ETSI TS 124 391 V17.0.0 (2022-05)

TECHNICAL SPECIFICATION

Universal Mobile Telecommunications System (UMTS);
LTE;
5G;
Unstructured Supplementary Service Data (USSD)
using IP Multimedia (IM) Core Network (CN) subsystem (IMS)
Management Object (MO)
(3GPP TS 24.391 version 17.0.0 Release 17)

Reference

RTS/TSGC-0124391vh00

Keywords

5G,LTE,UMTS

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:
http://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/CommiteeSupportStaff.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

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.

Legal Notice

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

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.

Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

1   Scope

The present document defines the unstructured supplementary service data (USSD) using IP Multimedia (IM) Core Network (CN) subsystem (IMS) management object (MO). The MO is compatible with OMA device management protocol specifications, version 1.2 and upwards, and is defined using the OMA DM device description framework as described in the enabler release definition OMA-ERELD_DM-V1_2 [2].

The USSD using IMS (USSI) MO consists of relevant configuration parameters that can be managed for the UE's USSI capabilities specified in 3GPP TS 24.390 [3].

2   References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2]   OMA-ERELD-DM-V1_2-20070209-A: "Enabler Release Definition for OMA Device Management, Version 1.2".

[3]   3GPP TS 24.390: "Unstructured Supplementary Service Data (USSD) using IP Multimedia (IM) Core Network (CN) subsystem IMS; Stage 3".

[4]   3GPP TS 23.221: "Architectural requirements".

[5]   3GPP TS 24.090: "Unstructured Supplementary Service Data (USSD); Stage 3".

[6]   3GPP TS 23.003: "Numbering, addressing and identification".

3   Definitions, symbols and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

3.2   Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

CN	Core Network
DDF	Device Description Framework
DM	Device Management
EHPLMN	Equivalent Home Public Land Mobile Network
HPLMN	Home Public Land Mobile Network

IM   IP Multimedia
IMS   IP Multimedia core network Subsystem
IP   Internet Protocol
MO   Management Object
OMA   Open Mobile Alliance
SIP   Session Initiation Protocol
SNPN   Stand-alone Non-Public Network
UE   User Equipment
USSD   Unstructured Supplementary Service Data
USSI   USSD using IMS

4 USSI MO

The USSI MO is used to manage settings of the UE for USSI. The USSI MO covers configuration parameters for a UE that supports the USSI capabilities specified in 3GPP TS 24.390 [3].

The MO identifier is: urn:oma:mo:ext-3gpp-ussi:1.0.

Protocol compatibility: This MO is compatible with OMA DM 1.2.
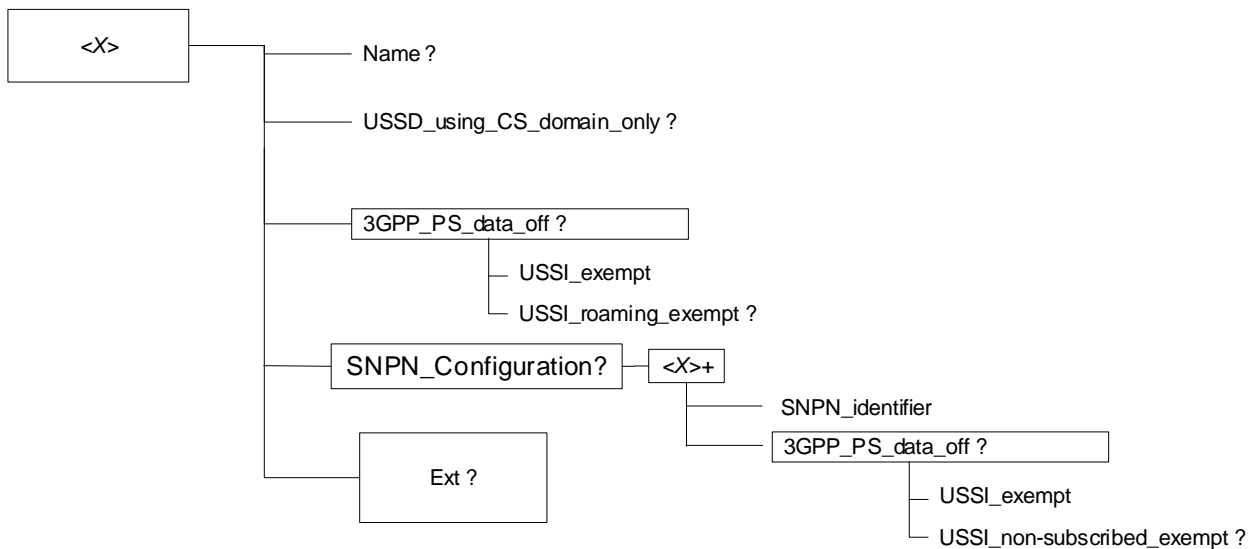
Figure 4.1: USSI MO

5 MO configuration parameters

5.1 General

This clause describes the configuration parameters for the USSI MO.

5.2 Node: /*<X>*

This interior node acts as a placeholder for one or more accounts for a fixed node.

- Occurrence: OneOrMore

- Format: node

- Access Types: Get

- Values: N/A

The interior node is mandatory if the UE supports USSI capabilities specified in 3GPP TS 24.390 [3]. Support for a UE is defined by the UE role as specified in 3GPP TS 24.390 [3].

NOTE: One node is normally used. More nodes are only used in case the terminal supports multiple UICCs.

5.3 /<*X*>/Name

The Name leaf is a name for the USSI settings.

- Occurrence: ZeroOrOne

- Format: chr

- Access Types: Get

- Values: <User displayable name>

5.4 /<*X*>/USSD_using_CS_domain_only

The USSD_using_CS_domain_only leaf indicates HPLMN operator preference for invocation of originating USSD requests using the mechanism specified in 3GPP TS 24.090 [5]. This equates to "USSD requests are to be invoked via the CS domain" as described in 3GPP TS 23.221 [4].

NOTE: In absence of this configuration parameter, originating USSD request are invoked in domain used for originating voice sessions as described in 3GPP TS 23.221 [4].

- Occurrence: ZeroOrOne

- Format: null

- Access Types: Get, Replace

- Values: null

5.4A /<*X*>/3GPP_PS_data_off

The interior node contains configuration parameters for 3GPP PS data off.

- Occurrence: ZeroOrOne

- Format: node

- Access Types: Get, Replace

- Values: N/A

5.4B /<*X*>/3GPP_PS_data_off/USSI_exempt

The leaf indicates whether the USSI is a 3GPP PS data off exempt service.

- Occurrence: One

- Format: bool

- Access Types: Get, Replace

- Values: 0, 1

    0 - Indicates that the USSI is not a 3GPP PS data off exempt service.

    1 - Indicates that the USSI is a 3GPP PS data off exempt service.

NOTE: This MO is used when the UE is in the HPLMN or the EHPLMN, or the UE is in the VPLMN and the USSI_roaming_exempt node is not configured.

5.4C   /<*X*>/3GPP_PS_data_off/USSI_roaming_exempt

The leaf indicates whether the USSI is a 3GPP PS data off exempt service when the UE is in the VPLMN.

- Occurrence: ZeroOrOne

- Format: bool

- Access Types: Get, Replace

- Values: 0, 1

    0 - Indicates that the USSI is not a 3GPP PS data off roaming exempt service.

    1 - Indicates that the USSI is a 3GPP PS data off roaming exempt service.

5.4D   /<*X*>/SNPN_Configuration

This interior node contains configuration parameters regarding a UE operating in SNPN access operation mode.

- Occurrence: ZeroOrOne

- Format: node

- Access Types: Get, Replace

- Values: N/A

5.4E   /<*X*>/SNPN_Configuration/<X>

This interior node acts as a placeholder for a list of:

- a) SNPN identity; and

- b) configuration parameters.

    NOTE: For each of the elements in the list, a) must be present and at least one parameter of b) needs to appear.

A configuration parameter in an /<X>/SNPN_Configuration/<X> node other than the SNPN_identifier, is applicable when the UE selects an entry of "list of subscriber data":

- a) with the SNPN identity of the subscribed SNPN which is the same as the SNPN identity in the SNPN_identifier leaf.

- Occurrence: OneOrMore

- Format: node

- Access Types: Get, Replace

- Values: N/A

5.4F   /<*X*>/SNPN_Configuration/<X>/SNPN_identifier

This leaf indicates the SNPN identity of the subscribed SNPN for which the list of configuration parameters are applicable.

- Occurrence: One

- Format: chr

- Access Types: Get, Replace

- Values: <PLMN><NID>

The PLMN and NID are in the format defined by 3GPP TS 23.003 [6], with each digit of the MCC and MNC of the PLMN and each digit of the assignment mode and NID value of the NID encoded as an ASCII character.

5.4G /<*X*>/SNPN_Configuration/<*X*>/3GPP_PS_data_off

The interior node contains configuration parameters for 3GPP PS data off.

- Occurrence: ZeroOrOne

- Format: node

- Access Types: Get, Replace

- Values: N/A

5.4H /<*X*>/SNPN_Configuration/<*X*>/3GPP_PS_data_off/ USSI_exempt

The leaf indicates whether the USSI is a 3GPP PS data off exempt service.

- Occurrence: One

- Format: bool

- Access Types: Get, Replace

- Values: 0, 1

  0 - Indicates that the USSI is not a 3GPP PS data off exempt service.

  1 - Indicates that the USSI is a 3GPP PS data off exempt service.

- NOTE: This MO is used when the UE is in the subscribed SNPN, or the UE is in the non-subscribed SNPN and the USSI_non-subscribed_exempt node is not configured.

5.4I /<*X*>/SNPN_Configuration/<*X*>/3GPP_PS_data_off/ USSI_non-subscribed_exempt

The leaf indicates whether the USSI is a 3GPP PS data off exempt service when the UE is in the non-subscribed SNPN.

- Occurrence: ZeroOrOne

- Format: bool

- Access Types: Get, Replace

- Values: 0, 1

  0 - Indicates that the USSI is not a 3GPP PS data off non-subscribed exempt service.

  1 - Indicates that the USSI is a 3GPP PS data off non-subscribed exempt service.

5.5 /<*X*>/Ext

The Ext is an interior node for where the vendor specific information about the USSI management is being placed (vendor meaning application vendor, device vendor etc.). Usually the vendor extension is identified by vendor specific name under the ext node. The tree structure under the vendor identified is not defined and can therefore include one or more un-standardized sub-trees.

- Occurrence: ZeroOrOne

- Format: node

- Access Types: Get

- Values: N/A

Annex A (informative):
USSI MO DDF

This DDF is the standardized minimal set. A vendor can define its own DDF for the complete device. This DDF can include more features than this minimal standardized version.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE MgmtTree PUBLIC "-//OMA//DTD-DM-DDF 1.2//EN"
    "http://www.openmobilealliance.org/tech/DTD/DM_DDF-V1_2.dtd">
<MgmtTree>
    <VerDTD>1.2</VerDTD>
    <Man>--The device manufacturer--</Man>
    <Mod>--The device model--</Mod>
    <Node>
        <NodeName/>
        <DFProperties>
            <AccessType>
                <Get/>
            </AccessType>
            <Description>USSI configuration parameters</Description>
            <DFFormat>
                <node/>
            </DFFormat>
            <Occurrence>
                <OneOrMore/>
            </Occurrence>
            <Scope>
                <Permanent/>
            </Scope>
            <DFTitle>The Unstructured Supplementary Service Data (USSD) using IP Multimedia (IM)
Core Network (CN) subsystem (IMS) Management Object (MO).</DFTitle>
            <DFType>
                <DDFName>urn:oma:mo:ext-3gpp-ussi:1.0</DDFName>
            </DFType>
        </DFProperties>
        <Node>
            <NodeName>Name</NodeName>
            <DFProperties>
                <AccessType>
                    <Get/>
                </AccessType>
                <DFFormat>
                    <chr/>
                </DFFormat>
                <Occurrence>
                    <ZeroOrOne/>
                </Occurrence>
                <Scope>
                    <Dynamic/>
                </Scope>
                <DFTitle>The name for the USSI setting.</DFTitle>
                <DFType>
                    <MIME>text/plain</MIME>
                </DFType>
            </DFProperties>
        </Node>
        <Node>
            <NodeName>USSD_using_CS_domain_only</NodeName>
            <DFProperties>
                <AccessType>
                    <Get/>
                    <Replace/>
                </AccessType>
                <DFFormat>
                    <null/>
                </DFFormat>
                <Occurrence>
                    <ZeroOrOne/>
                </Occurrence>
                <Scope>
                    <Dynamic/>
                </Scope>
                <DFTitle>The HPLMN operator preference for invocation of originating USSD
requests.</DFTitle>
                <DFType>
```

```
                <MIME>text/plain</MIME>
            </DFType>
        </DFProperties>
    </Node>
    <Node>
        <NodeName>3GPP_PS_data_off</NodeName>
        <DFProperties>
            <AccessType>
                <Get/>
                <Replace/>
            </AccessType>
            <DFFormat>
                <node/>
            </DFFormat>
            <Occurrence>
                <ZeroOrOne/>
            </Occurrence>
            <Scope>
                <Dynamic/>
            </Scope>
            <DFTitle>Configuration parameters for 3GPP PS data off.</DFTitle>
            <DFType>
                <DDFName/>
            </DFType>
        </DFProperties>
        <Node>
            <NodeName>USSI_exempt</NodeName>
            <DFProperties>
                <AccessType>
                    <Get/>
                    <Replace/>
                </AccessType>
                <DFFormat>
                    <bool/>
                </DFFormat>
                <Occurrence>
                    <One/>
                </Occurrence>
                <Scope>
                    <Dynamic/>
                </Scope>
                <DFTitle>Whether the USSI is a 3GPP PS data off exempt service.</DFTitle>
                <DFType>
                    <MIME>text/plain</MIME>
                </DFType>
            </DFProperties>
        </Node>
        <Node>
            <NodeName>USSI_roaming_exempt</NodeName>
            <DFProperties>
                <AccessType>
                    <Get/>
                    <Replace/>
                </AccessType>
                <DFFormat>
                    <bool/>
                </DFFormat>
                <Occurrence>
                    <ZeroOrOne/>
                </Occurrence>
                <Scope>
                    <Dynamic/>
                </Scope>
                <DFTitle>Whether the USSI is a 3GPP PS data off roaming exempt
service.</DFTitle>
                <DFType>
                    <MIME>text/plain</MIME>
                </DFType>
            </DFProperties>
        </Node>
    </Node>
    <Node>
        <NodeName>SNPN_Configuration</NodeName>
        <!-- The SNPN_Configuration node starts here. -->
        <DFProperties>
            <AccessType>
                <Get/>
                <Replace/>
```

```
                    </AccessType>
                    <DFFormat>
                        <node/>
                    </DFFormat>
                    <Occurrence>
                        <ZeroOrOne/>
                    </Occurrence>
                    <Scope>
                        <Permanent/>
                    </Scope>
                    <DFTitle>SNPN configuration parameters</DFTitle>
                    <DFType>
                        <DDFName/>
                    </DFType>
            </DFProperties>
            <Node>
                <NodeName/>
                <DFProperties>
                    <AccessType>
                        <Get/>
                    </AccessType>
                    <DFFormat>
                        <node/>
                    </DFFormat>
                    <Occurrence>
                        <OneOrMore/>
                    </Occurrence>
                    <Scope>
                        <Dynamic/>
                    </Scope>
                    <DFTitle>Configuration parameters for an SNPN.</DFTitle>
                    <DFType>
                        <DDFName/>
                    </DFType>
                </DFProperties>
                <Node>
                    <NodeName>SNPN_identifier</NodeName>
                    <DFProperties>
                        <AccessType>
                            <Get/>
                            <Replace/>
                        </AccessType>
                        <DFFormat>
                            <chr/>
                        </DFFormat>
                        <Occurrence>
                            <One/>
                        </Occurrence>
                        <Scope>
                            <Permanent/>
                        </Scope>
                        <DFTitle>The SNPN identifier.</DFTitle>
                        <DFType>
                            <MIME>text/plain</MIME>
                        </DFType>
                    </DFProperties>
                </Node>
                <Node>
                    <NodeName>3GPP_PS_data_off</NodeName>
                    <DFProperties>
                        <AccessType>
                            <Get/>
                            <Replace/>
                        </AccessType>
                        <DFFormat>
                            <node/>
                        </DFFormat>
                        <Occurrence>
                            <ZeroOrOne/>
                        </Occurrence>
                        <Scope>
                            <Dynamic/>
                        </Scope>
                        <DFTitle>Configuration parameters for 3GPP PS data off.</DFTitle>
                        <DFType>
                            <DDFName/>
                        </DFType>
                    </DFProperties>
```

```xml
                                <Node>
                                    <NodeName>USSI_exempt</NodeName>
                                    <DFProperties>
                                        <AccessType>
                                            <Get/>
                                            <Replace/>
                                        </AccessType>
                                        <DFFormat>
                                            <bool/>
                                        </DFFormat>
                                        <Occurrence>
                                            <One/>
                                        </Occurrence>
                                        <Scope>
                                            <Dynamic/>
                                        </Scope>
                                        <DFTitle>Whether the USSI is a 3GPP PS data off exempt
service.</DFTitle>
                                        <DFType>
                                            <MIME>text/plain</MIME>
                                        </DFType>
                                    </DFProperties>
                                </Node>
                                <Node>
                                    <NodeName>USSI_non-subscibed_exempt</NodeName>
                                    <DFProperties>
                                        <AccessType>
                                            <Get/>
                                            <Replace/>
                                        </AccessType>
                                        <DFFormat>
                                            <bool/>
                                        </DFFormat>
                                        <Occurrence>
                                            <ZeroOrOne/>
                                        </Occurrence>
                                        <Scope>
                                            <Dynamic/>
                                        </Scope>
                                        <DFTitle>Whether the USSI is a 3GPP PS data off non-subscribed exempt
service.</DFTitle>
                                        <DFType>
                                            <MIME>text/plain</MIME>
                                        </DFType>
                                    </DFProperties>
                                </Node>
                            </Node>
                        </Node>
                    </Node>
                    <Node>
                        <NodeName>Ext</NodeName>
                        <!-- The Extension node starts here. -->
                        <DFProperties>
                            <AccessType>
                                <Get/>
                            </AccessType>
                            <DFFormat>
                                <node/>
                            </DFFormat>
                            <Occurrence>
                                <ZeroOrOne/>
                            </Occurrence>
                            <Scope>
                                <Dynamic/>
                            </Scope>
                            <DFTitle>A collection of all Extension objects.</DFTitle>
                            <DFType>
                                <DDFName/>
                            </DFType>
                        </DFProperties>
                    </Node>
                </Node>
            </MgmtTree>
```

Annex B (informative):
Change history

Change history								
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment		Old	New
2014-05					Version 0.1.0: based on C1-141702, C1-141703, C1-141704			0.1.0
2014-06	CT-64	CP-140281			Version 1.0.0 created for presentation for information and approval		0.1.0	1.0.0
2014-06	CT-64	CP-140455					1.0.0	2.0.0
2014-06	Post CT-64				Version 12.0.0 created after approval at CT-64		2.0.0	12.0.0
2014-09	CT-65	CP-140668	0001		Fixing access types not aligned in clause 5 and annex A		12.0.0	12.1.0
2014-12	CT-66	CP-140853	0002		Resolving editor's note on registration of MOID with OMA		12.1.0	12.2.0
2015-12	CT-70				Upgrade to Rel-13		12.2.0	13.0.0

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2017-03	CT-75	CP-170130	0003		B	USSI configuration for 3GPP PS Data Off	14.0.0
2018-06	CT-80	CP-181074	0004	2	B	USSI configuration for 3GPP PS Data Off2	15.0.0
2018-12	CT-82	CP-183077	0005		F	Addition of the object identifier in the DDF of the 3GPP Management Object	16.0.0
2022-03	CT-95e	CP-220237	0006	1	B	SNPN configuration for USSI	17.0.0

History

Document history		
V17.0.0	May 2022	Publication