

ETSI TS 103 280 V2.11.1 (2024-01)



Lawful Interception (LI); Dictionary for common parameters



Reference

RTS/LI-00253

Keywords

dictionary, lawful interception, security

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from:
<https://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at <https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:
<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

If you find a security vulnerability in the present document, please report it through our Coordinated Vulnerability Disclosure Program:
<https://www.etsi.org/standards/coordinated-vulnerability-disclosure>

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.
The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2024.
All rights reserved.

Contents

| | |
|---|----|
| Intellectual Property Rights | 5 |
| Foreword..... | 5 |
| Modal verbs terminology..... | 5 |
| 1 Scope | 6 |
| 2 References | 6 |
| 2.1 Normative references | 6 |
| 2.2 Informative references..... | 8 |
| 3 Definition of terms, symbols and abbreviations..... | 8 |
| 3.1 Terms..... | 8 |
| 3.2 Symbols..... | 8 |
| 3.3 Abbreviations | 8 |
| 4 Release management | 9 |
| 5 Parameter requirements..... | 9 |
| 5.0 Introduction | 9 |
| 5.1 Parameter attributes..... | 10 |
| 5.2 Parameter naming conventions..... | 10 |
| 5.3 Technology conventions..... | 10 |
| 5.4 Regular expression conventions | 11 |
| 6 Parameter dictionary..... | 11 |
| 6.1 LIID..... | 11 |
| 6.2 UTCDateTime | 12 |
| 6.3 UTCMicrosecondDateTime | 12 |
| 6.4 QualifiedDateTime | 12 |
| 6.5 QualifiedMicrosecondDateTime | 13 |
| 6.6 InternationalE164 | 13 |
| 6.7 IMSI | 13 |
| 6.8 IMEI | 13 |
| 6.9 IMEICheckDigit..... | 14 |
| 6.10 IMEISV | 14 |
| 6.11 IPv4Address | 14 |
| 6.12 IPv4CIDR..... | 14 |
| 6.13 IPv6Address | 15 |
| 6.14 IPv6CIDR..... | 15 |
| 6.15 IPAddress | 15 |
| 6.16 IPCIDR..... | 16 |
| 6.17 TCPPort..... | 16 |
| 6.18 TCPPortRange..... | 16 |
| 6.19 UDPPort | 17 |
| 6.20 UDPPortRange | 17 |
| 6.21 Port | 17 |
| 6.22 PortRange | 18 |
| 6.23 IPAddressPort..... | 18 |
| 6.24 IPAddressPortRange | 18 |
| 6.25 MACAddress..... | 19 |
| 6.26 EmailAddress | 19 |
| 6.27 UUID | 19 |
| 6.28 ISOCountryCode..... | 19 |
| 6.29 ShortString | 20 |
| 6.30 LongString..... | 20 |
| 6.31 SIPURI | 20 |
| 6.32 TELURI..... | 20 |
| 6.33 WGS84CoordinateDecimal | 21 |
| 6.34 WGS84LatitudeDecimal | 21 |

| | | |
|-------------------------------|---|-----------|
| 6.35 | WGS84LongitudeDecimal | 21 |
| 6.36 | WGS84CoordinateAngular | 21 |
| 6.37 | WGS84LatitudeAngular | 22 |
| 6.38 | WGS84LongitudeAngular | 22 |
| 6.39 | SUPIIMSI | 22 |
| 6.40 | SUPINAI | 23 |
| 6.41 | SUCI | 23 |
| 6.42 | PEIIMEI | 23 |
| 6.43 | PEIIMEICheckDigit | 23 |
| 6.44 | PEIIMEISV | 24 |
| 6.45 | GPSIMSISDN | 24 |
| 6.46 | GPSINAI | 24 |
| 6.47 | NAI | 24 |
| 6.48 | LDID | 25 |
| 6.49 | InternationalizedEmailAddress | 25 |
| 6.50 | EUI64 | 25 |
| 6.51 | CGI | 25 |
| 6.52 | ECGI | 26 |
| 6.53 | NCGI | 26 |
| 6.54 | ICCID | 26 |
| 6.55 | IPProtocol | 26 |
| 6.56 | VLANID | 26 |
| 7 | Technical implementation | 27 |
| 7.1 | XSD | 27 |
| 7.2 | ASN.1 | 27 |
| 7.3 | JSON | 27 |
| Annex A (normative): | XSD definition | 28 |
| Annex B (normative): | ASN.1 definition | 32 |
| Annex C (informative): | XSD to JSON schema translation | 34 |
| C.1 | Overview | 34 |
| C.2 | General translation rules | 34 |
| C.3 | Translation of simple types | 34 |
| C.3.1 | Translation rules | 34 |
| C.3.2 | Restrictions of XSD native simple types | 34 |
| C.3.3 | Restrictions of other simple types | 35 |
| C.4 | Translation of complex types | 35 |
| C.4.1 | Translation rules | 35 |
| C.4.2 | Translation of sequences | 35 |
| C.4.3 | Translation of choices | 36 |
| Annex D (informative): | Change Request history | 37 |
| History | | 38 |

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Foreword

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

The ASN.1, JSON Schema and XSD technical implementations are both available as an electronic attachment to the present document.

Modal verbs terminology

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

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document defines a dictionary of parameters that are commonly used in multiple TC LI specifications. Aside from defining a dictionary, the present document aims to provide technical means for other specifications to use. It is encouraged to use the present document in the development of new specifications.

It is foreseen that regular maintenance of the present document is required. As such, release management requirements will be defined.

Before accepting any new common parameter, the present document will provide a set of requirements the parameter has to comply to in order to become a common parameter.

2 References

2.1 Normative references

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

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

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

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

- [1] [ETSI TS 102 232-1](#): "Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 1: Handover specification for IP delivery".
- [2] [W3C® Recommendation 5 April 2012](#): "W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes".
- [3] [Recommendation ITU-T X.680](#): "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [4] [Recommendation ITU-T E.164](#): "The international public telecommunication numbering plan".
- [5] [Recommendation ITU-T E.212](#): "The international identification plan for public networks and subscriptions".
- [6] [ETSI TS 123 003](#): "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; 5G; Numbering, addressing and identification (3GPP TS 23.003)".
- [7] [ETSI TS 102 657](#): "Lawful Interception (LI); Retained data handling; Handover interface for the request and delivery of retained data".
- [8] [IETF RFC 791](#): "Internet Protocol".
- [9] [IETF RFC 4632](#): "Classless Inter-domain Routing (CIDR): The Internet Address Assignment and Aggregation Plan".
- [10] [IETF RFC 8200](#): "Internet Protocol, Version 6 (IPv6) Specification".
- [11] [IETF RFC 4291](#): "IP Version 6 Addressing Architecture".
- [12] [IETF RFC 793](#): "Transmission Control Protocol".

NOTE: IETF RFC 793 has been obsoleted by IETF RFC 9293.

- [13] [IETF RFC 768](#): "User Datagram Protocol".
- [14] [IEEE 802.3™](#): "IEEE Standard for Ethernet".
- [15] [IETF RFC 5322](#): "Internet Message Format".
- [16] WHATWG community: "[HTML Living standard](#)".
- [17] [IETF RFC 4122](#): "A Universally Unique IDentifier (UUID) URN Namespace".
- [18] [ISO 3166-1](#): "Codes for the representation of names of countries and their subdivisions -- Part 1: Country codes".
- [19] Void.
- [20] [ISO/IEC 7812-1:2017](#): "Identification cards -- Identification of issuers -- Part 1: Numbering system".
- [21] [IETF RFC 3261](#): "SIP: Session Initiation Protocol".
- [22] [IETF RFC 3966](#): "The tel URI for Telephone Numbers".
- [23] [NIMA Technical Report 8350.2](#): "Department of Defense World Geodetic System 1984, Its Definition and Relationships With Local Geodetic Systems".
- [24] [ETSI TS 123 501](#): "5G; System architecture for the 5G System (5GS) (3GPP TS 23.501)".
- [25] [ETSI TS 133 501](#): "5G; Security architecture and procedures for 5G System (3GPP TS 33.501)".
- [26] [IETF RFC 7542](#): "The Network Access Identifier".
- [27] [ETSI TS 124 501](#): "5G; Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3 (3GPP TS 24.501)".
- [28] [ETSI TS 103 120](#): "Lawful Interception (LI); Interface for warrant information".
- [29] [W3C® Recommendation 16 August 2006](#): "Extensible Markup Language (XML) 1.1 (Second Edition)".
- [30] [IETF RFC 6530](#): "Overview and Framework for Internationalized Email".
- [31] [IETF RFC 7042](#): "IANA Considerations and IETF Protocol and Documentation Usage for IEEE 802 Parameters".
- [32] [ETSI TS 102 221](#): "Smart Cards; UICC-Terminal interface; Physical and logical characteristics".
- [33] [ETSI TS 129 571](#): "5G; 5G System; Common Data Types for Service Based Interfaces; Stage 3 (3GPP TS 29.571)".
- [34] IANA: "[Assigned Internet Protocol Numbers](#)".
- [35] [IETF Draft draft-bhutton-json-schema-01](#): "JSON Schema: A Media Type for Describing JSON Documents".
- [36] [ECMA-262](#): "ECMAScript® 2023 Language Specification".
- [37] [IEEE 802.1Q™-2014](#): "IEEE Standard for Local and metropolitan area networks -- Bridges and Bridged Networks".

2.2 Informative references

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

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

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

Not applicable.

3 Definition of terms, symbols and abbreviations

3.1 Terms

Void.

3.2 Symbols

Void.

3.3 Abbreviations

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

| | |
|---------|---|
| 3GPP | 3 rd Generation Partnership Project |
| ASCII | American Standard Code for Information Interchange |
| ASN.1 | Abstract Syntax Notation One |
| CC | Content of Communication |
| CI | Cell Identity |
| CGI | Cell Global Identification |
| CIDR | Classless Inter-Domain Routing |
| CSP | Communications Service Provider |
| E-UTRAN | Evolved Universal Terrestrial Radio Access Network |
| ECGI | E-UTRAN Cell Global Identification |
| ECI | E-UTRAN Cell Identity |
| EUI | Extended Unique Identifier |
| GPSI | Generic Public Subscription Identifier |
| HEX | HEXadecimal |
| HI | Handover Interface |
| HI1 | Handover Interface port 1 (for administrative information) |
| HI2 | Handover Interface port 2 (for Intercept Related Information) |
| HI3 | Handover Interface port 3 (for Content of Communication) |
| IANA | Internet Assigned Numbers Authority |
| ICCID | Integrated Circuit Card Identifier |
| IEC | International Electrotechnical Commission |
| IEEE | Institute of Electrical and Electronics Engineers |
| IEI | Information Element Identifier |
| IETF | Internet Engineering Task Force |
| IMEI | International Mobile station Equipment Identity |
| IMEISV | International Mobile station Equipment Identity and Software Version number |
| IMSI | International Mobile Subscriber Identity |
| IP | Internet Protocol |
| IPv4 | Internet Protocol version 4 |

| | |
|-------|---|
| IPv6 | Internet Protocol version 6 |
| IRI | Intercept Related Information |
| ISO | International Organization for Standardization |
| ITU-T | International Telecommunication Union - Telecommunication |
| JSON | JavaScript Object Notation |
| LAC | Location Area Code |
| LDID | Lawful Disclosure IDentifier |
| LEA | Law Enforcement Agency |
| LIID | Lawful Interception Identifier |
| MAC | Media Access Control |
| MCC | Mobile Country Code |
| MNC | Mobile Network Code |
| NAI | Network Access Identifier |
| NCGI | NR Cell Global Identification |
| NCI | NR Cell Identity |
| NIMA | National Imagery and Mapping Agency |
| NR | New Radio |
| PEI | Permanent Equipment Identifier |
| RFC | Request For Comments |
| SIP | Session Initialization Protocol |
| SUCI | Subscription Concealed Identifier |
| SUPI | Subscription Permanent Identifier |
| TCP | Transmission Control Protocol |
| UDP | User Datagram Protocol |
| URI | Uniform Resource Identifier |
| UTC | Coordinated Universal Time |
| UUID | Universally Unique IDentifier |
| VLAN | Virtual Local Area Network |
| WGS84 | World Geodetic System 1984 |
| XML | eXtended Markup Language |
| XSD | XML Schema Definition |

4 Release management

This clause describes the release management requirements. The requirements are:

- The version of the present document is defined as <major>.<minor>.<patch>.
- The major version should be incremented when making a backwards incompatible change.
- The minor version should be incremented when adding backwards compatible functionality.
- The patch version should be incremented when fixing a backwards compatible bug.
- Once a major version has been incremented, the previous major version will be supported for 2 years after publication of the new version. Change requests issued to a version that is no longer supported will need to be issued for the latest supported major version.

5 Parameter requirements

5.0 Introduction

This clause describes the requirements a parameter should comply to in order to be specified as a common parameter.

5.1 Parameter attributes

Name

- The parameter should be assigned a unique name. The naming conventions used are described in clause 5.2.

Description

- A description of the parameter should be provided.

Usage guidance

- If there are circumstances in which additional usage guidance is applicable, use cases may be described in this attribute.

References to other specifications

- If the parameter is specified in another specification (such as an RFC), a reference to that specification shall be provided. If possible, the reference should point to the exact clause in the specification.

EXAMPLE: Specify one or more sample values of the parameter.

Technical means to define and validate the parameter

- If possible, provide a regular expression to specify the value that is accepted by this parameter. Implementations may be required to perform additional validation on the value. The regular expression is defined per clause 5.4. Define the parameter in the XSD [2] in clause 7.1. When converting a regular expression to an XSD [2] pattern, escape any XML [29] markup characters in the regular expression per XML [29], section 2.4 to create a valid XSD [2] pattern.
- Define the parameter in the ASN.1 [3] in clause 7.2.
- Define the parameter in the JSON Schema [35] in clause 7.3. Unless otherwise specified, the JSON definition shall be a translation of the XSD definition, following the translation given in annex C.

5.2 Parameter naming conventions

Allowed characters

- The following character classes are allowed: A-Z, a-z and 0-9.

Camel casing

- The name of the parameter is to be CamelCased, where the first character is uppercased. Any acronyms should be uppercased.

EXAMPLE:

- IPv4Address.
- SIPURI.
- EmailAddress.

5.3 Technology conventions

The used technologies defined in clause 7 may impose requirements that conflict with the requirements in clauses 5.1 and 5.2. In the case of a conflict and in exceptional cases, it is allowed to deviate from the requirements above.

5.4 Regular expression conventions

Regular expressions used for validation shall be limited to the regular expression capabilities supported by both XSD [2] patterns and ECMAScript regular expressions (see ECMA-262 [36], section 22.2.1, as used by JSON Schema [35] patterns).

Given the high disparity of regular expression implementations, the regular expressions should be limited to the following features (inspired by JSON Schema [35], section 6.4):

1. Individual Unicode characters. Unicode characters for XSD [2] need to be encoded using an appropriate XML [29] entity.
2. Character classes: "[abc]" (simple character classes), and "[a-z]" (range character classes).
3. Negated character classes: "^abc" (negated simple character classes), and "[^a-z]" (negated range character classes).
4. Simple quantifiers: "." (any character except new line and line feed), "*" (zero or more occurrences), "+" (one or more occurrence), and "?" (zero or one occurrence).
5. Range quantifiers: "{ n }" (exactly n occurrences), "{ n , m }" (between n and m occurrences), and "{ n , }" (at least n occurrences).
6. Grouping and alternation: "(" and ")" (simple grouping), and "|" (alternation).

As XSD [2] patterns are matched to the entire value, regular expressions shall not start with the anchor "^" or end with the anchor "\$". When regular expressions are mapped to a JSON Schema [35] pattern per table C.2, the anchors are required.

6 Parameter dictionary

6.1 LIID

| Name | LIID |
|--------------------|---|
| Description | <p>For each target identity related to an interception measure, the authorized CSP operator shall assign a special Lawful Interception IDentifier (LIID), which has been agreed between the LEA and the CSP. It is used within parameters of all HI interface ports.</p> <p>Using an indirect identification, pointing to a target identity makes it easier to keep the knowledge about a specific interception target limited within the authorized CSP operators and the handling agents at the LEA.</p> <p>The Lawful Interception IDentifier LIID is a component of the CC delivery procedure and of the IRI records. It shall be used within any information exchanged at the Handover Interfaces HI2 and HI3 for identification and correlation purposes.</p> <p>The LIID format shall consist of alphanumeric characters. It might for example, among other information, contain a lawful authorization reference number, and the date, when the lawful authorization was issued.</p> <p>The authorized CSP shall either enter a unique LIID for each target identity of the interception subject or as a national option a single LIID for multiple target identities all pertaining to the same interception subject.</p> <p>EXAMPLE: The interception subject has a telephony service with three telephone numbers. The CSP enters for each telephone number an own LIID, or optionally enters one LIID for all three telephone numbers.</p> <p>If more than one LEA intercepts the same target identity, there shall be unique LIIDs assigned, relating to each LEA.</p> |

| | |
|---------------------------|---|
| Usage guidance | The LIID is defined as an OCTET STRING in ASN.1. This means it is possible to use binary octets or ASCII printable characters to express the LIID. To correctly handle this, the parameter accepts both variations. |
| References | ETSI TS 102 232-1 [1], clause 5.2.2. |
| Example | ZZZ123 (ASCII printable LIID) 46565527098f6bcd4621d373cade4e832627b4f6ff00ff00ff (Binary LIID, represented in HEX) |
| Regular expression | ([!~]{1,25}) ([0-9a-f]{26,50}) |
| XSD | LIID, simpleType |
| ASN.1 | LIID, OCTET STRING (SIZE(1..25)) |

6.2 UTCDateTime

| | |
|---------------------------|--|
| Name | UTCDateTime |
| Description | A UTC timestamp with second precision |
| Usage guidance | - |
| References | W3C XML Schema Definition Language [2], section 3.3.7 |
| Example | 2015-12-27T13:37:00Z |
| Regular expression | [0-9]{4}-[0-9]{2}-[0-9]{2}T[0-9]{2}:[0-9]{2}:[0-9]{2}Z |
| XSD | UTCDateTime, simpleType |
| ASN.1 | Not defined |

6.3 UTCMicrosecondDateTime

| | |
|---------------------------|--|
| Name | UTCMicrosecondDateTime |
| Description | A UTC timestamp with microsecond precision |
| Usage guidance | - |
| References | W3C XML Schema Definition Language [2], section 3.3.7 |
| Example | 2015-12-27T13:37:00.012345Z |
| Regular expression | [0-9]{4}-[0-9]{2}-[0-9]{2}T[0-9]{2}:[0-9]{2}:[0-9]{2}\.[0-9]{6}Z |
| XSD | UTCMicrosecondDateTime, simpleType |
| ASN.1 | Not defined |

6.4 QualifiedDateTime

| | |
|---------------------------|---|
| Name | QualifiedDateTime |
| Description | A timestamp with second precision and timezone qualifier |
| Usage guidance | - |
| References | W3C XML Schema Definition Language 1.1 Part 2: Datatypes [2], section 3.3.7 |
| Example XML | 2015-12-27T13:37:00+02:00 |
| Example ASN.1 | 20151227133700+0200 |
| Regular expression | [0-9]{4}-[0-9]{2}-[0-9]{2}T[0-9]{2}:[0-9]{2}:[0-9]{2}(Z [+-] [0-9]{2}:[0-9]{2}) |
| XSD | QualifiedDateTime, simpleType |
| ASN.1 | QualifiedDateTime, GeneralizedTime Timestamps shall be provided with a timezone qualifier. The fractional part of a second shall not be present. Local time format shall not be used |

6.5 QualifiedMicrosecondDateTime

| | |
|---------------------------|---|
| Name | QualifiedMicrosecondDateTime |
| Description | A timestamp with microsecond precision and timezone qualifier |
| Usage guidance | - |
| References | W3C XML Schema Definition Language 1.1 Part 2: Datatypes [2], section 3.3.7 |
| Example XML | 2015-12-27T13:37:00.012345+02:00 |
| Example ASN.1 | 20151227133700.012345+0200 |
| Regular expression | [0-9]{4}-[0-9]{2}-[0-9]{2}T[0-9]{2}:[0-9]{2}:[0-9]{2}\.[0-9]{6}(Z [+-][0-9]{2}:[0-9]{2}) |
| XSD | QualifiedMicrosecondDateTime, simpleType |
| ASN.1 | QualifiedMicrosecondDateTime, GeneralizedTime Timestamps shall be provided with a timezone qualifier. The fractional part of a second with no more than 6 digits shall be present. Local time format shall not be used |

6.6 InternationalE164

| | |
|---------------------------|---|
| Name | InternationalE164 |
| Description | E.164 Number in fully international format, written as decimal digits |
| Usage guidance | - |
| References | Recommendation ITU-T E.164 [4], clause 6 |
| Example | 447700900123 |
| Regular expression | [0-9]{1,15} |
| XSD | InternationalE164, simpleType |
| ASN.1 | NumericString (SIZE(1..15)) |

6.7 IMSI

| | |
|---------------------------|---|
| Name | IMSI |
| Description | International Mobile Subscriber Identity, written as decimal digits |
| Usage guidance | - |
| References | Recommendation ITU-T E.212 [5], clause 6.1 3GPP TS 23.003 [6], clauses 2.2 and 2.3 |
| Example | 999999123456789 |
| Regular expression | [0-9]{6,15} |
| XSD | IMSI, simpleType |
| ASN.1 | NumericString (SIZE(6..15)) |

6.8 IMEI

| | |
|---|--|
| Name | IMEI |
| Description | International Mobile station Equipment Identity, written as decimal digits without the Luhn check digit, annex B of ISO/IEC 7812-1 [20] |
| Usage guidance | To avoid implementation issues, the IMEI parameter explicitly excludes the Luhn check digit, annex B of ISO/IEC 7812-1 [20] (See notes 1 and 2) |
| References | 3GPP TS 23.003 [6], clause 6 |
| Example | 00997123456789 |
| Regular expression | [0-9]{14} |
| XSD | IMEI, simpleType |
| ASN.1 | NumericString (SIZE(14)) |
| NOTE 1: ETSI TS 102 657 [7], clause E.3 identifies potential issues with the inclusion/exclusion of the check digit. As such, the IMEI parameter is explicitly specified without the check digit. | |
| NOTE 2: The IMEICheckDigit parameter can be used when the check digit is explicitly required. | |

6.9 IMEICheckDigit

| | |
|---------------------------|--|
| Name | IMEICheckDigit |
| Description | International Mobile station Equipment Identity, written as decimal digits with the Luhn check digit, annex B of ISO/IEC 7812-1 [20] |
| Usage guidance | - |
| References | 3GPP TS 23.003 [6], clause 6 |
| Example | 009971234567892 |
| Regular expression | [0-9]{15} |
| XSD | IMEICheckDigit, simpleType |
| ASN.1 | NumericString (SIZE(15)) |

6.10 IMEISV

| | |
|---------------------------|---|
| Name | IMEISV |
| Description | International Mobile station Equipment Identity and Software Version Number as defined in 3GPP TS 23.003 [6], clause 6.2.2, written as decimal digits including a software version number instead of a Luhn check digit |
| Usage guidance | - |
| References | 3GPP TS 23.003 [6], clause 6.2.2 |
| Example | 0099712345678999 |
| Regular expression | [0-9]{16} |
| XSD | IMEISV, simpleType |
| ASN.1 | NumericString (SIZE(16)) |

6.11 IPv4Address

| | |
|---------------------------|--|
| Name | IPv4Address |
| Description | IPv4 address, written in dotted decimal notation |
| Usage guidance | - |
| References | IETF RFC 791 [8] |
| Example | 192.0.2.1 |
| Regular expression | ((25[0-5] 2[0-4][0-9] [01]?[0-9]?[0-9])\.){3}(25[0-5] 2[0-4][0-9] [01]?[01]?[0-9]?[0-9]) |
| XSD | IPv4Address, simpleType |
| ASN.1 | Not defined |

6.12 IPv4CIDR

| | |
|---------------------------|---|
| Name | IPv4CIDR |
| Description | IPv4 CIDR, written in dotted decimal notation followed by CIDR notation |
| Usage guidance | - |
| References | IETF RFC 791 [8] and IETF RFC 4632 [9] |
| Example | 192.0.2.0/24 |
| Regular expression | ((25[0-5] 2[0-4][0-9] [01]?[0-9]?[0-9])\.){3}(25[0-5] 2[0-4][0-9] [01]?[01]?[0-9]?[0-9])/(([1-2]?[0-9] 3[0-2])) |
| XSD | IPv4CIDR, simpleType |
| ASN.1 | Not defined |

6.13 IPv6Address

| | |
|---------------------------|--|
| Name | IPv6Address |
| Description | IPv6 address, written as eight groups of four hexadecimal digits separated by a colon |
| Usage guidance | It is recognized that IPv6 address formatting has various options. To reduce complexity in technical implementations, the IPv6Address parameter restricts the address to the fully uncompressed representation of the IPv6 address |
| References | IETF RFC 8200 [10] |
| Example | 2001:0db8:0000:0000:0000:0000:0000:0001 |
| Regular expression | ([0-9a-f]{4}:){7}([0-9a-f]{4}) |
| XSD | IPv6Address, simpleType |
| ASN.1 | Not defined |

6.14 IPv6CIDR

| | |
|---------------------------|--|
| Name | IPv6CIDR |
| Description | IPv6 CIDR, written as eight groups of four hexadecimal digits separated by a colon followed by CIDR notation |
| Usage guidance | See IPv6Address parameter for usage guidance |
| References | IETF RFC 8200 [10], IETF RFC 4632 [9] and IETF RFC 4291 [11] |
| Example | 2001:0db8:0000:0000:0000:0000:0000:0000/48 |
| Regular expression | ([0-9a-f]{4}:){7}([0-9a-f]{4})/(((1-9)[0-9]?) (1[0-1][0-9]) (12[0-8])) |
| XSD | IPv6CIDR, simpleType |
| ASN.1 | Not defined |

6.15 IPAddress

| | |
|---------------------------|--|
| Name | IPAddress |
| Description | Either a IPv4Address parameter or IPv6Address parameter |
| Usage guidance | - |
| References | - |
| Example | <p>XSD</p> <pre><IPAddress> <IPv4Address>192.0.2.1</IPv4Address> </IPAddress></pre> <p>or</p> <pre><IPAddress> <IPv6Address>2001:0db8:0000:0000:0000:0000:0000:0001</IPv6Address> </IPAddress></pre> |
| Regular expression | - |
| XSD | IPAddress, complexType |
| ASN.1 | Not defined |

6.16 IPCIDR

| | |
|---------------------------|---|
| Name | IPCIDR |
| Description | Either a IPv4CIDR parameter or IPv6CIDR parameter |
| Usage guidance | - |
| References | - |
| Example | <p>XSD</p> <pre><IPCIDR> <IPv4CIDR>192.0.2.0/24</IPv4CIDR> </IPCIDR></pre> <p>or</p> <pre><IPCIDR> <IPv6CIDR>2001:0db8:0000:0000:0000:0000:0000/48</IPv6CIDR> </IPCIDR></pre> |
| Regular expression | - |
| XSD | IPCIDR, complexType |
| ASN.1 | Not defined |

6.17 TCPPort

| | |
|---------------------------|---|
| Name | TCPPort |
| Description | TCP port, written in decimal notation |
| Usage guidance | - |
| References | IETF RFC 793 [12] |
| Example | 22 |
| Regular expression | (([1-9][0-9]{0,3} [1-5][0-9]{4} 6[0-4][0-9]{3} 65[0-4][0-9]{2} 655[0-2][0-9] 6553[0-5]) |
| XSD | TCPPort, simpleType |
| ASN.1 | TCPPort, INTEGER (1..65535) |

6.18 TCPPortRange

| | |
|---------------------------|---|
| Name | TCPPortRange |
| Description | TCP port range, consists of a 'start' TCPPort parameter and an 'end' TCPPort parameter |
| Usage guidance | The start and end values are inclusive, and the end value shall be equal to or greater than the start value |
| References | - |
| Example | <p>Regular expression</p> <p>1024-2048</p> <p>XSD</p> <pre><TCPPortRange> <start>1024</start> <end>2048</end> </TCPPortRange></pre> |
| Regular expression | (([1-9][0-9]{0,3} [1-5][0-9]{4} 6[0-4][0-9]{3} 65[0-4][0-9]{2} 655[0-2][0-9] 6553[0-5])-([1-9][0-9]{0,3} [1-5][0-9]{4} 6[0-4][0-9]{3} 65[0-4][0-9]{2} 655[0-2][0-9] 6553[0-5]) |
| XSD | TCPPortRange, complexType |
| ASN.1 | TCPPortRange, SEQUENCE |

6.19 UDPPort

| | |
|---------------------------|---|
| Name | UDPPort |
| Description | UDP port, written in decimal notation |
| Usage guidance | - |
| References | IETF RFC 768 [13] |
| Example | 53 |
| Regular expression | ([0-9]{1,4} [1-5][0-9]{4} 6[0-4][0-9]{3} 65[0-4][0-9]{2} 655[0-2][0-9] 6553[0-5]) |
| XSD | UDPPort, simpleType |
| ASN.1 | UDPPort, INTEGER (0..65535) |

6.20 UDPPortRange

| | |
|---------------------------|--|
| Name | UDPPortRange |
| Description | UDP port range, consists of a 'start' UDPPort parameter and an 'end' UDPPort parameter |
| Usage guidance | The start and end values are inclusive, and the end value shall be equal to or greater than the start value |
| References | - |
| Example | Regular expression 2048-4096 XSD <UDPPortRange> <start>2048</start> <end>4096</end> </UDPPortRange> |
| Regular expression | ([0-9]{1,4} [1-5][0-9]{4} 6[0-4][0-9]{3} 65[0-4][0-9]{2} 655[0-2][0-9] 6553[0-5])-([0-9]{1,4} [1-5][0-9]{4} 6[0-4][0-9]{3} 65[0-4][0-9]{2} 655[0-2][0-9] 6553[0-5]) |
| XSD | UDPPortRange, complexType |
| ASN.1 | UDPPortRange, SEQUENCE |

6.21 Port

| | |
|---------------------------|---|
| Name | Port |
| Description | Either a TCPPort parameter or a UDPPort parameter |
| Usage guidance | - |
| References | - |
| Example | XSD <Port> <TCPPort>22</TCPPort> </Port> |
| Regular expression | ([0-9]{1,4} [1-5][0-9]{4} 6[0-4][0-9]{3} 65[0-4][0-9]{2} 655[0-2][0-9] 6553[0-5]) |
| XSD | Port, complexType |
| ASN.1 | Port, CHOICE |

6.22 PortRange

| | |
|---------------------------|--|
| Name | PortRange |
| Description | Either a TCPPortRange parameter or a UDPPortRange parameter |
| Usage guidance | The start and end values are inclusive |
| References | - |
| Example | <pre>XSD <PortRange> <TCPPortRange> <start>2048</start> <end>4096</end> </TCPPortRange> </PortRange></pre> |
| Regular expression | - |
| XSD | PortRange, complexType |
| ASN.1 | PortRange, CHOICE |

6.23 IPAddressPort

| | |
|---------------------------|--|
| Name | IPAddressPort |
| Description | Combination of an IPAddress parameter and a Port parameter |
| Usage guidance | - |
| References | - |
| Example | <pre>XSD <IPAddressPort> <address> <IPv4Address>192.0.2.1</IPv4Address> </address> <port> <TCPPort>22</TCPPort> </port> </IPAddressPort></pre> |
| Regular expression | - |
| XSD | IPAddressPort, complexType |
| ASN.1 | Not defined |

6.24 IPAddressPortRange

| | |
|---------------------------|---|
| Name | IPAddressPortRange |
| Description | Combination of an IPAddress parameter and a PortRange parameter |
| Usage guidance | - |
| References | - |
| Example | <pre>XSD <IPAddressPortRange> <address> <IPv4Address>192.0.2.1</IPv4Address> </address> <portRange> <TCPPortRange> <start>2048</start> <end>4096</end> </TCPPortRange> </portRange> </IPAddressPortRange></pre> |
| Regular expression | - |
| XSD | IPAddressPortRange, complexType |
| ASN.1 | Not defined |

6.25 MACAddress

| | |
|---------------------------|---|
| Name | MACAddress |
| Description | MAC address, written as six groups of two hexadecimal digits separated by a colon |
| Usage guidance | - |
| References | IEEE 802.3 [14]. |
| Example | 00:00:5e:00:53:12 |
| Regular expression | ([a-f0-9]{2}:){5}[a-f0-9]{2} |
| XSD | MACAddress, simpleType |
| ASN.1 | Not defined |

6.26 EmailAddress

| | |
|---------------------------|--|
| Name | EmailAddress |
| Description | E-mail address |
| Usage guidance | - |
| References | IETF RFC 5322 [15] |
| Example | john.doe@example.com |
| Regular expression | [a-zA-Z0-9.!#\$%&'*/=\?^_`{ }~-]+@[a-zA-Z0-9]([a-zA-Z0-9]{0,61}[a-zA-Z0-9])?(\.[a-zA-Z0-9]([a-zA-Z0-9]{0,61}[a-zA-Z0-9])?)?* |
| XSD | EmailAddress, simpleType |
| ASN.1 | Not defined |
| NOTE: | The regular expression above is sourced from the W3C HTML5 Recommendation [16]. |

6.27 UUID

| | |
|---------------------------|--|
| Name | UUID |
| Description | UUID |
| Usage guidance | - |
| References | IETF RFC 4122 [17] |
| Example | de305d54-75b4-431b-adb2-eb6b9e546013 |
| Regular expression | [a-f0-9]{8}-[a-f0-9]{4}-[a-f0-9]{4}-[a-f0-9]{4}-[a-f0-9]{12} |
| XSD | UUID, simpleType |
| ASN.1 | Not defined |

6.28 ISOCountryCode

| | |
|---------------------------|--|
| Name | ISOCountryCode |
| Description | An ISO 3166-1 [18] alpha-2 two-letter country code |
| Usage guidance | - |
| References | ISO 3166-1 [18] alpha-2 |
| Example | "NL" |
| Regular expression | [A-Z]{2} |
| XSD | ISOCountryCode, simpleType |
| ASN.1 | Not defined |

6.29 ShortString

| | |
|---------------------------|--|
| Name | ShortString |
| Description | A string with a maximum length of 255 characters |
| Usage guidance | - |
| References | - |
| Example | string |
| Regular expression | - |
| XSD | ShortString, simpleType |
| ASN.1 | Not defined |

6.30 LongString

| | |
|---------------------------|---|
| Name | LongString |
| Description | A string with a maximum length of 65 535 characters |
| Usage guidance | - |
| References | - |
| Example | string |
| Regular expression | - |
| XSD | LongString, simpleType |
| ASN.1 | Not defined |

6.31 SIPURI

| | |
|---------------------------|---------------------------------------|
| Name | SIPURI |
| Description | SIP URI |
| Usage guidance | - |
| References | IETF RFC 3261 [21], section 19.1 |
| Example | sip:user@example.com |
| Regular expression | sips?:[a-zA-Z0-9!#\$%&-;=?-\[\]_~%]+ |
| XSD | SIPURI, simple type |
| ASN.1 | Not defined |

6.32 TELURI

| | |
|---------------------------|-------------------------------------|
| Name | TELURI |
| Description | TEL URI |
| Usage guidance | - |
| References | IETF RFC 3966 [22] |
| Example | tel:+447700900000 |
| Regular expression | tel:[a-zA-Z0-9!#\$%&-;=?-\[\]_~%]+ |
| XSD | TELURI, simple type |
| ASN.1 | Not defined |

6.33 WGS84CoordinateDecimal

| | |
|---------------------------|---|
| Name | WGS84CoordinateDecimal |
| Description | A geographical latitude-longitude coordinate, referring to the WGS84 reference ellipsoid, given in decimal notation |
| Usage guidance | - |
| References | NIMA Technical Report 8350.2 [23] (for WGS84 definition itself, not for the syntax defined here) |
| Example | XSD <pre><WGS84CoordinateDecimal> <latitude>N43.616000</latitude> <longitude>E007.053000</longitude> </WGS84CoordinateDecimal></pre> |
| Regular expression | - |
| XSD | WGS84CoordinateDecimal, complexType |
| ASN.1 | WGS84CoordinateDecimal, SEQUENCE |

6.34 WGS84LatitudeDecimal

| | |
|---------------------------|---|
| Name | WGS84LatitudeDecimal |
| Description | A geographical latitude, referring to the WGS84 reference ellipsoid, given in decimal notation |
| Usage guidance | The latitude is given as two digits before the decimal point, left-padded with zero where necessary. The latitude is specific to six decimal places, right-padded with zero where necessary |
| References | NIMA Technical Report 8350.2 [23] (for WGS84 definition itself, not for the syntax defined here) |
| Example | N43.616000 |
| Regular expression | [NS][0-9]{2}\.[0-9]{6} |
| XSD | WGS84LatitudeDecimal, simpleType |
| ASN.1 | WGS84LatitudeDecimal, OCTET STRING (SIZE(10)) |

6.35 WGS84LongitudeDecimal

| | |
|---------------------------|---|
| Name | WGS84LongitudeDecimal |
| Description | A geographical longitude, referring to the WGS84 reference ellipsoid, given in decimal notation |
| Usage guidance | The longitude is given as three digits before the decimal point, left-padded with zero where necessary. The longitude is specific to six decimal places, right-padded with zero where necessary |
| References | NIMA Technical Report 8350.2 [23] (for WGS84 definition itself, not for the syntax defined here) |
| Example | E007.053000 |
| Regular expression | [EW][0-9]{3}\.[0-9]{6} |
| XSD | WGS84LongitudeDecimal, simpleType |
| ASN.1 | WGS84LongitudeDecimal, OCTET STRING (SIZE(11)) |

6.36 WGS84CoordinateAngular

| | |
|---------------------------|---|
| Name | WGS84CoordinateAngular |
| Description | A geographical latitude-longitude coordinate, referring to the WGS84 reference ellipsoid, given in angular notation |
| Usage guidance | - |
| References | NIMA Technical Report 8350.2 [23] (for WGS84 definition itself, not for the syntax defined here) |
| Example | XSD <pre><WGS84CoordinateAngular> <latitude>N433700.62</latitude> <longitude>E0070310.42</longitude> </WGS84CoordinateAngular></pre> |
| Regular expression | - |
| XSD | WGS84CoordinateAngular, complexType |
| ASN.1 | WGS84CoordinateAngular, SEQUENCE |

6.37 WGS84LatitudeAngular

| | |
|---------------------------|---|
| Name | WGS84LatitudeAngular |
| Description | A geographical latitude, referring to the WGS84 reference ellipsoid, given in angular notation |
| Usage guidance | Values are specified as "XDDMMSS.ss", i.e. a concatenation of the following fixed-length values, each padded with zeroes where necessary: A one-character hemisphere indicator, "N" or "S" A two-digit value indicating degrees A two-digit value indicating arc-minutes A two-digit value indicating whole arc-seconds A decimal point A two-digit value indicating fractional arc-seconds |
| References | NIMA Technical Report 8350.2 [23] (for WGS84 definition itself, not for the syntax defined here) |
| Example | N433700.62 |
| Regular expression | [NS][0-9]{6}\.[0-9]{2} |
| XSD | WGS84LatitudeAngular, simpleType |
| ASN.1 | WGS84LatitudeAngular, OCTET STRING (SIZE(10)) |

6.38 WGS84LongitudeAngular

| | |
|---------------------------|--|
| Name | WGS84LongitudeAngular |
| Description | A geographical longitude, referring to the WGS84 reference ellipsoid, given in angular notation |
| Usage guidance | Values are specified as "XDDMMSS.ss" i.e. a concatenation of the following fixed-length values, each padded with zeroes where necessary: A one-character hemisphere indicator, "E" or "W" A three-digit value indicating degrees A two-digit value indicating arc-minutes A two-digit value indicating whole arc-seconds A decimal point A two-digit value indicating fractional arc-seconds |
| References | NIMA Technical Report 8350.2 [23] (for WGS84 definition itself, not for the syntax defined here) |
| Example | E0070310.42 |
| Regular expression | [EW][0-9]{7}\.[0-9]{2} |
| XSD | WGS84LongitudeAngular, simpleType |
| ASN.1 | WGS84LongitudeAngular, OCTET STRING (SIZE(11)) |

6.39 SUPIIMSI

| | |
|---------------------------|--|
| Name | SUPIIMSI |
| Description | Subscription Permanent Identifier as defined in 3GPP TS 23.501 [24], clause 5.9.2 in IMSI representation |
| Usage guidance | In 3GPP Release 15 a SUPI may contain either an IMSI or an NAI, as defined in 3GPP TS 23.501 [24]. This representation is used for a SUPI in IMSI format |
| References | 3GPP TS 23.501 [24] 3GPP TS 23.003 [6], clause 2.2 |
| Example | See definition of IMSI |
| Regular expression | |
| XSD | |
| ASN.1 | |

6.40 SUPINAI

| | |
|---------------------------|---|
| Name | SUPINAI |
| Description | Subscription Permanent Identifier as defined in 3GPP TS 23.501 [24], clause 5.9.2 in NAI representation |
| Usage guidance | In 3GPP Release 15 a SUPI may contain either an IMSI or an NAI, as defined in 3GPP TS 23.501 [24]. This representation is used for a SUPI in NAI format |
| References | 3GPP TS 23.501 [24] IETF RFC 7542 [26] |
| Example | |
| Regular expression | See definition of NAI |
| XSD | |
| ASN.1 | |

6.41 SUCI

| | |
|---------------------------|--|
| Name | SUCI |
| Description | Subscription Concealed Identifier as defined in 3GPP TS 33.501 [25], clause 6.12.2 |
| Usage guidance | The structure of a SUCI is given in 3GPP TS 23.003 [6], clause 2.2B, and the IE encoding format is given in 3GPP TS 24.501 [27]. When the ASN.1 representation is used, the octets of the SUCI are provided as defined in 3GPP TS 24.501 [27], clause 9.11.3.4, with the 5GS Mobile identity IEI and length fields (i.e. octets 1, 2 and 3 in figure 9.11.3.4.3) omitted. When XSD or string representations are used, the same octets are provided but in hex-binary representation |
| References | 3GPP TS 33.501 [25] 3GPP TS 24.501 [27] |
| Example | - |
| Regular expression | [0-9a-f]+ |
| XSD | SUCI, simpleType |
| ASN.1 | SUCI, OCTET STRING |

6.42 PEIIMEI

| | |
|---------------------------|---|
| Name | PEIIMEI |
| Description | Permanent Equipment Identifier as defined in 3GPP TS 23.501 [24], clause 5.9.3 in IMEI representation, without the final check/spare digit |
| Usage guidance | In 3GPP Release 15 a PEI may contain either an IMEI or an IMEISV as defined in 3GPP TS 23.501 [24]. This representation is used for IMEI format without the final check/spare digit |
| References | 3GPP TS 23.501 [24], clause 5.9.3 3GPP TS 23.003 [6], clause 6.2.1 |
| Example | |
| Regular expression | See definition of IMEI |
| XSD | |
| ASN.1 | |

6.43 PEIIMEICheckDigit

| | |
|---------------------------|--|
| Name | PEIIMEICheckDigit |
| Description | Permanent Equipment Identifier as defined in 3GPP TS 23.501 [24], clause 5.9.3 in IMEI representation with Luhn check digit |
| Usage guidance | In 3GPP Release 15 a PEI may contain either an IMEI or an IMEISV as defined in 3GPP TS 23.501 [24]. This representation is used for IMEI format including the Luhn check digit |
| References | 3GPP TS 23.501 [24], clause 5.9.3 3GPP TS 23.003 [6], clause 6.2.1 |
| Example | |
| Regular expression | See definition of IMEICheckDigit |
| XSD | |
| ASN.1 | |

6.44 PEIIMEISV

| | |
|---------------------------|---|
| Name | PEIIMEISV |
| Description | Permanent Equipment Identifier as defined in 3GPP TS 23.501 [24], clause 5.9.3 in IMEISV representation |
| Usage guidance | In 3GPP Release 15 a PEI may contain either an IMEI or an IMEISV as defined in 3GPP TS 23.501 [24]. This representation is used for IMEISV format written as decimal digits including a software version number instead of a Luhn check digit |
| References | 3GPP TS 23.501 [24] 3GPP TS 23.003 [6], clause 6.2.2 |
| Example | See definition of IMEISV |
| Regular expression | |
| XSD | |
| ASN.1 | |

6.45 GPSIMSISDN

| | |
|---------------------------|--|
| Name | GPSIMSISDN |
| Description | Generic Public Subscription Identifier as defined in 3GPP TS 23.501 [24], clause 5.9.8 in MSISDN representation (see 3GPP TS 23.003 [6], clause 3.2) |
| Usage guidance | In 3GPP Release 15 a GPSI may contain either a MSISDN, or an External Identifier given as an NAI following the rules given in 3GPP TS 23.003 [6], clause 19.7.2. This representation is used for MSISDN following the format given in 3GPP TS 23.003 [6], clause 3.2 |
| References | 3GPP TS 23.501 [24] 3GPP TS 23.003 [6] |
| Example | 447700900000 |
| Regular expression | [0-9]{1,15} |
| XSD | simpleType |
| ASN.1 | NumericString (SIZE(1..15)) |

6.46 GPSINAI

| | |
|---------------------------|---|
| Name | GPSINAI |
| Description | Generic Public Subscription Identifier as defined in 3GPP TS 23.501 [24], clause 5.9.8 in NAI representation |
| Usage guidance | In 3GPP Release 15 a GPSI may contain either a MSISDN, or an External Identifier given as an NAI following the rules given in 3GPP TS 23.003 [6], clause 19.7.2. This representation is used for NAI format |
| References | 3GPP TS 23.501 [24] IETF RFC 7542 [26] |
| Example | See definition of NAI |
| Regular expression | |
| XSD | |
| ASN.1 | |

6.47 NAI

| | |
|---------------------------|--|
| Name | NAI |
| Description | Network Access Identifier following the format given in IETF RFC 7542 [26] |
| Usage guidance | In general an NAI will take the form "username@realm" |
| References | IETF RFC 7542 [26] |
| Example | user@homerealm.example.net |
| Regular expression | - |
| XSD | NAI, simpleType |
| ASN.1 | NAI, UTF8String |

6.48 LDID

| | |
|---------------------------|---|
| Name | LDID |
| Description | For each Lawful Disclosure request, the LEA shall assign a unique Lawful Disclosure Identifier. A CSP can then use this identifier to uniquely identify a request and when sending a response, include this identifier for correlation on the LEA side. The structure of the LDID is compatible with RequestID parameter as defined in ETSI TS 102 657 [7]. It is defined as a "-"-separated string that contains: <ol style="list-style-type: none"> 1. A two letter country code as per ISO 3166-1 [18] 2. A unique identifier that identifies the LEA 3. A request identifier that is unique within the scope of country code and LEA identifier |
| Usage guidance | - |
| References | ETSI TS 103 120 [28], clause 8.3 |
| Example | NL-03112345-123 |
| Regular expression | [A-Z]{2}-.+-.+ |
| XSD | LDID, simpleType |
| ASN.1 | - |

6.49 InternationalizedEmailAddress

| | |
|---------------------------|---|
| Name | InternationalizedEmailAddress |
| Description | Internationalized E-mail address |
| Usage guidance | - |
| References | IETF RFC 6530 [30]. |
| Example | Όνομα.παράδειγματος@example.com |
| Regular expression | .+@.+ |
| XSD | InternationalizedEmailAddress, simpleType |
| ASN.1 | Not defined |

6.50 EUI64

| | |
|---------------------------|---|
| Name | EUI64 |
| Description | EUI64 written as eight groups of two hexadecimal digits separated by a colon |
| Usage guidance | Colons are being used as separators instead of dashes as used in IETF RFC 7042 [31]. Also, lowercase is used in the expression instead of uppercase |
| References | IEEE 802.3 [14], IETF RFC 7042 [31] |
| Example | 02:00:5e:10:00:00:00:00 |
| Regular expression | ([a-f0-9]{2}:){7}[a-f0-9]{2} |
| XSD | EUI64, simpleType |
| ASN.1 | Not defined |

6.51 CGI

| | |
|---------------------------|--|
| Name | CGI |
| Description | Cell Global Identification |
| Usage guidance | MCC (3 digits), MNC (2-3 digits), LAC (16 bits, hex) and CI (16 bits, hex), separated by "-" |
| References | 3GPP TS 29.571 [33], clauses 5.4.2 and 5.4.4.54 |
| Example | 001-01-12ab-34de |
| Regular expression | [0-9]{3}-[0-9]{2,3}-[a-f0-9]{4}-[a-f0-9]{4} |
| XSD | CGI |
| ASN.1 | Not defined |

6.52 ECGI

| | |
|---------------------------|--|
| Name | ECGI |
| Description | E-UTRAN Cell Global Identification |
| Usage guidance | MCC (3 digits), MNC (2-3 digits), ECI (28 bits, hex), separated by "-" |
| References | 3GPP TS 29.571 [33], clauses 5.4.2 and 5.4.4.5 |
| Example | 001-01-5db6007 |
| Regular expression | [0-9]{3}-[0-9]{2,3}-[a-f0-9]{7} |
| XSD | ECGI |
| ASN.1 | Not defined |

6.53 NCGI

| | |
|---------------------------|--|
| Name | NCGI |
| Description | NR Cell Global Identifier |
| Usage guidance | MCC (3 digits), MNC (2-3 digits), NCI (36 bits, hex), separated by "-" |
| References | 3GPP TS 29.571 [33], clauses 5.4.2 and 5.4.4.6 |
| Example | 001-01-225db6007 |
| Regular expression | [0-9]{3}-[0-9]{2,3}-[a-f0-9]{9} |
| XSD | NCGI |
| ASN.1 | Not defined |

6.54 ICCID

| | |
|---------------------------|------------------------------------|
| Name | ICCID |
| Description | Integrated circuit card identifier |
| Usage guidance | 19 or 20 digits |
| References | ETSI TS 102 221 [32] |
| Example | - |
| Regular expression | [0-9]{19,20} |
| XSD | ICCID |
| ASN.1 | Not defined |

6.55 IPProtocol

| | |
|---------------------------|--|
| Name | IPProtocol |
| Description | Assigned Internet Protocol Number |
| Usage guidance | 0 to 255 |
| References | IANA "Assigned Internet Protocol Numbers" [34] |
| Example | 6 |
| Regular expression | [01]?[0-9]?[0-9] 2[0-4][0-9] 25[0-5] |
| XSD | IPProtocol, simpleType |
| ASN.1 | IPProtocol, INTEGER (0..255) |

6.56 VLANID

| | |
|---------------------------|---|
| Name | VLANID |
| Description | VLAN ID, written in decimal notation |
| Usage guidance | - |
| References | IEEE 802.1Q-2014 [37] |
| Example | 22 |
| Regular expression | [0-9] [0-9]{2} [0-3]?[0-9]{3} 40[0-8][0-9] 409[0-5] |
| XSD | VLANID, simpleType |
| ASN.1 | VLANID, INTEGER (0..4095) |

7 Technical implementation

7.1 XSD

The XSD definition is defined in annex A. The XSD file named "TS_103_280_v021001.xsd" is contained in archive ts_103280v021101p0.zip which accompanies the present document.

The targetNamespace of the XSD is set to 'http://uri.etsi.org/03280/common/2017/07'. The XSD version is set to 2.10.1.

The targetNamespace shall be increased in the event of a major release as defined in clause 4 and the requirement to do so. The year in the targetNamespace shall be set to the year and month of publication of the major release.

The XSD version shall be increased according to the versioning scheme as defined in clause 4. A change to the present document shall not necessarily lead to a new XSD version. The XSD version shall only be increased when a change to the XSD is required, as such the version of the present document and the XSD version may differ.

As the XSD version is not part of the targetNamespace, an implementation should take into account that the appropriate version is used when importing the XSD.

7.2 ASN.1

The ASN.1 definition is defined in annex B. The ASN.1 file named "TS_103_280_v020501.asn1" is contained in archive ts_103280v021101p0.zip which accompanies the present document.

The ASN.1 object identifier is defined as itu-t(0) identified-organization(4) etsi(0) common-parameters(3280) version251(251).

The ASN.1 version shall be increased according to the versioning scheme as defined in clause 4. A change to the present document shall not necessarily lead to a new ASN.1 version. The ASN.1 version shall only be increased when a change to the ASN.1 is required, as such the version of the present document and the ASN.1 version may differ.

7.3 JSON

The JSON Schema definition named "TS_103_280_v021101.schema.json" is contained in archive ts_103280v021101p0.zip which accompanies the present document.

Unless otherwise specified, each definition in the JSON Schema shall be the result of transforming the equivalent definition in the XSD schema (see clause 7.1 and annex A) according to the translation rules given in annex C. In the event of a discrepancy then each schema shall be considered authoritative with respect to its relevant encoding.

Annex A (normative): XSD definition

```

<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns="http://uri.etsi.org/03280/common/2017/07"
targetNamespace="http://uri.etsi.org/03280/common/2017/07" version="2.11.1"
elementFormDefault="qualified">
  <xs:simpleType name="ShortString">
    <xs:restriction base="xs:string">
      <xs:maxLength value="255"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="LongString">
    <xs:restriction base="xs:string">
      <xs:maxLength value="65535"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="LIID">
    <xs:restriction base="xs:normalizedString">
      <xs:pattern value="([!~]{1,25})|([0-9a-f]{26,50})"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="UTCDateTime">
    <xs:restriction base="xs:dateTime">
      <xs:pattern value="[0-9]{4}-[0-9]{2}-[0-9]{2}T[0-9]{2}:[0-9]{2}:[0-9]{2}Z"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="UTCMicrosecondDateTime">
    <xs:restriction base="xs:dateTime">
      <xs:pattern value="[0-9]{4}-[0-9]{2}-[0-9]{2}T[0-9]{2}:[0-9]{2}:[0-9]{2}\.[0-9]{6}Z"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="QualifiedDateTime">
    <xs:restriction base="xs:dateTime">
      <xs:pattern value="[0-9]{4}-[0-9]{2}-[0-9]{2}T[0-9]{2}:[0-9]{2}:[0-9]{2}(Z|[-+][0-9]{2}:[0-9]{2})"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="QualifiedMicrosecondDateTime">
    <xs:restriction base="xs:dateTime">
      <xs:pattern value="[0-9]{4}-[0-9]{2}-[0-9]{2}T[0-9]{2}:[0-9]{2}:[0-9]{2}\.[0-9]{6}(Z|[-+][0-9]{2}:[0-9]{2})"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="InternationalE164">
    <xs:restriction base="xs:token">
      <xs:pattern value="[0-9]{1,15}"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="IMSI">
    <xs:restriction base="xs:token">
      <xs:pattern value="[0-9]{6,15}"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="IMEI">
    <xs:restriction base="xs:token">
      <xs:pattern value="[0-9]{14}"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="IMEICheckDigit">
    <xs:restriction base="xs:token">
      <xs:pattern value="[0-9]{15}"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="IMEISV">
    <xs:restriction base="xs:token">
      <xs:pattern value="[0-9]{16}"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="IPv4Address">
    <xs:restriction base="xs:token">
      <xs:pattern value="((25[0-5]|2[0-4][0-9]|[01]?[0-9]?[0-9])\.){3}(25[0-5]|2[0-4][0-9]|[01]?[01]?[0-9]?[0-9])"/>
    </xs:restriction>
  </xs:simpleType>

```

```

</xs:simpleType>
<xs:simpleType name="IPv4CIDR">
  <xs:restriction base="xs:token">
    <xs:pattern value="((25[0-5]|2[0-4][0-9]|[01]?[0-9]?[0-9])\.){3}(25[0-5]|2[0-4][0-9]|[01]?[0-9]?[0-9])/([1-2]?[0-9]|3[0-2])"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="IPv6Address">
  <xs:restriction base="xs:token">
    <xs:pattern value="([0-9a-f]{4}:){7}([0-9a-f]{4})"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="IPv6CIDR">
  <xs:restriction base="xs:token">
    <xs:pattern value="([0-9a-f]{4}:){7}([0-9a-f]{4})/(((1-9)[0-9]?)|(1[0-1][0-9])|(12[0-8]))"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="IPAddress">
  <xs:choice>
    <xs:element name="IPv4Address" type="IPv4Address"/>
    <xs:element name="IPv6Address" type="IPv6Address"/>
  </xs:choice>
</xs:complexType>
<xs:complexType name="IPCIDR">
  <xs:choice>
    <xs:element name="IPv4CIDR" type="IPv4CIDR"/>
    <xs:element name="IPv6CIDR" type="IPv6CIDR"/>
  </xs:choice>
</xs:complexType>
<xs:simpleType name="TCPPort">
  <xs:restriction base="xs:integer">
    <xs:minExclusive value="1"/>
    <xs:maxInclusive value="65535"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="TCPPortRange">
  <xs:sequence>
    <xs:element name="start" type="TCPPort"/>
    <xs:element name="end" type="TCPPort"/>
  </xs:sequence>
</xs:complexType>
<xs:simpleType name="UDPPort">
  <xs:restriction base="xs:integer">
    <xs:minInclusive value="0"/>
    <xs:maxInclusive value="65535"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="UDPPortRange">
  <xs:sequence>
    <xs:element name="start" type="UDPPort"/>
    <xs:element name="end" type="UDPPort"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="Port">
  <xs:choice>
    <xs:element name="TCPPort" type="TCPPort"/>
    <xs:element name="UDPPort" type="UDPPort"/>
  </xs:choice>
</xs:complexType>
<xs:complexType name="PortRange">
  <xs:choice>
    <xs:element name="TCPPortRange" type="TCPPortRange"/>
    <xs:element name="UDPPortRange" type="UDPPortRange"/>
  </xs:choice>
</xs:complexType>
<xs:complexType name="IPAddressPort">
  <xs:sequence>
    <xs:element name="address" type="IPAddress"/>
    <xs:element name="port" type="Port"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="IPAddressPortRange">
  <xs:sequence>
    <xs:element name="address" type="IPAddress"/>
    <xs:element name="portRange" type="PortRange"/>
  </xs:sequence>
</xs:complexType>

```

```

<xs:simpleType name="MACAddress">
  <xs:restriction base="xs:token">
    <xs:pattern value="([a-f0-9]{2}:){5}[a-f0-9]{2}"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="EmailAddress">
  <xs:restriction base="ShortString">
    <xs:pattern value="[a-zA-Z0-9\.\!#\$\%&'\*\+\|\/=\\?\^_\`{\|\}\~\-\]\+@[a-zA-Z0-9-]{0,61}[a-zA-Z0-9]?(\.[a-zA-Z0-9-]{0,61}[a-zA-Z0-9])?*" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="UUID">
  <xs:restriction base="xs:token">
    <xs:pattern value="[a-f0-9]{8}-[a-f0-9]{4}-[a-f0-9]{4}-[a-f0-9]{4}-[a-f0-9]{12}"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="ISOCountryCode">
  <xs:restriction base="xs:token">
    <xs:pattern value="[A-Z]{2}"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="SIPURI">
  <xs:restriction base="xs:anyURI">
    <xs:pattern value="sips?:[a-zA-Z0-9!#\$\%&';-:;=?-\[\]\_~%]+"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="TELURI">
  <xs:restriction base="xs:anyURI">
    <xs:pattern value="tel:[a-zA-Z0-9!#\$\%&';-:;=?-\[\]\_~%]+"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="WGS84CoordinateDecimal">
  <xs:sequence>
    <xs:element name="latitude" type="WGS84LatitudeDecimal"/>
    <xs:element name="longitude" type="WGS84LongitudeDecimal"/>
  </xs:sequence>
</xs:complexType>
<xs:simpleType name="WGS84LatitudeDecimal">
  <xs:restriction base="xs:string">
    <xs:pattern value="[NS][0-9]{2}\.[0-9]{6}"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="WGS84LongitudeDecimal">
  <xs:restriction base="xs:string">
    <xs:pattern value="[EW][0-9]{3}\.[0-9]{6}"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="WGS84CoordinateAngular">
  <xs:sequence>
    <xs:element name="latitude" type="WGS84LatitudeAngular"/>
    <xs:element name="longitude" type="WGS84LongitudeAngular"/>
  </xs:sequence>
</xs:complexType>
<xs:simpleType name="WGS84LatitudeAngular">
  <xs:restriction base="xs:string">
    <xs:pattern value="[NS][0-9]{6}\.[0-9]{2}"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="WGS84LongitudeAngular">
  <xs:restriction base="xs:string">
    <xs:pattern value="[EW][0-9]{7}\.[0-9]{2}"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="SUPIIMSI">
  <xs:restriction base="IMSI"/>
</xs:simpleType>
<xs:simpleType name="SUPINAI">
  <xs:restriction base="NAI"/>
</xs:simpleType>
<xs:simpleType name="SUCI">
  <xs:restriction base="xs:hexBinary"/>
</xs:simpleType>
<xs:simpleType name="PEIIMEI">
  <xs:restriction base="IMEI"/>
</xs:simpleType>
<xs:simpleType name="PEIIMEICheckDigit">
  <xs:restriction base="IMEICheckDigit"/>
</xs:simpleType>

```

```

<xs:simpleType name="PEIIMEISV">
  <xs:restriction base="IMEISV" />
</xs:simpleType>
<xs:simpleType name="GPSIMSISDN">
  <xs:restriction base="xs:token">
    <xs:pattern value="[0-9]{1,15}" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="GPSINAI">
  <xs:restriction base="NAI" />
</xs:simpleType>
<xs:simpleType name="NAI">
  <xs:restriction base="xs:string" />
</xs:simpleType>
<xs:simpleType name="LDID">
  <xs:restriction base="xs:string">
    <xs:pattern value="([A-Z]{2}-.+-.+)" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="InternationalizedEmailAddress">
  <xs:restriction base="ShortString">
    <xs:pattern value=".+@.+" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="EUI64">
  <xs:restriction base="xs:token">
    <xs:pattern value="([a-f0-9]{2}:){7}[a-f0-9]{2}" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="CGI">
  <xs:restriction base="xs:token">
    <xs:pattern value="[0-9]{3}-[0-9]{2,3}-[a-f0-9]{4}-[a-f0-9]{4}" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="ECGI">
  <xs:restriction base="xs:token">
    <xs:pattern value="[0-9]{3}-[0-9]{2,3}-[a-f0-9]{7}" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="NCGI">
  <xs:restriction base="xs:token">
    <xs:pattern value="[0-9]{3}-[0-9]{2,3}-[a-f0-9]{9}" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="ICCID">
  <xs:restriction base="xs:token">
    <xs:pattern value="[0-9]{19,20}" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="IPProtocol">
  <xs:restriction base="xs:integer">
    <xs:minInclusive value="0" />
    <xs:maxInclusive value="255" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="VLANID">
  <xs:restriction base="xs:integer">
    <xs:minInclusive value="0" />
    <xs:maxInclusive value="4095" />
  </xs:restriction>
</xs:simpleType>
</xs:schema>

```

Annex B (normative): ASN.1 definition

```

Common-Parameters
{itu-t(0) identified-organization(4) etsi(0) common-parameters(3280) version251(251)}

DEFINITIONS IMPLICIT TAGS EXTENSIBILITY IMPLIED ::= BEGIN

-- Object Identifier definitions

commonParameterDomainId OBJECT IDENTIFIER ::= {itu-t(0) identified-organization(4) etsi(0) common-
parameters(3280) version251(251)}

-- Common Parameters (below are as defined in clause 6)

LIID ::= OCTET STRING (SIZE (1..25))

TCPPort ::= INTEGER (1..65535)

TCPPortRange ::= SEQUENCE
{
    start [0] TCPPort,
    end [1] TCPPort
}

UDPPort ::= INTEGER (0..65535)

UDPPortRange ::= SEQUENCE
{
    start [0] UDPPort,
    end [1] UDPPort
}

Port ::= CHOICE
{
    tCPPort [0] TCPPort,
    uDPPort [1] UDPPort
}

PortRange ::= CHOICE
{
    tCPPortRange [0] TCPPortRange,
    uDPPortRange [1] UDPPortRange
}

QualifiedDateTime ::= GeneralizedTime

QualifiedMicrosecondDateTime ::= GeneralizedTime

WGS84CoordinateDecimal ::= SEQUENCE
{
    latitude [0] WGS84LatitudeDecimal,
    longitude [1] WGS84LongitudeDecimal
}

WGS84LatitudeDecimal ::= OCTET STRING (SIZE (10))

WGS84LongitudeDecimal ::= OCTET STRING (SIZE (11))

WGS84CoordinateAngular ::= SEQUENCE
{
    latitude [0] WGS84LatitudeAngular,
    longitude [1] WGS84LongitudeAngular
}

WGS84LatitudeAngular ::= OCTET STRING (SIZE (10))

WGS84LongitudeAngular ::= OCTET STRING (SIZE (11))

InternationalE164 ::= NumericString (SIZE(1..15))

IMSI ::= NumericString (SIZE(6..15))

IMEI ::= NumericString (SIZE(14))

```



```
IMEICheckDigit ::= NumericString (SIZE(15))
IMEISV ::= NumericString (SIZE(16))
SUPIIMSI ::= IMSI
SUPINAI ::= NAI
SUCI ::= OCTET STRING
PEIIMEI ::= IMEI
PEIIMEICheckDigit ::= IMEICheckDigit
PEIIMEISV ::= IMEISV
GPSIMSISDN ::= NumericString (SIZE(1..15))
GPSINAI ::= NAI
NAI ::= UTF8String
IPProtocol ::= INTEGER (0..255)
VLANID ::= INTEGER (0..4095)
END
```

Annex C (informative): XSD to JSON schema translation

C.1 Overview

This annex gives a translation for converting XSD schema definitions to JSON Schema definitions [35].

C.2 General translation rules

For specifications which have multiple XSD schemas, each XSD schema is translated into a JSON Schema using the procedures given in this annex.

The ID of a translated JSON Schema is mapped from the relevant XSD namespace. The precise mapping is set by the relevant specification.

C.3 Translation of simple types

C.3.1 Translation rules

If the simple type is a restriction of an XSD native type, then the translation in clause C.3.2 applies.

If the simple type is a restriction of any other simple type, then the translation in clause C.3.3 applies.

C.3.2 Restrictions of XSD native simple types

XSD native simple types are mapped according to table C.1.

Table C.1: Mapping of XSD native simple types

| XSD type | JSON Schema definition |
|--------------------|---|
| string | {"type": "string"} |
| normalizedString | {"type": "string"} |
| dateTime | {"type": "string"} |
| Token | {"type": "string"} |
| anyURI | {"type": "string"} |
| Integer | {"type": "integer"} |
| nonNegativeInteger | {"type": "integer", "minimum": 0} |
| positiveInteger | {"type": "integer", "minimum": 1} |
| Boolean | {"type": "boolean" } |
| hexBinary | {"type": "string", "pattern": "^([a-fA-F0-9]{2})*\$"} |
| base64Binary | {"type": "string", "pattern": "^[A-Za-z0-9+\\/=]{0,3}\$"} |
| anyType | {} |

If the simple type is a restriction of an XSD native simple type not described in table C.1, the mapping is undefined.

If the simple type has additional facets, they are mapped according to table C.2.

Table C.2: Mapping of facets

| XSD facet | JSON Schema definition |
|--|---|
| <xs:pattern value="{pattern}"/> | "pattern" : "^{pattern}\$" See NOTE. |
| <xs:maxLength="{length}"/> | "maxLength" : {length} |
| <xs:minLength="{length}"/> | "minLength" : {length} |
| <xs:minInclusive="{value}"/> | "minimum" : {value} |
| <xs:minExclusive="{value}"/> | "exclusiveMinimum" : {value} |
| <xs:maxInclusive="{value}"/> | "maximum" : {value} |
| <xs:maxExclusive="{value}"/> | "exclusiveMaximum" : {value} |
| NOTE: The JSON Schema requires the "^" and "\$" anchors. | |

If the simple type has additional facets not described in table C.2, the mapping is undefined.

C.3.3 Restrictions of other simple types

If the simple type has no additional facets on the base simple type, then the JSON definition is a direct reference to the base simple type.

If the simple type has additional facets, then the JSON Schema definition is an "allOf" union of the following:

- A reference to the base simple type.
- A JSON Schema definition obtained by the mapping of the root XSD native type according to table C.1 and the mapping of each facet according to table C.2.

C.4 Translation of complex types

C.4.1 Translation rules

If the complex type is a sequence, then the rules in clause C.4.2 apply.

If the complex type is a choice, then the rules in clause C.4.3 apply.

C.4.2 Translation of sequences

The "type" field of the JSON Schema definition is set to "object".

The "properties" dictionary of the JSON definition contains an entry for each element in the XSD sequence. For each entry, the key is set to the name of the element in the XSD sequence.

The value of that entry is set as follows:

- If the effective maxOccurs fact of the element is greater than 1, the entry is a definition with the "type" field set to "array" and the "items" field set to the appropriate definition (see below). In this case:
 - If the effective maxOccurs value of the element not "unbounded", that value is used to set the "maxItems" field of the definition.
 - If the effective minOccurs value of the element is greater than zero, that value is used to set the "minItems" field of the definition.
- Otherwise, the entry is set to the appropriate definition. If the effective minOccurs value of the element is 1, then the key is added to the "required" list of the JSON Schema definition.

- The appropriate definition is defined as follows:
 - If the type of the element is an XSD native type described in table C.1, then the appropriate definition is the mapping of that native type as described in table C.1.
 - If the type of the element is an XSD native type not described in table C.1, then the appropriate definition is undefined.
 - Otherwise, the the appropriate definition is a reference to the JSON Schema definition created by the mapping of the referenced XSD type.

If the sequence contains an anonymous choice group, then the JSON Schema definition is set to an "allOf" union of the following:

- A JSON Schema definition of the non-choice elements, constructed using the rules above.
- A "one of" alternation containing a list of definitions obtained from mapping the inner choice elements according to clause C.4.3.

If the sequence contains more than one anonymous choice group, or if the anonymous choice group is not the last element in the sequence, then the mapping is undefined.

If the sequence contains anything other than elements and at most one anonymous choice group, the mapping of the complex type is undefined.

If the complex type is itself an extension of another complex type, then the "parameters" dictionary includes mappings of the elements in both that complex type and all ancestor types. The "parameters" dictionary also contains an additional entry with a key of "@xsi:type" and a definition as given in table C.3.

Table C.3: Additional @xsi:type property

| Field | Value |
|-------|--|
| type | String |
| enum | The fully-qualified name of the XSD type referenced in the xsi:type attribute of the complexType definition. |

C.4.3 Translation of choices

The definition consists of a "oneOf" alternation containing one entry for each choice in the original complexType.

The entry for each element consists of a JSON Schema definition constructed as follows:

- The "type" field is set to "object".
- The "properties" dictionary shall consist of a single key-value pair. The key is set to the name of the element. The value is set to the appropriate definition following the same rules for sequence elements (see clause C.4.2).
- The "required" list consists of a single entry, set to the value of the single key in the "properties" dictionary.
- If the choice contains anything other than elements, the mapping is undefined.

Annex D (informative): Change Request history

| Status of the present document Dictionary for common parameters | | |
|--|---------|--|
| TC LI approval date | Version | Remarks |
| June 2015 | 1.1.1 | First publication of the TS after approval by ETSI TC LI#39 |
| August 2016 | 1.1.2 | Revision for a minor editorial correction |
| January 2017 | 1.2.1 | Included Change Requests agreed by LI#42: CR001r1, LI(16)P42024r1 (Cat D) Addition of XSD annex to ETSI TS 103 280 CR002r1, LI(16)P420r1 (Cat B) ASN.1 definitions in ETSI TS 103 280 |
| June 2017 | 2.1.1 | Included Change Requests: CR003r1 (agreed by LI#43), LI(16)P43009r1 (Cat F) Short IMSI CR005 (agreed by LI#45), LI(17)P45025 (Cat B) Addition of SIP URI and TEL URI to common definitions CR006r1 (agreed by LI#45), LI(17)P45026r1 (Cat B) Addition of ASN.1 definitions to ETSI TS 103 280 |
| June 2018 | 2.2.1 | Included Change Requests: CR007r3 (agreed by LI#48), LI(18)P48008r3 (Cat B) Clarification to UTC time parameters and addition of WGS84 Location Parameters CR008 (agreed by LI#48), LI(18)P48020 (Cat D) Correction of the Regular Expression contained in the Definition of EmailAddress |
| March 2019 | 2.3.1 | Included Change Requests: CR009r3 (agreed by LI#50), LI(19)P50011r3 (Cat B) Addition of 5G identifiers to common parameters |
| October 2019 | 2.4.1 | Included Change Requests: CR011 (agreed by LI#52), LI(19)P52024 (Cat D) Additional ASN.1 example for QualifiedDateTime and QualifiedMicrosecondDateTime CR012 (agreed by LI#52), LI(19)P52031r1 (Cat B) Addition of LDID |
| February 2021 | 2.5.1 | Included Change Requests agreed by ETSI TC LI#56e: CR014r1, LI(21)P56012r1 (Cat F) Regex anchors and section headings CR015r3, LI(21)P56022r3 (Cat F) Correction of SUCI user guidance |
| June 2021 | 2.6.1 | Included Change Request agreed by ETSI TC LI#57e: CR016, LI(21)P57015r1 (Cat B) Addition of InternationalizedEmailAddress type |
| November 2021 | 2.7.1 | Included Change Requests agreed by ETSI TC LI#58e: CR017, LI(21)P58035r1 (Cat F) Better examples CR018, LI(21)P58024r3 (Cat B) Addition of EUI64 |
| February 2022 | 2.8.1 | Included Change Request agreed by ETSI TC LI#59e: CR019, LI(22)P59027r2 (Cat B) Addition of CGI, ECGI, NCGI and ICCID |
| November 2022 | 2.9.1 | Included Change Request agreed by ETSI TC LI#61: CR022, LI(22)P61048 (Cat B) Addition of IPProtocol parameter |
| June 2023 | 2.10.1 | Included Change Request agreed by ETSI TC LI#63: CR023, LI(23)P63033r2 (Cat B) JSON encoding |
| December 2023 | 2.11.1 | Included Change Requests agreed by ETSI TC LI#64: CR024, LI(23)P64016r1 (Cat C) Regular expression clarifications and editorial fixes CR025, LI(23)P64017r5 (Cat B) Add VLAN types |

History

| Document history | | |
|-------------------------|----------------|-------------|
| V1.1.1 | August 2015 | Publication |
| V1.1.2 | August 2015 | Publication |
| V1.2.1 | August 2016 | Publication |
| V2.1.1 | August 2017 | Publication |
| V2.2.1 | September 2018 | Publication |
| V2.3.1 | April 2019 | Publication |
| V2.4.1 | December 2019 | Publication |
| V2.5.1 | March 2021 | Publication |
| V2.6.1 | July 2021 | Publication |
| V2.7.1 | November 2021 | Publication |
| V2.8.1 | April 2022 | Publication |
| V2.9.1 | December 2022 | Publication |
| V2.10.1 | August 2023 | Publication |
| V2.11.1 | January 2024 | Publication |