140615092545+0200<br>20140712160841.2+0200<br>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<br>20140615132834+0200<br>20140713023403.2+0200<br>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.<br>It shall be provided as UTF8String. | a1:23:45:67:8d:5b<br>357160045577005 |

|  |  |
|---|---|
|  |  |

| naAssignedAddress | Table E.3 |
|---|---|
| The naAssignedAddress structure shall be composed of the following 2 elements: 1) set of IPAddress, 2) addressType.<br>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<br>2001:DB8:A125:C27B |
| 2) addressType | Table E.3 |
| *Description and requirements* | *ELEMENTS* |
| The type of IP address. | unknown<br>internal<br>external |

| Location and additionalLocations | Table E.3 |
|---|---|
| *General  requirements* |  |
| The location information corresponds to the location of the cell antenna serving the mobile PS target or the location of the access point serving a target by wireless lan (wlan). The location information at the beginning and at the end of the session as well as, when available, during the session must be provided for each network access session that took place within the period for which historical data was requested. The location information during and at the end of the session must be provided with the additionalLocations element or with the location information provided by the NAS messages as specified in 7.4.4.2.1.<br><br>When the mobile 3GPP location information is a cell composed of several antennas distributed in different geographical locations but sharing the same cell identity, a specific Location structure is specified and named "combined cell" in order to deliver all the geographical coordinates and postal locations pertaining to the antennas composing the combined cell. The "Combined cell" specific structure can be used for E-UTRAN and NR radio access technologies.<br><br>The location information structure may be composed of six~~five~~ main information structures: 1) Cell and area identity, 2) Geographical coordinates, 3) Postal location, 4) Combined cell 5) maritimeTransport and 5~~6~~) airTransport.<br><br>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.<br><br>Depending on the network access technology used by the target, the following location information elements and fields may be delivered in the session records:<br>Mobile PS network access:<br> GERAN radio access technology:<br>   1) Cell and area identity elements: globalCellID or userLocationInformation |

2) Geographical coordinates elements: gsmLocation

3) Postal location elements: any available field

4) Maritime transport

5) Air transport

UTRAN radio access technology:

1) Cell and area identity elements: globalCellID and/or sAI or userLocationInformation

2) Geographical coordinates elements: gsmLocation

3) Postal location elements: any available field

4) Maritime transport

5) Air transport

E-UTRAN radio access technology:

1) Cell and area identity elements: userLocationInformation

2) Geographical coordinates elements: gsmLocation

3) Postal location elements: any available field

4) Combined cell

45) Maritime transport

56) Air transport

NR radio access technology:

1) Cell and area identity elements: nCGI, trackingAreaIdentifier

2) Geographical coordinates elements: gsmLocation

3) Postal location elements: any available field

4) Combined cell


Non-3GPP access to 5G core stand-alone:

1) Access identity elements: n3gppaLocation

2) Geographical coordinates elements, if available: gsmLocation

3) Postal location elements, if available: any available field


Wireless LAN network access:

Wi-Fi® hotspot access:

1) Basic Service Set Identification (BSSID)

2) Geographical coordinates elements, if available: gsmLocation

3) Postal location elements, if available: any available field

4) Maritime transport

5) Air transport


Wireline network access:

Cable modem, xDSL, FTTx access:

3) Postal location elements, if available: any available field

| **1) Cell and area identity elements** | |
|---|---|
| globalCellID | Table B.11 |
| *Description and requirements* | *Example* |
| Cell Global Identity (CGI) serving the target. The CGI may be used for GERAN and UTRAN mobile PS network access.<br>MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets) | 22F8901D50BB59<br>*[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. | 22F890FEDC8212<br>*[in hexadecimal format]* |

| | |
|---|---|
| MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+SAC(2 octets) | |
| 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.<br>First octet represents the flags as specified in 3GPP TS 29.274 clause 8.21.<br>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)<br>Alternatively, this element can also be used for providing the area and cell identity~~ies~~ for GERAN or UTRAN network access. In this case there is no need to provide the globalCellID or sAI fields in the Location structure. | 1822F899123422F89907654321<br>*[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.<br>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<br>*[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<br>[MCC(2 octets)+MNC(1 octet)] | 22F899 |
| nRcellID<br>[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.<br>This element shall be used only in the context of 5G NR and Multi-RAT connectivity.<br>MCC(2 octets)+MNC(1 octet)+TAC(2 octets for E-UTRAN or 3 octets for NR) | 22F899AB56E3<br>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 | NAS<br>CDR |

| location information is taken from the Charging Data Records. | |
|---|---|
| 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<br>This element shall contain:<br>- Unique non-3GPP TAI used in the PLMN. MCC(2 octets)+MNC(1 octet)+TAC(3 octets)<br>- The N3IWF identifier received over NGAP. MCC(2 octets)+MNC(1 octet)+N3IWF-ID(2 octets).<br>- UE local IPv4 address (used to reach the N3IWF) or UE local IPv6 address (used to reach the N3IWF).<br>- 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 V1.26.1 Annex B.3.<br>The geographical coordinates of the antenna serving the target shall be indicated according to the WGS84 World Geodetic System.<br>When a cell is composed of several azimuth directions or when it is omnidirectional the corresponding azimuth element shall be omitted.<br><u>Elements:</u><br>latitude     [XDDMMSS.SS]<br>longitude    [XDDDMMSS.SS]<br>mapDatum<br>azimuth | <br><br><br><br><br><br><br><br><br><br><br><br>N465648.10<br>E0072650.80<br>wGS84<br>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<br>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.<br>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<br>Bärenplatz<br>Autobahn A5 km38<br>Langstrasse 15<br><br>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.<br>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<br>Zürich<br>Lugano<br><br>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<br>DE<br>FR<br>IT |
| **4) combined cell** | |
| extendedLocation<br>  region<br>   cornerMarks<br>    Spot<br>     **gsmLocation**<br>    Spot<br>     **postalLocation** | Specific structure to deliver the geographical coordinates and postal location elements of each antenna composing the combined cell. |
| **4~~5~~) maritimeTransport** | |
| shipname | Table B.11 |
| *Description and requirements* | *Example* |
| Registered ship name. | LORD OF THE SEAS |
| imoNumber | |
| *Description and requirements* | *Example* |
| International Maritime Organization (IMO) ship number: IMO prefix with 7-digit number. | IMO7812345 |
| **5~~6~~) airTransport** | |
| iATAAirlineCode | Table B.11 |
| *Description and requirements* | *Examples* |
| Two-character designation code assigned to the airline by the International Air Transport Association (IATA). | LX<br>WK |
| iCAOOperatorCode | |
| *Description and requirements* | *Example* |
| Three-letter designation code assigned to the aircraft operator agency by the International Civil Aviation Organization (ICAO).<br>The iCAOOperatorCode should be used only when the aircraft operator does not have an assigned IATA airline code. | SWR<br>EDW |
| aircraftRegistration | |
| *Description and requirements* | *Examples* |
| Aircraft identification as in the aircraft's certificate of registration. | HB-JMG<br>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 EPSgprs 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. | 228993035511773F |

| (IMSI is 15 digits long + last digit "F" as a filler half-octet) | |
|---|---|
| 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<br>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<br>private.vpn.mobilecsp<br>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)<br>02 (=IPv6)<br>03 (=IPv4v6)<br>*[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.<br>Preferably in text format using the element "iPTextAddress". | 198.51.100.121<br>10.1.100.200<br>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)<br>2  (=GERAN)<br>3  (=WLAN) |

| | |
|---|---|
| | 4 (=GAN)<br>5 (=HSPA Evolution)<br>6 (=E-UTRAN) |

| fiveGSInformation | Table E.3 |
|---|---|
| Information specific to 5G System access to be used for NR mobile PS network access.<br>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.<br>Note: The DNN is equivalent to the APN in EPS. | internet.mobilecsp<br>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. | 252-19CDE0<br>29 |

| | |
|---|---|
| It is made of SST (the Slice/Service Type) and of the optional SD (the Slice Differentiator).<br>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.<br>Values 0 to 127 correspond to the standardized SST range. Values 128 to 255 correspond to the Operator-specific range.<br>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<br>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<br>See 3GPP TS 32.291 V15.3.0 Table 6.1.6.2.2.9-1. | PrivateNet<br>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<br>See 3GPP TS 32.291 V15.3.0 clause 6.1.6.2.2.8. | iPv4<br>iPv6<br>unstructured<br>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<br>sSCMode2<br>sSCMode3MultiPDUSession<br>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.<br>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.<br>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<br>+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,<br>eutra,<br>wlan,<br>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).<br>Note 1: The MAC address of the target, if available, is given in the "naDeviceID" structure.<br>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<br>*[in hexadecimal format]* |
| 2) sSID | Table E.5B |
| *Description and requirements* | *Example* |
| The Service Set Identifier in a human readable format.<br>If available. | CSPXY-FREE-WIFI |
| 3) username | Table E.5B |
| *Description and requirements* | *Example* |
| Username as seen and recorded by the CSP.<br>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<br>populated as lat/long, grid reference with the "gsmLocation" structure:<br>latitude     [XDDMMSS.SS]<br>longitude    [XDDDMMSS.SS]<br>mapDatum<br><br>and/or<br><br>the postal address with the "postalLocation" structure:<br>buildingNumber<br>streetName<br>postalCode<br>city | <br><br><br><br>N465648.10<br>E0072650.80<br>wGS84<br><br><br><br><br><br>40<br>Rue Lieu<br>9999<br>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<br>authenticationByCookie<br>authenticationByMACAddress<br>authenticationByEAPSIM<br>authenticationByUsernameAndPassword<br>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.<br>(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 V1.26.1 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. In addition, the CSP can optionally indicate the origin of the message by adding the values "NETWORK" when the NAS message is originated by the core network or "UE" when the message is originated by the user equipment. |

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

| Element | Description |
| --- | --- |

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

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

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

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

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

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

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

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

### 7.4.5  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 with the requested elements specified in section 7.4.5.1 electronically via the administrative interface. | HI-A according to ETSI TS 102 657 V1.26.1 or Secure Email |
| 2 | Conditional: (see NOTE 1) PTSS contacts the CSP by telephone and provides the known information of the instruction and target. | Telephone |
| 3 | Conditional: (see NOTE 1) CSP performs the lookup in its information systems in order to retrieve the requested information and provide this information to the PTSS by telephone. | Telephone |
| 4 | CSP confirms to the PTSS by secure email the set of information and parameters in a table put in the body of the secure email. The information and parameters of the table are specified in the layout in section 7.4.5.2. The secure email subject field shall be composed of the request number and the request type taken from the instruction and the suffix "Response", such as: `HD_20200505715852 – EP_35_PAGING – Response` | Secure email (see NOTE 2) |
| NOTE 1: The steps 1 and 2 using telephone are conditional and only necessary when the HD_31_PAGING and EP_35_PAGING interception processes require manual steps. PTSS specifies based on consultations with the CSP if the steps 2 and 3 shall be implemented. NOTE 2: The secure email address for the delivery of the response is provided by PTSS to the CSP after having consulted them. | | |

**Table 7-77-7: 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<br>tel:+41598889988<br>41598889988 |
| iMSI | The International Mobile Subscriber Identity (IMSI) of the target.<br>(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.<br>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. | 3568431553965710<br>359040082042280F |

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

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

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

| Parameters names | Comments | Examples |
|---|---|---|
| **Zielidentität / Identité de la cible** | | |
| MSISDN | Mandatory | 4177XXXXXXX |
| GPSI | Conditional | 4177UUUUUUU |
| IMSI | Conditional | 22899YYYYYYYYYY |
| SUPI | Conditional | 22899VVVVVVVVVV |
| IMEI | Conditional | 354449ZZZZZZZZ |
| PEI | Conditional | 354449WWWWWWWW |
| **Netzzugang / Accès réseau** | | |
| RADIO ACCESS TECHNOLOGY / FREQUENCY | Technology (GSM or UMTS or LTE or NR) and Frequency band in MHz of the primary node. | UMTS900<br>LTE1800<br>NR3500<br>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<br>2001:DB8::122 |
| PORT NUMBER | Used only when available in case of WLAN access | 48256 |
| **Letzter Zellstandort / Dernière localisation de cellule** | | |
| DATE TIME | Date and Local time as DD.MM.YYYY HH:MM:SS | 11.09.2016 15:39:05 |

| | | |
|---|---|---|
| LAC (DECIMAL) | Conditional: GERAN & UTRAN / format: without MCC/MNC and no leading zeros | 22300 |
| CI (DECIMAL) | Conditional:GERAN & UTRAN / format: without MCC/MNC and no leading zeros | 60773 |
| TAC (DECIMAL) | Conditional: E-UTRAN & NR format: without MCC/MNC and no leading zeros | 4343<br>1111889 |
| ENB+CI (DECIMAL) | Conditional: E-UTRAN /format: without MCC/MNC and no leading zeros | 17787394 |
| GNB+CI (DECIMAL) | Conditional: NR / format: without MCC/MNC and no leading zeros | 4553573042 |
| CELL AZIMUTH | Conditional: Multiple azimuths and attributes (tun, inh) if necessary for complex cells | inh, 60 |
| CELL CIVIC ADDRESS | Civic address in one field | Rue du Caudray 6 1020 Renens |
| CELL 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 7-87-8: Method 1 - Pparameters to be delivered for the last active location**

Method 2: The last active location can be delivered via the HI-B interface according to ETSI TS 102 657 V1.26.1 Annexes A and E. Prior to its implementation, this method 2 must be determined by the PTSS based on consultations with the CSP.

| Structure of response of the reference network access session (Mobile or WLAN) | | |
|---|---|---|
| **Element or attribute** | **Description** | **Example** |
| networkAccess | Service = network access | |
| naServiceUsage | Category = network access service usage | |
| **Structure to provide the last network access time and IP address** | | |
| naAccessTime | GeneralizedTime | 20191109134308.129Z |
| NAAssignedAddress | SEQUENCE | |
| addressSetOrRangeOrMask | SEQUENCE | |
| IPaddressSetOrRangeOrMask | CHOICE | |
| set | SEQUENCE OF | |
| IPAddress | CHOICE | |
| iPTextAddress | | 198.51.100.25<br>2001:DB8:7401::bdd7 |

| | | |
|---|---|---|
| portNumber | | 42549 |
| **Structure to provide the last location information and the transmitter details** | | |
| location | SEQUENCE | |
| globalCellID | Cell Global Identity (CGI) serving the party of the reference call. The CGI may be used for GERAN and UTRAN mobile PS network access. MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets) | 22F8901D50BB59 *[in hexadecimal format]* |
| gsmLocation | CHOICE | |
| geoCoordinates | SEQUENCE | |
| latitude | Geographic coordinates that specifies the north–south position of a point on the Earth's surface according to the World Geodetic System 1984. | N465648.10 |
| longitude | Geographic coordinates that specifies the east-west position of a point on the 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 |
| extendedLocation | CHOICE | NOTE 1 |
| region | SEQUENCE | |
| cornerMarks | SEQUENCE OF | |
| Spot | CHOICE | |
| gsmLocation | CHOICE | |
| geoCoordinates | SEQUENCE | |
| latitude | Geographic coordinates that specifies the north–south position of a point on the | N465632.40 |

| | | |
|---|---|---|
| | 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. | E0072622.14 |
| mapDatum | World Geodetic System indication of the coordinates | wGS84 |
| azimuth | The azimuth is the bearing, relative to true north | 120 |
| Spot | CHOICE | |
| postalLocation | CHOICE | |
| AddressInformation | SEQUENCE | |
| buildingNumber | Building number | 42 |
| streetName | Street name | Hauptstrasse |
| postalCode | Postal code of the city | 9998 |
| city | City | Ueberdorf |
| country | Country code as defined in ISO 3166-1 (2013) | CH |
| NOTE 1: The use of the "extendedLocation" structure is dedicated to the delivery of the mobile 3GPP access location information to a cell composed of several antennas distributed in different geographical locations but sharing the same cell identity. | | |
| tAI | Tracking Area Identifier used for E-UTRAN according to 3GPP TS 23.003 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]_ |
| 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 | AB12CD34E0 |

| | (encoded with 36 bits, 5 octets with most significant semi-octet as spare = 0) | |
|---|---|---|
| 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.<br>This element shall be used only in the context of 5G NR or Multi-RAT connectivity. MCC(2 octets)+MNC(1 octet)+TAC(2 octets for E-UTRAN or 3 octets for NR) | 22F899AB56E3<br>22F89948CF |
| locationInformationSource | To provide specific information about the configuration characteristics of a complex cell. For instance with several azimuths and split sectors | 170,0,180,Normal, SplitSec,SplitSec |
| n3gppaLocation | | |
| n3gppTai | non-3GPP TAI used in the PLMN. MCC(2 octets)+MNC(1 octet)+TAC(3 octets) | 22F899AC7D76 |
| ..n3IwfId | N3IWF identifier received over NGAP MCC(2 octets)+MNC(1 octet)+N3IWF-ID(2 octets). | 22F899ABC2 |
| ueIpv4Addr | | |
| iPTextAddress | | 198.51.100.1 |
| ueIpv6Addr | | |
| iPTextAddress | | 2001:DB8:7401::bdd7 |
| portNumber | UDP or TCP source port number | 49345 |
| transmitterDetails | SEQUENCE | |
| frequency | Transmitter frequency in kHz | 1800000 |
| technology | Technology used for the network access | gen2G<br>gen3G<br>eUTRAN<br>wLAN<br>hSPAEvolution<br>gAN<br>vIRTUAL<br>eUTRANNBIoT<br>ITEM<br>nR |
| **Structure to provide the identifiers information and the radio access type for the different network access technologies** | | |
| ePSInformation | The identifiers are related to a mobile network access based on GERAN, UTRAN or E-UTRAN. | |

| | | |
|---|---|---|
| iMSI | The International Mobile Subscriber Identity (IMSI) of the target.<br>(IMSI is 15 digits long + last digit "F" as a filler half-octet) | 228993035511773F |
| mSISDN | MSISDN number of the mobile target. | |
| PartyNumber | | 41751112233 |
| iMEISV | The International Mobile station Equipment Identity (IMEI) of the target. | |
| IMEI | | 356843155396570F |
| rATType | This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station as defined in 3GPP TS 29.060 V13.7.0 clause 7.7.50, if available. | 1 (=UTRAN)<br>2 (=GERAN)<br>3 (=WLAN)<br>4 (=GAN)<br>5 (=HSPA Evolution)<br>6 (=E-UTRAN) |
| fiveGSInformation | The identifiers are related to a mobile network access based on NR 5G system | |
| sUPI | CHOICE | |
| iMSI | SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet) | 228993035511773F |
| nAI | SUPI in the form of a Network Access Identifier according to IETF RFC 4282. | joe@example.com |
| gPSI | CHOICE | |
| mSISDN | GPSI in the form of a MSISDN | |
| PartyNumber | Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription. | 41771112233 |
| nAI | GPSI in the form of a Network Access Identifier according to IETF RFC 4282. | joe@example.com |
| pEI | Served PEI of the ME as specified in 3GPP TS 23.003 V15.7.0 Clause 6.4, if available. | |
| IMEI | IMEI is encoded on 8 octets to allow the 14 digits (TAC+SNR). When no Check Digit is present the IMEI shall be coded with the first 14 digits + 0F at the end. See 3GPP TS 29.060 V15.5.0 clause 7.7.53. | 359040082042280F |
| IMEISV | IMEISV is encoded on 8 octets to allow the 14 digits (TAC+SNR) + 2 digits of | 3571600455770051 |

| | | |
|---|---|---|
| | Software Version (SV). See 3GPP TS 29.060 V15.5.0 clause 7.7.53. | |
| rANSecondaryRATType | Secondary Radio Access Type (RAT) usage as reported from the Radio Access Network (RAN) if available. See 3GPP TS 32.291 clause 6.1.6.2.2.17 | nr<br>eutra<br>wlan,<br>virtual<br>nBIoT<br>wireline<br>wirelineCable<br>wirelineDSL<br>wirelinePON<br>ITEM<br>nRU<br>eUTRAU<br>trustedN3GA<br>trustedWLAN<br>uTRA<br>gERA |
| wifiInformation | | |
| bssid | The Basic Service Set Identification (BSSID) is the MAC address of the access point. | 001B774954FD<br>*[in hexadecimal format]* |

**Table 7-9: Method 2 - parameters to be delivered via HI-B 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:<br>1) Geographical coordinates,<br>2) Postal location<br>The following location information elements and fields may be present in the request: | | |

| **1) Geographical coordinates elements** | |
|---|---|
| gsmLocation | Table B.11 |
| *Description and requirements* | *Examples* |
| The formats of the following elements (latitude, and longitude and azimuth) are defined in detail in ETSI TS 102 657 V1.26.1 Annex B.3.<br>The geographical coordinates of the antenna shall be indicated according to the WGS84 World Geodetic System.<br>Elements:<br>latitude    [XDDMMSS.SS]<br>longitude    [XDDDMMSS.SS]<br>mapDatum | <br><br><br><br><br><br>N465648.10<br>E0072650.80<br>wGS84 |
| **2) Postal location elements** | |
| buildingNumber | |
| *Description and requirements* | *Examples* |
| The building number. | 127<br>4a |
| streetName | |
| *Description and requirements* | *Examples* |
| The name of the street or place or road indication. | route de Versoix<br>Bärenplatz<br>Autobahn A5 km38<br>Langstrasse 15<br><br>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<br>Zürich<br>Lugano<br><br>Note: UTF-8 coding is preferred. |
| country | |
| *Description and requirements* | *Examples* |
| Country code as defined in ISO 3166-1 (2013) | CH<br>FL |
| otherInformation | |
| *Description and requirements* | *Examples* |
| Additional information of the venue | Indoor EG<br>Terminal B<br>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.<br>MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets) | 22F8901D50BB59<br>*[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.<br>First octet represents the flags as specified in 3GPP TS 29.274 clause 8.21.<br>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<br>*[in hexadecimal format]* |
| eCGI | Table B.11 |
| *Description and requirements* | *Example* |
| E-UTRAN Cell Global Identity (ECGI)<br>First octet "07" represents the length in octets.<br>MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0) | 0722F890056C8720<br>*[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.<br>This element shall be used only in the context of 5G NR and Multi-RAT connectivity.<br>MCC(2 octets)+MNC(1 octet)+TAC(2 octets for E-UTRAN or 3 octets for NR) | 22F899AB56E3<br>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<br>[MCC(2 octets)+MNC(1 octet)] | 22F899 |
| nRcellID<br>[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<br>*[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<br>4a |
| streetName | |
| *Description and requirements* | *Examples* |
| The name of the street or place or road indication. | route de Versoix<br>Bärenplatz<br>Autobahn A5 km38<br>Langstrasse 15<br><br>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<br>Lugano<br><br>Note: UTF-8 coding is preferred. |
| country | |
| *Description and requirements* | *Examples* |
| Country code as defined in ISO 3166-1 (2013) | CH<br>FL |
| otherInformation | |
| *Description and requirements* | *Examples* |
| Additional information of the venue | Indoor EG<br>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<br>called |
| partyIdentity | SIP URI or TEL URI or E.164 number in international format. | sip:alice@atlanta.com<br>tel:+41598889988<br>41598889988 |
| **Time interval constraints for the request** | | |
| lessThanOrEqualTo | Request constraint | |
| multimediaRecord | Service = multimedia | |

| Element or attribute | Description | Example |
|---|---|---|
| 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). | 20190428110000Z |
| greaterThanOrEqualTo | Request constraint | |
| multimediaRecord | Service = multimedia | |
| multimediaServiceUsage | Category = multimedia service usage | |
| partyInformation | XSD structure | |
| MultimediaPartyInformation | XSD structure | |
| communicationTime | | |
| startTime | The calendar date and time of the beginning of the communication with at least a precision to the second. It shall be in local time with indication of the time zone relative to UTC or in UTC time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (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 time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (11/08). | 20181028090000Z |
| greaterThanOrEqualTo | Request constraint | |
| networkAccess | Service = network access | |
| naServiceUsage | Category = network access service usage | |
| interval | XSD structure | |
| startTime | The calendar date and time of the beginning of the communication with at least a precision to the second. It shall be in local time with indication of the time zone relative to UTC or in UTC time. The format is according to the GeneralizedTime parameter specified in ITU-T X.680 (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<br>called |
| partyIdentity | SIP URI or TEL URI or E.164 number in international format. | sip:alice@atlanta.com<br>tel:+41598889988<br>41598889988 |
| natureOfAddress | Optionally the nature of address element may complement the "partyIdentity" element in order to avoid any ambiguity. | International<br>National<br>Unknown |
| accessNetworkInformation | Structure with a sequence of accessNetworkInfo, composed of the PaniHeaderInfo structure. | |
| AccessNetworkInfo | SEQUENCE OF | |
| paniHeaderInfo | | |
| paniLocation | | |
| globalCellID | Cell Global Identity (CGI) serving the party of the reference call. The CGI may be used for GERAN and UTRAN mobile PS network access.<br>MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets) | 22F8901D50BB59<br>*[in hexadecimal format]* |
| eCGI | E-UTRAN Cell Global Identity (ECGI) serving the party of the reference call in E-UTRAN mode (VoLTE).<br>Firs octet "07" represents the length in octets.<br>MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0) | 0722F890056C8720<br>*[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 | SEQUENCE | |
| 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 |
| naAccessTime | GeneralizedTime | 20191109134308.129Z |
| **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 <br> 4a |
| streetName | The name of the street or place or road indication. | route de Versoix <br> Bärenplatz <br> Autobahn A5 km38 <br> Langstrasse 15 <br><br> 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 <br> Zürich <br> Lugano <br><br> Note: UTF-8 coding is preferred. |
| country | Country code as defined in ISO 3166-1 (2013) | CH <br> FL |
| otherInformation | Additional information of the venue | Indoor EG <br> 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.<br>MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets) | 22F8901D50BB59<br>*[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.<br>First octet "05" represents the length in octets.<br>MCC(2 octets)+MNC(1 octet)+TAC(2 octets) | 0522F89035B7<br>*[in hexadecimal format]* |
| eCGI | E-UTRAN Cell Global Identity (ECGI) serving the party in E-UTRAN mode (VoLTE).<br>Firs octet "07" represents the length in octets.<br>MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0) | 0722F890056C8720<br>*[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.<br>This element shall be used only in the context of 5G NR and Multi-RAT connectivity.<br>MCC(2 octets)+MNC(1 octet)+TAC(2 octets for E-UTRAN or 3 octets for NR) | 22F899AB56E3<br>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<br><br>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<br><br>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<br><br>and<br><br>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 | 9AF3BB829824 |

| | | |
|---|---|---|
| | connection. This is also the MAC address of the access point. | |
| 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<br>4a |
| streetName | The name of the street or place or road indication. | route de Versoix<br>Bärenplatz<br>Autobahn A5 km38<br>Langstrasse 15<br><br>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<br>Zürich<br>Lugano<br><br>Note: UTF-8 coding is preferred. |
| country | Country code as defined in ISO 3166-1 (2013) | CH<br>FL |
| otherInformation | Additional information of the venue | Indoor EG<br>Terminal B |

| Time period interval for the request (Mobile or WLAN network access) | | |
|---|---|---|
| **Element or attribute** | **Description** | **Example** |
| lessThanOrEqualTo<br><br>and<br><br>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<br>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 PTSS determines based on consultations with CSP the ~~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 V1.26.1 | 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 V1.26.1 | 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 V1.26.1 | Selection of ETSI options for Switzerland | Additional requirements or specifications |
|---|---|---|
| 5.2.2 | **Cancellation of request**<br>"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**<br>In case of Multi-part delivery the option "sequential delivery" shall be used. | |
| 5.3 | **Message flows for Authorised-Organisation-initiated scenario**<br>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.<br>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**<br>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**<br>The Authorised Organisation code is managed and delivered exclusively by PTSS. | |
| 6.1.3.1 | **CSP Identifiers**<br>CSPID codepoints are managed and delivered exclusively by PTSS. | |
| 6.1.3.2 | **Third Party CSP Identifiers**<br>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 V1.26.1 | Selection of ETSI options for Switzerland | Additional requirements or specifications |
|---|---|---|
| 6.1.5 | **RequestType**<br>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**<br>Retained data responses are from the same service and the same category. | |
| 6.2.3 | **Volatile information**<br>Option 2 is preferred. The CSP shall inform PTSS which option it implements. | |
| 6.3.1 | **Retained Data requests; Information contained within a request**<br>The XPATH notation method is not used in Switzerland. | |
| 6.3.3.1 | **Priority of a request**<br>Priority indication shall be used. | The priority parameter "requestPriority" is specified with two priorities:<br>00 = Urgent / Dringend / Urgent<br>01 = Normal<br>If the parameter "requestPriority" is not present the request shall be treated as regular "01". |
| 6.3.3.2 | **Maximum hits**<br>Maximum hits is not used. | |
| 6.3.3.3 | **Maximum records per batch**<br>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**<br>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**<br>CategorisedErrorDescription list and values see section 7.5.1 | |

| Clause ETSI TS 102 657 V1.26.1 | Selection of ETSI options for Switzerland | Additional requirements or specifications |
|---|---|---|
| 7.2.1 | **Basic configuration**<br>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**<br>This arrangement does not apply to Switzerland<br>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**<br>This arrangement shall be supported.<br>NOTE: This is caused by the fact that the Message flows for general situation (according to clause 5.2) are used in Switzerland. | The ~~PTSS determines based on consultations with each CSP the~~ definition of ~~the~~ URI. ~~is subject to confidential agreements between PTSS and each CSP.~~<br>On PTSS side the client uses the following timeout and retries configuration:<br>Connection timeout: 10 seconds<br>Read timeout: 30 seconds<br>Retry policy: every 1 minute, 15 retries<br>Final failure: Alert/requeue for manual processing. |
| 7.2.4 | **Details common to both single and mutual cases**<br>The POST method shall be used.<br>The content-type text/xml shall be used. | |
| 7.3 | **Direct TCP data exchange**<br>Direct TCP is not used in Switzerland. | |
| 8 | **Security measures**<br>Section 9 describes the connection level security. | |
| 8.2 | **Connection Level Security**<br>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 V1.26.1 | Selection of ETSI options for Switzerland | Additional requirements or specifications |
|---|---|---|
| Annexes | **XML Schema definition** The version of the supported XML schema, definition must be explicitly announced by PTSS. | See section 7.6 and 8.6 The following changes are applicable in Switzerland to the ETSI published xsd: The elements "MsgSubscriberID", "MsgStoreID", "MultimediaBillingIdentifier", "MultimediaDeviceID" are defined with a type "string" instead of "hexBinary", as <xsd:simpleType name="**MsgSubscriberID**">     <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> <xsd:simpleType name="**MsgStoreID**">     <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> <xsd:simpleType name="**MultimediaBillingIdentifier**">     <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> <xsd:simpleType name="**MultimediaDeviceID**">     <xsd:restriction base="**xsd:string**"/> </xsd:simpleType> |
| Annex I [Informative] | **Manual techniques** Manual techniques should be used when no electronic interface is available (e.g. in case of failure). The PTSS determines based on consultations with CSP the use of the manual technique. 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 7-107-9: ETSI TS 102 657 V1.26.1 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 V1.26.1 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 7-117 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 V1.26.1** | |
| RDMessage XML Schema (xsd) | RDMessage,ver24.xsd<br>xmlns="http://uri.etsi.org/02657/v1.26.1#/RetainedData"<br><br>The following changes are applicable in Switzerland to the ETSI published xsd:<br>The elements "MsgSubscriberID", "MsgStoreID", "MultimediaBillingIdentifier", "MultimediaDeviceID" are defined with a type "string" instead of "hexBinary", as<br><br>`<xsd:simpleType name="`**MsgSubscriberID**`">`<br>`        <xsd:restriction base="`**xsd:string**`"/>`<br>`</xsd:simpleType>`<br><br>`<xsd:simpleType name="`**MsgStoreID**`">`<br>`        <xsd:restriction base="`**xsd:string**`"/>`<br>`</xsd:simpleType>`<br><br>`<xsd:simpleType name="`**MultimediaBillingIdentifier**`">`<br>`        <xsd:restriction base="`**xsd:string**`"/>`<br>`</xsd:simpleType>`<br><br>`<xsd:simpleType name="`**MultimediaDeviceID**`">`<br>`        <xsd:restriction base="`**xsd:string**`"/>`<br>`</xsd:simpleType>` |

**Table 7-127 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 V1.26.1.

## 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 V1.26.1 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 V1.26.1 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 V1.26.1 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 V1.26.1 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 V1.26.1 Annexes A and E | 8.4.1.9 8.4.1.10 |

**Table 8-18-1: 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 V1.26.1 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 V1.26.1 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 V1.26.1 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 V1.26.1 Annexes A and E | 8.4.4.1 8.4.4.2 |

| | Communication service subscription information | | |
|---|---|---|---|

**Table 8-28-2: 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 V1.26.1 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 V1.26.1 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 V1.26.1 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 V1.26.1 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 V1.26.1 Annexes A and E | 8.4.9.1 8.4.9.2 |

**Table 8-38-3: 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 V1.26.1 clauses 6.1 and 6.2

| Element or attribute | Description | Example |
|---|---|---|
| rdHeaderId | Object Identifier | 0.4.0.2.3.0.24 |
| **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<br>IR_5_NA_FLEX<br>IR_10_TEL<br>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:<br>equals<br>lessThanOrEqualTo<br>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 information data must be sent to. In case of electronic delivery it will be an URI | URI: https://ptss-host[nn].lidn.ejpd.admin.ch/P/HIB/IRC/<br><br>(*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 8-48-4: 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 V1.26.1 clauses 6.1 and 6.2.

| Element or attribute | Description | Example |
|---|---|---|
| rdHeaderId | Object Identifier | 0.4.0.2.3.0.24 |
| | | |
| 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<br>20140319141625+0100 |
| requestType | Request type provided by PTSS | IR_4_NA<br>IR_5_NA_FLEX<br>IR_10_TEL<br>IR_11_TEL_FLEX |
| | | |

| responseMessage | | |
|---|---|---|
| responseStatus | Response status from CSP can be:<br>- responseComplete: if all records related to the request are included.<br>- 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.<br>- 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 8-58-5: 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 V1.26.1 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 |
| eID | Identifier of the eUICC according to GSMA SGP.02 V4.0. (32 num.digits long) | 32106549871234567890741085296321 |
| 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<br>Von der Heide Peter Hans<br>De Pourtalès Léon<br>Liu Jianguo<br>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<br>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 V1.26.1 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~~Indicates if it's a primary or secondary device in case of Multi-Device subscription. One record per device shall be delivered. | ~~International data pack~~Primary Secondary |
| installationAddress | Structure composed of the installation address of the subscriber's equipment, if applicable. | |
| buildingNumber | Building number | 12 |
| streetName | Street name | Mittelstrasse |
| postalCode | Postal code of the city | 9999 |
| city | City | Ortdorf |
| country | Country code as defined in ISO 3166-1 (2013) | CH |
| validity | structure | |
| startTime | Start time of the installation | 20100611000000+0200 20100611000000Z |
| endTime | End time of the installation, if applicable. | 20150630000000+0200 20150630000000Z |
| fixIpAddress | Fix IP address assigned to the subscriber in text format, if applicable. | 203.0.113.25 2001:DB8:7401::EDF:BDD7 |
| naServiceStatus | Information about the status of the subscribed service. | active ceased suspended |

| | | |
|---|---|---|
| additionalIPAddresses | IP addresses assigned to the subscriber. When the IP addresses or ranges or prefix assigned to the subscriber have different time of validity, the structure timedIPAddresses shall be used. | |
| IPAddressSetOrRangeOrMask | CHOICE | set, range, |
| set | Sequence of IP addresses | |
| iPTextAddress | | 203.0.113.25 2001:DB8:7401::EDF:BDD7 |
| range | | |
| prefix | IP address in text format | 203.0.113.0 2001:DB8:: |
| subnetlength | IP subnet length integer | 24 32 |
| subscriptionType | Structure | |
| SubscriptionType | ENUMERATED | unknown postpay prepay other |
| resellerAddress | Structure | |
| AddressInformation | SEQUENCE | |
| buildingNumber | Building number | 28 |
| streetName | Street name | Beispielstrasse |
| postalCode | Postal code of the city | 9989 |
| city | City | Beispielstadt |
| country | Country code as defined in ISO 3166-1 (2013) | CH |
| relatedOrganizationInfo | Structure | |
| OrganizationInfo | SEQUENCE | |
| name | Name of the reseller organisation | CheapMobile SA |
| createTime | Time that subscriber account was created by the reseller organisation. | 20160525134000+0200 20160525134000Z |
| relatedPersonName | PersonName | |
| PersonName | SEQUENCE | |
| surname | The reseller surname(s) and firstname(s), as well as the prefixes and suffixes if applicable, are provided in this field only. | Muster Joe |
| allocatedDevices | SEQUENCE OF | |
| 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 | NA7654321 |

| | | |
|---|---|---|
| | when it differs from the subscriberID defined in the NASubscriber sequence. | |
| 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 |
| eID | Identifier of the eUICC according to GSMA SGP.02 V4.0. (32 num.digits long) | 32106549871234567890741085296321 |
| timedIPAddresses | SEQUENCE OF | |
| 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 |

| validity | | |
|---|---|---|
|   startTime | Start time of the subscribed IP address or range or prefix | 20100611000000+0200 20100611000000Z |
|   endTime | End time of the subscribed IP address or range or prefix | 20160731000000+0200 20160731000000Z |
| | | |
| **subscriber structure** | | |
| GenericSubscriberInfo | SEQUENCE | |
| **OrganizationInfo** | SEQUENCE | |
| name | Name of the organisation (corporate, foundation, etc...) | FOOBAR AG |
| contactDetails | SEQUENCE | |
| address | structure | |
| AddressInformation | SEQUENCE | |
|   buildingNumber | Building number | 12 |
|   streetName | Street name | Mittelstrasse |
|   poBox | Postal Box number | 5578 |
|   postalCode | Postal code of the city | 9999 |
|   city | City | Ortdorf |
|   country | Country code as defined in ISO 3166-1 (2013) | CH |
| 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<br>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 V1.26.1 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 |
| options | Indicates if it's a primary or secondary device in case of Multi-Device subscription. One record per device shall be delivered. | Primary Secondary |
| allocatedDevices | SEQUENCE OF NADevice | |
| 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 |
| eID | Identifier of the eUICC according to GSMA SGP.02 V4.0. (32 num.digits long) | 32106549871234567890741085296321 |

### 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<br>2001:DB8:7401::bdd7 |
| | | |
| lessThanOrEqualTo | Request constraint | |
| networkAccess | Service = networkAccess | |
| naServiceUsage | Category = naServiceUsage | |
| interval | | |
| ~~t~~Timespan | | |
| startTime | GeneralizedTime | 20200604103324~~Z~~+0200 |
| | | |
| greaterThanOrEqualTo | Request constraint | |
| networkAccess | Service = networkAccess | |
| naServiceUsage | Category = naServiceUsage | |
| interval | | |
| ~~t~~Timespan | | |
| startTime | GeneralizedTime | 20200604103324~~Z~~+0200 |

### 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 V1.26.1 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.<br>(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<br>cable modem |

| | | |
|---|---|---|
| macAddress | Media Access Control address according to IEEE 802. (6 octets) | 54A6FA471B3C |
| dslID | DSL identifier as set by the CSP. | DSL-134523 |
| subscriberID | An alternative identifier for the subscriber using a specific service of the CSP. To be used only when it differs from the subscriberID defined in the NASubscriber sequence. | NA7654321 |
| fiveGSInformation | SEQUENCE | |
| sUPI | CHOICE | |
| iMSI | SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet) | 228993035511773F |
| nAI | SUPI in the form of a Network Access Identifier according to IETF RFC 4282. | joe@example.com |
| gPSI | CHOICE | |
| mSISDN | GPSI in the form of a MSISDN | |
| PartyNumber | Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription. | 41771112233 |
| nAI | GPSI in the form of a Network Access Identifier according to IETF RFC 4282. | joe@example.com |

### 8.4.1.7 IR_8_IP (NAT) request criteria elements and structure for identification of a user by its shared assigned IP address

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

| Network access service | | |
|---|---|---|
| **Element or attribute** | **Description** | **Example** |
| equals | Request constraint | |
| networkAccess | Service = networkAccess | |
| naServiceUsage | Category = naServiceUsage | |
| | | |
| **addressTranslationRecords structure** | | |
| addressTranslationRecord | SEQUENCE | |
| publicIPAddress | Structure | |
| IPAddress | CHOICE | |
| iPTextAddress | The translated IP address of the host, i.e. the address known by the remote host in text format. | 203.0.113.45 |
| publicPort | CHOICE | |
| singlePort | The translated port of the host. | 32658 |
| portRange | SEQUENCE OF | |

| PortRange | SEQUENCE | |
|---|---|---|
| lowerBound | Lower bound port number of the range | 30000 |
| upperbound | Upper bound port number of the range | 30999 |
| destinationIPAddress | The IP address of the remote host. | |
| IPAddress | CHOICE | |
| iPTextAddress | The IP address of the destination host. | 198.51.100.24 |
| destinationPort | The port of the remote host | 44214 |
| connectionType | ENUMERATED<br>The protocol used for the session. | udp<br>tcp<br>sctp<br>other |
| | | |
| lessThanOrEqualTo | Request constraint | |
| networkAccess | Service = networkAccess | |
| naServiceUsage | Category = naServiceUsage | |
| interval | | |
| tTimespan | | |
| startTime | GeneralizedTime | 20200604103324Z+0630 |
| | | |
| greaterThanOrEqualTo | Request constraint | |
| networkAccess | Service = networkAccess | |
| naServiceUsage | Category = naServiceUsage | |
| interval | | |
| tTimespan | | |
| startTime | GeneralizedTime | 20200604103324Z+0630 |

### 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 V1.26.1 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. | 228993035511773F |

| | (IMSI is 15 digits long + last digit "F" as a filler half-octet) | |
|---|---|---|
| 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. (IMSI is 15 digits long + last digit "F" as a filler half-octet) | 228993035511773F |
| nAI | SUPI in the form of a Network Access Identifier according to IETF RFC 4282. | joe@example.com |
| gPSI | CHOICE | |
| mSISDN | GPSI in the form of a MSISDN | |
| PartyNumber | Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription. | 41771112233 |
| nAI | GPSI in the form of a Network Access Identifier according to IETF RFC 4282. | joe@example.com |

### 8.4.1.9 IR_9_NAT request criteria elements and structure for network access translation information

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

| Network access service | | |
|---|---|---|
| **Element or attribute** | **Description** | **Example** |
| equals | Request constraint | |
| networkAccess | Service = networkAccess | |
| naServiceUsage | Category = naServiceUsage | |
| | | |

| addressTranslationRecords structure | | |
|---|---|---|
| addressTranslationRecord | SEQUENCE | |
| privateIPAddress | Source IP address before the NAT instance | |
|   IPAddress | CHOICE | |
|    iPTextAddress | The private IP address of the host. | 192.168.0.24 |
| privatePort | Source port before the NAT instance | 25871 |
| publicIPAddress | Source IP address after the NAT instance | |
|   IPAddress | CHOICE | |
|    iPTextAddress | The translated IP address of the host, i.e. the address known by the remote host in text format. | 203.0.113.45 |
| publicPort | CHOICE Source port after the NAT instance on the public side. It can be either a single port (using singlePort) or a port range (using portRange). | |
|   singlePort | The translated port of the host. | 32658 |
|   portRange | SEQUENCE OF | |
|    PortRange | SEQUENCE | |
|     lowerBound | Lower bound port number of the range | 30000 |
|     upperbound | Upper bound port number of the range | 30999 |
| destinationIPAddress | The IP address of the remote host. | |
|   IPAddress | CHOICE | |
|    iPTextAddress | The IP address of the destination host. | 198.51.100.24 |
| destinationPort | The port of the remote host | 44214 |
| connectionType | ENUMERATED The protocol used for the session. | udp tcp sctp other |
|  |  |  |
| lessThanOrEqualTo | Request constraint | |
|  networkAccess | Service = networkAccess | |
|   naServiceUsage | Category = naServiceUsage | |
|    interval | | |
|     tTimespan | | |
|      startTime | GeneralizedTime | 20200604103324Z+0100 |
|  |  |  |
| greaterThanOrEqualTo | Request constraint | |
|  networkAccess | Service = networkAccess | |
|   naServiceUsage | Category = naServiceUsage | |
|    interval | | |
|     tTimespan | | |
|      startTime | GeneralizedTime | 20200604103324Z+0100 |

### 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 V1.26.1 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<br>Source port after the NAT instance on the public side. It can be either a single port (using singlePort) or a port range (using portRange) | |
| singlePort | The translated port of the host. | 32658 |
| portRange | SEQUENCE OF | |
| PortRange | SEQUENCE | |
| lowerBound | Lower bound port number of the range | 30000 |
| upperbound | Upper bound port number of the range | 30999 |

Depending on the Network Address Translation instance configuration and capabilities, either the "privateIPAddress" and "privatePort" before the NAT instance or the "publicIPAddress" and "publicPort" after the NAT instance shall be reported.

## 8.4.2  Multimedia and telephony information requests and responses

The encoding and formats of the parameters for the network access information requests and responses relate to ETSI TS 102 657 V1.26.1 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 |
| eID | Identifier of the eUICC according to GSMA SGP.02 V4.0. (32 num.digits long) | 3210654987123456789074 1085296321 |

### 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 V1.26.1 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)<br>female (1) |
| AuthenticationInfo | SEQUENCE | |
| authenticationType | Description of the type of document used to authenticate, e.g. passport, ID card | ID card<br>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<br>Mobile Unlimited |
| timeSpan | Structure | |
| startTime | Start time of the service | 20100225120000+0200<br>20100225120000Z |
| endTime | End time of the service, if applicable. | 20160731120000+0200<br>20160731120000Z |
| registeredIdentifiers | SEQUENCE OF | |
| PartyIdentity | Party identity or identities of the multimedia or telephony subscriber. | 41771112233<br>sip:+41771112233@csp.ch<br>tel:+41771112233<br>sip:+ 41992305887@csp.ch<br>tel:+41992305887 |
| serviceType | The type of service subscribed to. | |

| | | |
|---|---|---|
| MultimediaServiceType | ENUMERATED | private,<br>privatePABX,<br>publicPayphone,<br>geographicalfixed,<br>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<br>20100611000000Z |
| endTime | End time of the installation, if applicable. | 20160731120000+0200<br>20160731120000Z |
| carrierPreselect | Indicates if a carrier preselection is active (true) or not (false). | false<br>true |
| lineStatus | CSP-specific description of current line status.<br>e.g. "Active", "Ceased", etc. | Active<br>Ceased<br>Suspended |
| subscriptionType | Describes the nature of the subscription | |
| SubscriptionType | ENUMERATED | unknown,<br>postpay,<br>prepay,<br>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 | Muster Joe |

| | | |
|---|---|---|
| | applicable, are provided in this field only. | |
| multimediaServiceType | Indicates if it's a primary or secondary device in case of Multi-Device subscription. One record per device shall be delivered. | Primary Secondary |
| registeredICCIDs | SEQUENCE OF | |
| ICCIDInfo | | |
| iCCID | Integrated Circuit Card ID of the subscriber (SIM) | 89410228641400127777 |
| iMSI | The International Mobile Subscriber Identity (IMSI) of the subscriber. (IMSI is 15 digits long + last digit "F" as a filler half-octet) | 228993035511773F |
| sUPI | CHOICE | |
| iMSI | SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet) | 228993035511773F |
| nAI | SUPI in the form of a Network Access Identifier according to IETF RFC 4282. | joe@example.com |
| gPSI | CHOICE | |
| mSISDN | GPSI in the form of a MSISDN | |
| PartyNumber | Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription. | 41771112233 |
| nAI | GPSI in the form of a Network Access Identifier according to IETF RFC 4282. | joe@example.com |
| eID | Identifier of the eUICC according to GSMA SGP.02 V4.0. (32 num.digits long) | 32106549871234567890741085296321 |

### 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.mcc228.3gppnet work.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 V1.26.1 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 | |
| tTimeSpan | 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 |
| multimediaServiceType | Indicates if it's a primary or secondary device in case of Multi-Device subscription. One record per device shall be delivered. | Primary Secondary |
| registeredICCIDs | SEQUENCE OF | |
| ICCIDInfo | | |
| iCCID | Integrated Circuit Card ID of the subscriber (SIM) | 89410228641400127777 |
| pUK | PIN Unlock Key code linked to the subscriber's SIM card. | 49682767 |

| pUK2 | PIN Unlock Key 2 code linked to the subscriber's SIM card. | 87654321 |
|---|---|---|
| iMSI | The International Mobile Subscriber Identity (IMSI) of the subscriber. (IMSI is 15 digits long + last digit "F" as a filler half-octet) | 228993035511773F |
| sUPI | CHOICE | |
| iMSI | SUPI in the form of an IMSI. (IMSI is 15 digits long + last digit "F" as a filler half-octet) | 228993035511773F |
| nAI | SUPI in the form of a Network Access Identifier according to IETF RFC 4282. | joe@example.com |
| gPSI | CHOICE | |
| mSISDN | GPSI in the form of a MSISDN | |
| PartyNumber | Mobile Station International ISDN Numbers (MSISDNs) allocated to this 5G subscription. | 41771112233 |
| nAI | GPSI in the form of a Network Access Identifier according to IETF RFC 4282. | joe@example.com |
| eID | Identifier of the eUICC according to GSMA SGP.02 V4.0. (32 num.digits long) | 32106549871234567890741085296321 |
| 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 V1.26.1 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.

| M~~essage~~ultimedia 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 V1.26.1 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<br>Von der Heide Peter Hans<br>De Pourtalès Léon<br>Liu Jianguo<br>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<br>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 V1.26.1 Annexes A and C.

| ~~Message~~~~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 V1.26.1 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 V1.26.1 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<br>Von der Heide Peter Hans<br>De Pourtalès Léon<br>Liu Jianguo<br>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 V1.26.1 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<br>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 V1.26.1 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 V1.26.1 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<br>sip:+41771112233@csp.ch<br>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 V1.26.1 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 |
| eID | Identifier of the eUICC according to GSMA SGP.02 V4.0. (32 num.digits long) | 3210654987123456789074 1085296321 |
| allocatedDeviceIDs | SEQUENCE OF | |
| MultimediaDeviceID | A unique identifier for the multimedia device. NOTE: Unlike in ETSI TS 102 657 V1.26.1 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 V1.26.1 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~~

### 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 V1.26.1 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 V1.26.1 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

**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 |
| eID | Identifier of the eUICC according to GSMA SGP.02 V4.0. (32 num.digits long) | 3210654987123456789074 1085296321 |
| allocatedDeviceIDs | SEQUENCE OF | |

| MultimediaDeviceID | A unique identifier for the multimedia device.<br>NOTE: Unlike in ETSI TS 102 657 V1.26.1 this element is specified as a "string". | SOM876352 |
|---|---|---|

### 8.4.8.4 IR_20_CONTRACT response elements and structure for contract document copy

This section covers the information response elements and fields of the electronic format contract document copy information. There are two methods to deliver this information.

Method 1: The electronic format contract document copy can be uploaded via the Graphical User Interface (GUI) of the Information Request Component (IRC) application provided by the PTSS.

Method 2: The electronic format contract document copy information can be delivered via the HI-B interface for all services according to ETSI TS 102 657 V1.26.1 Annexes A and D. Prior to its implementation, this method 2 must be determined by the PTSS based on consultations with the CSP.

| Multimedia Subscriber | | |
|---|---|---|
| **Element or attribute** | **Description** | **Example** |
| recordNumber | Structure | 0, 1, 2, ... |
| recordPayload structure | | |
| multimediaRecord | Service = multimedia | |
| multimediaSubscriber | Category = multimediaSubscriber | |
| | | |
| **genericSubscriberInfo** | Structure | |
| contracts | Structure | |
| contractInformation | SEQUENCE OF | |
| contractDocuments | SEQUENCE OF | |
| File | Structure | |
| mediaType | Media type of the file according to IANA assignments. | image/jpeg<br>image/png<br>application/pdf |
| content | Content of file in OCTET STRING | |

### 8.4.9 Technical information requests and responses

The encoding and formats of the parameters for the technical data information requests and responses relate to ETSI TS 102 657 V1.26.1 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. First octet "07" represents the length in octets. MCC(2 octets)+MNC(1 octet)+ECI(encoded with 28 bits, 4 octets with first semi-octet as spare = 0) | 0722F890056C8720 *[in hexadecimal format]* |
| bSSID | The Basic Service Set Identification (BSSID) of the WLAN access point. Equivalent to the MAC address of the access point. | 5A23A4CF572F |
| nCGI | The NR Cell Global Identity (NCGI) is composed of the PLMN Identifier (pLMNID) and the NR Cell Identity (nRcellID) as shown in 3GPP TS 23.003 V15.7.0 cl. 19.6A | |

| pLMNID | Public Land Mobile Network Identifier<br>MCC(2 octets)+MNC(1 octet) | 22F899 |
|---|---|---|
| nRcellID | NR Cell Identity<br>(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 V1.26.1 Annexes A and E.

| Network access | | |
|---|---|---|
| **Element or attribute** | **Description** | **Example** |
| recordNumber | Structure | 0, 1, 2, ... |
| recordPayload structure | | |
| networkAccess | Service = networkAccess | |
| naNetworkElement | Category = NANwElement | |
| | | |
| **NANwElement Structure** | | |
| validity | Time period during which the information given in the record is or was valid. | |
| tTimeSpan | | |
| startTime | GeneralizedTime | 20190321060000+0100 |
| endTime | GeneralizedTime | 20200612183000+0200 |
| location | SEQUENCE | |
| globalCellID | Cell Global Identity used for GERAN and UTRAN according to 3GPP TS 23.003 V13.8.0.<br>MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+CI(2 octets) | 22F8901D50BB59<br>*[in hexadecimal format]* |
| rAI | Routing Area Identifier according to 3GPP TS 23.003 V13.8.0<br>MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+RAC (1 octet) | 22F890FEDC43<br>*[in hexadecimal format]* |
| gsmLocation | CHOICE | |
| geoCoordinates | SEQUENCE | |
| latitude | Geographic coordinates that specifies the north–south position of a point on the Earth's surface according to the World Geodetic System 1984. | N465648.10 |
| longitude | Geographic coordinates that specifies the east-west position of a point on the Earth's surface according to the World Geodetic System 1984. | E0072650.80 |
| mapDatum | World Geodetic System indication of the coordinates | wGS84 |
| azimuth | The azimuth is the bearing, relative to true north | 270 |

| | | |
|---|---|---|
| sAI | Serving Area Identifier according to 3GPP TS 23.003 V13.8.0<br>MCC(2 octets)+MNC(1 octet)+LAC(2 octets)+SAC(2 octets) | 22F89065425785<br>*[in hexadecimal format]* |
| postalLocation | Structure | |
| AddressInformation | SEQUENCE | |
| buildingNumber | Building number | 28 |
| streetName | Street name | Marktplatz |
| postalCode | Postal code of the city | 9999 |
| city | City | Ortdorf |
| country | Country code as defined in ISO 3166-1 (2013) | CH |
| otherInformation | Site specific characteristics | Indoor |
| extendedLocation | CHOICE | NOTE 1 |
| region | SEQUENCE | |
| cornerMarks | SEQUENCE OF | |
| Spot | CHOICE | |
| gsmLocation | CHOICE | |
| geoCoordinates | SEQUENCE | |
| latitude | Geographic coordinates that specifies the north–south position of a point on the Earth's surface according to the World Geodetic System 1984. | N465632.40 |
| longitude | Geographic coordinates that specifies the east-west position of a point on the Earth's surface according to the World Geodetic System 1984. | E0072622.14 |
| mapDatum | World Geodetic System indication of the coordinates | wGS84 |
| azimuth | The azimuth is the bearing, relative to true north | 120 |
| Spot | CHOICE | |
| postalLocation | CHOICE | |
| AddressInformation | SEQUENCE | |
| buildingNumber | Building number | 42 |
| streetName | Street name | Hauptstrasse |
| postalCode | Postal code of the city | 9998 |
| city | City | Ueberdorf |
| country | Country code as defined in ISO 3166-1 (2013) | CH |
| NOTE 1: The use of the "extendedLocation" structure is dedicated to the delivery of the mobile 3GPP access location information to a cell composed of several antennas distributed in different geographical locations but sharing the same cell identity. | | |
| tAI | Tracking Area Identifier used for E-UTRAN according to 3GPP TS 23.003 V13.8.0.<br>First octet "05" represents the length in octets.<br>MCC(2 octets)+MNC(1 octet)+TAC(2 octets) | 0522F89035B7<br>*[in hexadecimal format]* |
| eCGI | E-UTRAN Cell Global Identifier used for E-UTRAN according to 3GPP TS 23.003 V13.8.0. | 0722F890056C8720<br>*[in hexadecimal format]* |

| | | |
|---|---|---|
| | Firs octet "07" represents the length in octets.<br>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<br>(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 V1.26.1 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 V1.26.1 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.1.26.1** | |
| RDMessage XML Schema (xsd) | RDMessage,ver24.xsd<br>xmlns="http://uri.etsi.org/02657/v1.26.1#/RetainedData"<br><br>The following changes are applicable in Switzerland to the ETSI published xsd:<br>The elements "MsgSubscriberID", "MsgStoreID", "MultimediaBillingIdentifier", "MultimediaDeviceID" are defined with a type "string" instead of "hexBinary", as<br><br>&lt;xsd:simpleType name="**MsgSubscriberID**"&gt;<br>    &lt;xsd:restriction base="**xsd:string**"/&gt;<br>&lt;/xsd:simpleType&gt;<br><br>&lt;xsd:simpleType name="**MsgStoreID**"&gt;<br>    &lt;xsd:restriction base="**xsd:string**"/&gt;<br>&lt;/xsd:simpleType&gt;<br><br>&lt;xsd:simpleType name="**MultimediaBillingIdentifier**"&gt;<br>    &lt;xsd:restriction base="**xsd:string**"/&gt;<br>&lt;/xsd:simpleType&gt;<br><br>&lt;xsd:simpleType name="**MultimediaDeviceID**"&gt;<br>    &lt;xsd:restriction base="**xsd:string**"/&gt;<br>&lt;/xsd:simpleType&gt; |

**Table 8-68 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, Broadband Forum report and GSM Association documents used in this annex. It is meant to ease the reading and implementation of the handover interfaces specified in the present document.

| | |
|---|---|
| ETSI TS 101 331 V1.8.1 | Lawful Interception (LI); Requirements of Law Enforcement Agencies |
| ETSI TS 101 671 V3.12.1 | Telecommunication security; Lawful interception (LI); Handover interface for the lawful interception of telecommunication traffic |
| ETSI TS 102 232-1 V3.2419.1 | 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 V3.1341.1 | 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 V3.97.1 | 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 V3.1441.1 | 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 V3.1066.1 | 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 V1.142.1 | Lawful Interception (LI); ASN.1 Object Identifiers in Lawful Interception and Retained data handling Specifications |
| ETSI TS 102 657 V1.2886.1 | Lawful Interception (LI); Retained data handling; Handover interface for the request and delivery of retained data |
| ETSI TS 103 221-1 V1.95.1 | Lawful Interception (LI); Part 1: Internal Network Interface X1 for Lawful Interception |
| ETSI TS 103 221-2 V1.541.1 | Lawful Interception (LI); Part 2: Internal Network Interface X2/X3 for Lawful Interception |
| ETSI TS 103 120 V1.933.1 | Lawful Interception (LI); Interface for warrant information |
| ETSI TS 103 280 V2.663.1 | Lawful Interception (LI); Dictionary for common parameters |
| ETSI TS 132 298 V1665.97.0 | Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; Charging Data Record (CDR) parameter description |
| ETSI TS 133 107 V1665.06.0 | Universal Mobile Telecommunications System (UMTS); LTE; 3G security; Lawful interception architecture and functions |

| | |
|---|---|
| ETSI TS 133 108 V165.45.0 | Universal Mobile Telecommunications System (UMTS); LTE;3G security; Handover interface for Lawful Interception (LI) |
| ETSI TS 133 127 V165.92.0 | Technical Specification Group Services and System Aspects; 5G Security; Lawful Interception (LI) architecture and functions |
| ETSI TS 133 128 V165.81.0 | 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 V165.34.0 | Universal Mobile Telecommunications System (UMTS); Mobile Application Part (MAP) specification |
| ETSI TS 123 228 V165.64.0 | IP Multimedia Subsystem (IMS); Stage 2 |
| ETSI TS 124 229 V165.107.0 | IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 |
| 3GPP TS 23.003 V165.7.0 | Universal Mobile Telecommunications System (UMTS); Numbering, addressing and identification |
| 3GPP TS 23.008 V165.37.0 | Technical Specification Group Core Network and Terminals; Organization of subscriber data; |
| 3GPP TS 23.032 V165.01.0 | Universal Mobile Telecommunications System (UMTS); Universal Geographical  Area Description (GAD) |
| 3GPP TS 23.040 V165.03.0 | Technical Specification Group Core Network and Terminals; Technical realization of the Short Message Service (SMS) |
| 3GPP TS 23.060 V165.05.0 | Universal Mobile Telecommunications System (UMTS); General Packet Radio Service (GPRS); Service description; Stage 2 |
| 3GPP TS 23.204 V16.0.0 | Technical Specification Group Core Network and Terminals; Support of Short Message Service (SMS) over generic 3GPP Internet Protocol (IP) access; Stage 2 |
| 3GPP TS 23.271 V16.0.0 | Technical Specification Group Core Network and Terminals; Functional stage 2 description of Location Services (LCS) |
| 3GPP TS 23.272 V165.0.0 | LTE; Circuit Switched (CS) fallback in Evolved Packet System (EPS); Stage 2 |
| 3GPP TS 23.273 V16.7.0 | Technical Specification Group Core Network and Terminals; 5G System (5GS) Location Services (LCS); Stage 2 |
| 3GPP TS 23.316 V16.7.0 | Technical Specification Group Core Network and Terminals; Wireless and wireline convergence access support for the 5G System (5GS) |

| 3GPP TS 23.401 V16~~5~~.11~~7~~.0 | LTE; General Packet Radio Service (GPRS) enhancements for  Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access |
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| 3GPP TS 23.402 V16~~5~~.0~~3~~.0 | Universal Mobile Telecommunications System (UMTS); LTE; Architecture enhancements for non-3GPP accesses |
| 3GPP TS 23.501 V16~~5~~.10~~6~~.0 | Technical Specification Group Services and System Aspects; System Architecture for the 5G System; Stage 2 |
| 3GPP TS 23.502 V16~~5~~.10~~6~~.0 | Technical Specification Group Services and System Aspects; Procedures for the 5G System; Stage 2 |
| 3GPP TS 23.503 V16~~5~~.10~~6~~.0 | Technical Specification Group Services and System Aspects; Policy and Charging Control Framework for the 5G System; Stage 2 |
| 3GPP TS 24.007 V16~~5~~.5~~3~~.0 | Technical Specification Group Core Network and Terminals; Mobile radio interface signalling layer 3; General aspects |
| 3GPP TS 24.341 V16.0.0 | Technical Specification Group Core Network and Terminals; Support of SMS over IP networks; Stage 3 |
| 3GPP TS 24.501 V16~~5~~.10~~4~~.0 | Technical Specification Group Services and System Aspects; Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3 |
| 3GPP TS 24.502 V16~~5~~.8~~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 V16~~5~~.0~~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 V16~~5~~.4~~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 V16~~5~~.9~~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 V16~~5~~.9~~4~~.0 | Technical Specification Group Core Network and Terminals; 5G System; Access and Mobility Management Services; Stage 3 |
| 3GPP TS 29.520 V16~~5~~.9~~4~~.0 | Technical Specification Group Core Network and Terminals; 5G System; Network Data Analytics Services; Stage 3 |
| 3GPP TS 29.540 V16~~5~~.9~~4~~.0 | Technical Specification Group Core Network and Terminals; 5G System; SMS Services; Stage 3 |
| 3GPP TS 29.561 V16.8.0 | Technical Specification Group Core Network and Terminals; 5G System; Interworking between 5G Network and external Data Networks; Stage 3 |
| 3GPP TS 29.562 V16.6.0 | Technical Specification Group Core Network and Terminals; 5G System; Home Subscriber Server (HSS) services; Stage 3 |

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| 3GPP TS 29.563 V16.6.0 | Technical Specification Group Core Network and Terminals; 5G System; Home Subscriber Server (HSS) services for interworking with Unified Data Management (UDM); Stage 3 |
| 3GPP TS 29.571 V16 5.5 4.0 | Technical Specification Group Core Network and Terminals; 5G System; Common Data Types for Service Based Interfaces; Stage 3 |
| 3GPP TS 29.572 V16 5.7 4.0 | Technical Specification Group Core Network and Terminals; 5G System; Location Management Services; Stage 3 |
| 3GPP TS 29.573 V16.8.0 | Technical Specification Group Core Network and Terminals; 5G System; Public Land Mobile Network (PLMN) Interconnection; Stage 3 |
| 3GPP TS 32.251 V16 5.0 5.0 | Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; Packet Switched (PS) domain charging |
| 3GPP TS 32.255 V16 5.10 3.0 | Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; 5G data connectivity domain charging; |
| 3GPP TS 32.260 V16 5.3 2.0 | Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; IP Multimedia Subsystem (IMS) charging |
| 3GPP TS 32.291 V16 5.9 3.10 | Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; 5G system, charging service; Stage 3 |
| 3GPP TS 33.401 V16 5.3 8.0 | Technical Specification Group Services and System Aspects; 3GPP System Architecture Evolution (SAE); Security architecture |
| 3GPP TS 33.501 V16 5.8 5.10 | Technical Specification Group Services and System Aspects; Security architecture and procedures for 5G system |
| 3GPP TS 36.300 V16.6.0 | Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2 |
| 3GPP TS 36.413 V16 5.6 5.0 | Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP) |
| 3GPP TS 37.340 V16 5.6.0 | Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA) and NR; Multi-connectivity; Stage 2 |
| 3GPP TS 37.355 V16.5.0 | Technical Specification Group Radio Access Network; LTE Positioning Protocol (LPP) |
| 3GPP TS 38.300 V16.6.0 | Technical Specification Group Radio Access Network; NR; NR and NG-RAN Overall Description; Stage 2 |
| 3GPP TS 38.413 V16 5.6 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 3261 | SIP: Session Initiation Protocol |
| IETF RFC 4122 | A Universally Unique IDentifier (UUID) URN Namespace |
| IETF RFC 4180 | Common Format and MIME Type for Comma-Separated Values (CSV) Files |

| IETF RFC 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 |
| IETF RFC 6530 | Overview and Framework for Internationalized Email |
| 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) |
| BBF TR-470 Issue 1 (08/2020) | Broadband Forum, 5G Wireless Wireline Convergence Architecture. Issue 1, Issue Date: August 2020 |
| GSMA SGP.01 V4.0 | GSM Association, Official Document SGP.01; Embedded SIM Remote Provisioning Architecture |
| GSMA SGP.02 V4.0 | GSM Association, Official Document SGP.02; Remote Provisioning Architecture for Embedded UICC Technical Specification |

**Table 10-110-1: List of technical specifications**