

ETSI TS 129 502 V19.6.0 (2026-03)



TECHNICAL SPECIFICATION

**5G;
5G System;
Session Management Services;
Stage 3
(3GPP TS 29.502 version 19.6.0 Release 19)**



Reference

RTS/TSGC-0429502vj60

Keywords

5G

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 the
[ETSI Search & Browse Standards](#) application.

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 on [ETSI deliver](#) repository.

Users should be aware that the present document may be revised or have its status changed, this information is available in the [Milestones listing](#).

If you find errors in the present document, please send your comments to the relevant service listed under [Committee Support Staff](#).

If you find a security vulnerability in the present document, please report it through our [Coordinated Vulnerability Disclosure \(CVD\)](#) program.

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 2026.
All rights reserved.

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 IPR online database](#).

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™**, **LTE™** and **5G™** logo 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 at [3GPP to ETSI numbering cross-referencing](#).

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

| | |
|---|----|
| Intellectual Property Rights | 2 |
| Legal Notice | 2 |
| Modal verbs terminology..... | 2 |
| Foreword..... | 10 |
| 1 Scope | 12 |
| 2 References | 12 |
| 3 Definitions and abbreviations..... | 14 |
| 3.1 Definitions | 14 |
| 3.2 Abbreviations | 14 |
| 4 Overview | 15 |
| 4.1 Introduction | 15 |
| 5 Services offered by the SMF | 15 |
| 5.1 Introduction | 15 |
| 5.2 Nsmf_PDU Session Service | 16 |
| 5.2.1 Service Description..... | 16 |
| 5.2.2 Service Operations..... | 17 |
| 5.2.2.1 Introduction..... | 17 |
| 5.2.2.2 Create SM Context service operation..... | 18 |
| 5.2.2.2.1 General | 18 |
| 5.2.2.2.2 EPS to 5GS Idle mode mobility using N26 interface (with or without data forwarding)..... | 22 |
| 5.2.2.2.3 EPS to 5GS Handover Preparation using N26 interface..... | 24 |
| 5.2.2.2.4 I-SMF Insertion, Change or Removal during Xn based Handover..... | 25 |
| 5.2.2.2.5 I-SMF Insertion, Change or Removal during N2 based Handover..... | 26 |
| 5.2.2.2.6 Service Request with I-SMF insertion/change/removal or with V-SMF change..... | 26 |
| 5.2.2.2.7 Registration procedure for a UE with a PDU session with I-SMF or V-SMF insertion, change and removal | 27 |
| 5.2.2.2.8 SMF Context Transfer procedure, LBO or no Roaming, no I-SMF..... | 28 |
| 5.2.2.2.9 I-SMF Context Transfer procedure | 28 |
| 5.2.2.2.10 Handover between 3GPP and non-3GPP accesses with I-SMF insertion/removal or V-SMF change..... | 29 |
| 5.2.2.2.11 Void..... | 29 |
| 5.2.2.2.12 SMF triggered I-SMF selection/removal or V-SMF selection | 29 |
| 5.2.2.3 Update SM Context service operation..... | 30 |
| 5.2.2.3.1 General | 30 |
| 5.2.2.3.2 Activation and Deactivation of the User Plane connection of a PDU session..... | 33 |
| 5.2.2.3.2.1 General..... | 33 |
| 5.2.2.3.2.2 Activation of User Plane connectivity of a PDU session..... | 34 |
| 5.2.2.3.2.3 Deactivation of User Plane connectivity of a PDU session | 35 |
| 5.2.2.3.2.4 Changing the access type of a PDU session from non-3GPP access to 3GPP access during a Service Request procedure..... | 36 |
| 5.2.2.3.3 Xn Handover | 37 |
| 5.2.2.3.4 N2 Handover | 38 |
| 5.2.2.3.4.1 General..... | 38 |
| 5.2.2.3.4.2 N2 Handover Preparation | 39 |
| 5.2.2.3.4.3 N2 Handover Execution..... | 41 |
| 5.2.2.3.4.4 N2 Handover Cancellation..... | 42 |
| 5.2.2.3.5 Handover between 3GPP and untrusted non-3GPP access procedures | 42 |
| 5.2.2.3.5.1 General..... | 42 |
| 5.2.2.3.5.2 Handover of a PDU session without AMF change or with target AMF in same PLMN..... | 42 |
| 5.2.2.3.6 Inter-AMF change or mobility | 43 |
| 5.2.2.3.7 RAN Initiated QoS Flow Mobility | 44 |
| 5.2.2.3.8 EPS to 5GS Handover using N26 interface | 45 |
| 5.2.2.3.8.1 General..... | 45 |

| | | |
|--------------|---|----|
| 5.2.2.3.8.2 | EPS to 5GS Handover Preparation | 45 |
| 5.2.2.3.8.3 | EPS to 5GS Handover Execution..... | 45 |
| 5.2.2.3.8.4 | EPS to 5GS Handover Cancellation..... | 46 |
| 5.2.2.3.8.5 | EPS to 5GS Handover Failure | 46 |
| 5.2.2.3.9 | 5GS to EPS Handover using N26 interface..... | 46 |
| 5.2.2.3.9.1 | General..... | 46 |
| 5.2.2.3.9.2 | Data forwarding tunnels setup during 5GS to EPS handover | 46 |
| 5.2.2.3.9.3 | Indirect data forwarding tunnels removal for 5GS to EPS handover cancellation or failure | 47 |
| 5.2.2.3.10 | P-CSCF Restoration Procedure via AMF..... | 47 |
| 5.2.2.3.11 | AMF requested PDU Session Release due to duplicated PDU Session Id..... | 48 |
| 5.2.2.3.12 | AMF requested PDU Session Release due to slice not available | 48 |
| 5.2.2.3.13 | Indirect Data Forwarding Tunnel establishment during N2 based Handover with I-SMF | 48 |
| 5.2.2.3.13A | Indirect Data Forwarding Tunnel removal during N2 based Handover with I-SMF..... | 49 |
| 5.2.2.3.14 | Request to forward buffered downlink data packets at I-UPF..... | 50 |
| 5.2.2.3.15 | Connection Suspend procedure | 51 |
| 5.2.2.3.16 | Connection Resume in CM-IDLE with Suspend procedure..... | 51 |
| 5.2.2.3.17 | AMF requested PDU Session Release due to Network Slice-Specific Authentication and Authorization failure or revocation | 52 |
| 5.2.2.3.18 | 5GS to EPS Idle mode mobility using N26 interface with data forwarding..... | 52 |
| 5.2.2.3.19 | AMF requested PDU Session Release due to Control Plane Only indication associated with PDU Session is not applicable any longer | 53 |
| 5.2.2.3.20 | AMF requested PDU Session Release due to ODB changes..... | 53 |
| 5.2.2.3.21 | N9 Forwarding Tunnel establishment between Branching Points or UL CLs controlled by different I-SMFs | 53 |
| 5.2.2.3.22 | Remote UE Report during 5G ProSe Communication via 5G ProSe Layer-3 UE-to-Network Relay without N3IWF procedure..... | 54 |
| 5.2.2.3.23 | AMF requested PDU Session Release due to V/I-SMF failure..... | 54 |
| 5.2.2.3.24 | Connection Inactive procedure with CN based MT communication handling..... | 55 |
| 5.2.2.3.25 | UE Triggered Connection Resume in RRC Inactive procedure | 55 |
| 5.2.2.3.26 | AMF requested PDU Session Release due to Network Slice instance not available..... | 56 |
| 5.2.2.3.27 | AMF requested PDU Session Release due to MBSR not authorized | 57 |
| 5.2.2.3.28 | AMF correlated UDM Re-Discovery for UDR Restoration during Subscription Data Migration..... | 57 |
| 5.2.2.3.29 | AMF indication of AMF Data Restoration resynchronization is initiated..... | 57 |
| 5.2.2.4 | Release SM Context service operation..... | 57 |
| 5.2.2.4.1 | General | 57 |
| 5.2.2.5 | Notify SM Context Status service operation..... | 60 |
| 5.2.2.5.1 | General | 60 |
| 5.2.2.6 | Retrieve SM Context service operation..... | 63 |
| 5.2.2.6.1 | General | 63 |
| 5.2.2.7 | Create service operation..... | 66 |
| 5.2.2.7.1 | General | 66 |
| 5.2.2.7.2 | EPS to 5GS Idle mode mobility | 71 |
| 5.2.2.7.3 | EPS to 5GS Handover Preparation | 71 |
| 5.2.2.7.4 | N2 Handover Preparation with I-SMF Insertion | 72 |
| 5.2.2.7.5 | Xn Handover with I-SMF Insertion..... | 72 |
| 5.2.2.7.6 | UE Triggered Service Request with I-SMF Insertion..... | 73 |
| 5.2.2.8 | Update service operation..... | 73 |
| 5.2.2.8.1 | General | 73 |
| 5.2.2.8.2 | Update service operation towards H-SMF or SMF | 75 |
| 5.2.2.8.2.1 | General..... | 75 |
| 5.2.2.8.2.2 | UE or network (e.g. AMF, V-SMF, I-SMF) requested PDU session modification | 76 |
| 5.2.2.8.2.3 | UE requested PDU session release | 77 |
| 5.2.2.8.2.4 | EPS to 5GS Handover Execution..... | 77 |
| 5.2.2.8.2.5 | Handover between 3GPP access and untrusted or trusted non-3GPP access..... | 78 |
| 5.2.2.8.2.6 | P-CSCF Restoration Procedure via AMF | 79 |
| 5.2.2.8.2.7 | Addition of PSA and BP or UL CL controlled by I-SMF..... | 79 |
| 5.2.2.8.2.8 | Removal of PSA and BP or UL CL controlled by I-SMF..... | 79 |
| 5.2.2.8.2.9 | Change of PSA for IPv6 multi-homing or UL CL controlled by I-SMF | 80 |
| 5.2.2.8.2.10 | PDU Session modification with I-SMF or V-SMF change..... | 80 |
| 5.2.2.8.2.11 | Sending by I-SMF of N4 notifications related with traffic usage reporting..... | 81 |
| 5.2.2.8.2.12 | N2 Handover Execution with I-SMF Insertion | 81 |

| | | |
|--------------|--|-----|
| 5.2.2.8.2.13 | N2 Handover Cancellation with I-SMF Insertion | 82 |
| 5.2.2.8.2.14 | EPS to 5GS Handover Cancellation..... | 82 |
| 5.2.2.8.2.15 | 5G-AN requested PDU session resource release | 82 |
| 5.2.2.8.2.16 | Xn Handover with or without I-SMF or V-SMF Change | 83 |
| 5.2.2.8.2.17 | EPS to 5GS Handover Failure | 83 |
| 5.2.2.8.2.18 | EPS Bearer ID revocation..... | 84 |
| 5.2.2.8.2.19 | Network requested PDU session release..... | 84 |
| 5.2.2.8.2.20 | N2 Handover Execution with or without I-SMF or V-SMF Change | 84 |
| 5.2.2.8.2.21 | Reporting of satellite backhaul change to (H-)SMF | 84 |
| 5.2.2.8.2.22 | Simultaneous change of PSA and BP or UL CL controlled by I-SMF..... | 85 |
| 5.2.2.8.2.23 | Service Request without I-SMF/V-SMF Change or with I-SMF/V-SMF Change or with I-SMF Insertion | 85 |
| 5.2.2.8.2.24 | Remote UE Report during 5G ProSe Communication via 5G ProSe Layer-3 UE-to-Network Relay without N3IWF..... | 87 |
| 5.2.2.8.2.25 | AMF correlated UDM Re-Discovery for UDR Restoration during Subscription Data Migration | 87 |
| 5.2.2.8.2.26 | AMF indication of AMF Data Restoration resynchronization is initiated | 87 |
| 5.2.2.8.2.27 | Update of PDU Session with Non-3GPP Device Connection Information | 87 |
| 5.2.2.8.2.28 | Reporting of UpCnxState change to (H-)SMF..... | 87 |
| 5.2.2.8.3 | Update service operation towards V-SMF or I-SMF..... | 88 |
| 5.2.2.8.3.1 | General..... | 88 |
| 5.2.2.8.3.2 | Network (e.g. H-SMF, SMF) requested PDU session modification | 89 |
| 5.2.2.8.3.3 | Network (e.g. H-SMF, SMF) or UE requested PDU session release..... | 90 |
| 5.2.2.8.3.4 | Handover between 3GPP and untrusted non-3GPP access, from 5GC-N3IWF to EPS or from 5GS to EPC/ePDG | 91 |
| 5.2.2.8.3.5 | EPS Bearer ID assignment..... | 91 |
| 5.2.2.8.3.6 | Addition of PSA and BP or UL CL controlled by I-SMF..... | 92 |
| 5.2.2.8.3.7 | Removal of PSA and BP or UL CL controlled by I-SMF..... | 92 |
| 5.2.2.8.3.8 | Change of PSA for IPv6 multi-homing or UL CL controlled by I-SMF | 93 |
| 5.2.2.8.3.9 | Policy update procedures with an I-SMF..... | 93 |
| 5.2.2.8.3.10 | Simultaneous change of PSA and BP or UL CL controlled by I-SMF..... | 94 |
| 5.2.2.8.3.11 | Network (e.g. AMF) triggered network slice replacement with PDU session retained | 94 |
| 5.2.2.8.3.12 | NetLoc Information Retrieval over N16/N16a | 95 |
| 5.2.2.9 | Release service operation..... | 95 |
| 5.2.2.9.1 | General | 95 |
| 5.2.2.10 | Notify Status service operation | 96 |
| 5.2.2.10.1 | General | 96 |
| 5.2.2.11 | Send MO Data service operation | 98 |
| 5.2.2.11.1 | General | 98 |
| 5.2.2.12 | Transfer MO Data service operation..... | 99 |
| 5.2.2.12.1 | General | 99 |
| 5.2.2.13 | Transfer MT Data service operation | 100 |
| 5.2.2.13.1 | General | 100 |
| 5.2.2.14 | Retrieve service operation..... | 101 |
| 5.2.2.14.1 | General | 101 |
| 5.2.3 | General procedures | 102 |
| 5.2.3.1 | Transfer of NAS SM information between UE and H-SMF for Home Routed PDU sessions | 102 |
| 5.2.3.1.1 | General | 102 |
| 5.2.3.1.2 | V-SMF Behaviour | 102 |
| 5.2.3.1.3 | H-SMF Behaviour | 102 |
| 5.2.3.2 | Transfer of NAS SM information between UE and SMF for PDU sessions with an I-SMF | 103 |
| 5.2.3.2.1 | General | 103 |
| 5.2.3.3 | Detection and handling of late arriving requests..... | 103 |
| 5.2.3.3.1 | Handling of requests which collide with an existing SM context or PDU session context | 103 |
| 5.2.3.3.1.1 | General..... | 103 |
| 5.2.3.3.1.2 | Principles | 103 |
| 5.2.3.3.2 | Detection and handling of requests which have timed out at the HTTP client..... | 103 |
| 5.2.3.3.2.1 | General..... | 103 |
| 5.2.3.4 | UE Location Information | 104 |
| 6 | API Definitions | 104 |
| 6.1 | Nsmf_PDUSession Service API..... | 104 |

| | | |
|---------------|---|-----|
| 6.1.1 | API URI..... | 104 |
| 6.1.2 | Usage of HTTP..... | 105 |
| 6.1.2.1 | General..... | 105 |
| 6.1.2.2 | HTTP standard headers..... | 105 |
| 6.1.2.2.1 | General..... | 105 |
| 6.1.2.2.2 | Content type..... | 105 |
| 6.1.2.3 | HTTP custom headers..... | 105 |
| 6.1.2.3.1 | General..... | 105 |
| 6.1.2.3.2 | 3gpp-Sbi-Origination-Timestamp..... | 106 |
| 6.1.2.4 | HTTP multipart messages..... | 106 |
| 6.1.2.5 | HTTP/2 request retries..... | 106 |
| 6.1.3 | Resources..... | 107 |
| 6.1.3.1 | Overview..... | 107 |
| 6.1.3.2 | Resource: SM contexts collection..... | 109 |
| 6.1.3.2.1 | Description..... | 109 |
| 6.1.3.2.2 | Resource Definition..... | 109 |
| 6.1.3.2.3 | Resource Standard Methods..... | 110 |
| 6.1.3.2.3.1 | POST..... | 110 |
| 6.1.3.2.4 | Resource Custom Operations..... | 114 |
| 6.1.3.3 | Resource: Individual SM context..... | 114 |
| 6.1.3.3.1 | Description..... | 114 |
| 6.1.3.3.2 | Resource Definition..... | 114 |
| 6.1.3.3.3 | Resource Standard Methods..... | 114 |
| 6.1.3.3.4 | Resource Custom Operations..... | 114 |
| 6.1.3.3.4.1 | Overview..... | 114 |
| 6.1.3.3.4.2 | Operation: modify..... | 115 |
| 6.1.3.3.4.2.1 | Description..... | 115 |
| 6.1.3.3.4.2.2 | Operation Definition..... | 115 |
| 6.1.3.3.4.3 | Operation: release..... | 119 |
| 6.1.3.3.4.3.1 | Description..... | 119 |
| 6.1.3.3.4.3.2 | Operation Definition..... | 119 |
| 6.1.3.3.4.4 | Operation: retrieve..... | 120 |
| 6.1.3.3.4.4.1 | Description..... | 120 |
| 6.1.3.3.4.4.2 | Operation Definition..... | 120 |
| 6.1.3.3.4.5 | Operation: send-mo-data..... | 121 |
| 6.1.3.3.4.5.1 | Description..... | 121 |
| 6.1.3.3.4.5.2 | Operation Definition..... | 121 |
| 6.1.3.4 | Void..... | 123 |
| 6.1.3.5 | Resource: PDU sessions collection (H-SMF or SMF)..... | 123 |
| 6.1.3.5.1 | Description..... | 123 |
| 6.1.3.5.2 | Resource Definition..... | 123 |
| 6.1.3.5.3 | Resource Standard Methods..... | 123 |
| 6.1.3.5.3.1 | POST..... | 123 |
| 6.1.3.5.4 | Resource Custom Operations..... | 126 |
| 6.1.3.5.4.1 | Overview..... | 126 |
| 6.1.3.6 | Resource: Individual PDU session (H-SMF or SMF)..... | 126 |
| 6.1.3.6.1 | Description..... | 126 |
| 6.1.3.6.2 | Resource Definition..... | 127 |
| 6.1.3.6.3 | Resource Standard Methods..... | 127 |
| 6.1.3.6.4 | Resource Custom Operations..... | 127 |
| 6.1.3.6.4.1 | Overview..... | 127 |
| 6.1.3.6.4.2 | Operation: modify..... | 127 |
| 6.1.3.6.4.2.1 | Description..... | 127 |
| 6.1.3.6.4.2.2 | Operation Definition..... | 127 |
| 6.1.3.6.4.3 | Operation: release..... | 129 |
| 6.1.3.6.4.3.1 | Description..... | 129 |
| 6.1.3.6.4.3.2 | Operation Definition..... | 129 |
| 6.1.3.6.4.4 | Operation: transfer-mo-data..... | 130 |
| 6.1.3.6.4.4.1 | Description..... | 130 |
| 6.1.3.6.4.4.2 | Operation Definition..... | 130 |
| 6.1.3.6.4.5 | Operation: retrieve..... | 131 |
| 6.1.3.6.4.5.1 | Description..... | 131 |

| | | |
|---------------|---|-----|
| 6.1.3.6.4.5.2 | Operation Definition | 131 |
| 6.1.3.7 | Resource: Individual PDU session (V-SMF or I-SMF) | 132 |
| 6.1.3.7.1 | Description | 132 |
| 6.1.3.7.2 | Resource Definition | 132 |
| 6.1.3.7.3 | Resource Standard Methods | 132 |
| 6.1.3.7.3.1 | POST | 132 |
| 6.1.3.7.4 | Resource Custom Operations | 134 |
| 6.1.3.7.4.1 | Overview | 134 |
| 6.1.3.7.4.2 | Operation: modify | 134 |
| 6.1.3.7.4.2.1 | Description | 134 |
| 6.1.3.7.4.2.2 | Operation Definition | 134 |
| 6.1.3.7.4.3 | Operation: transfer-mt-data | 137 |
| 6.1.3.7.4.3.1 | Description | 137 |
| 6.1.3.7.4.3.2 | Operation Definition | 137 |
| 6.1.4 | Custom Operations without associated resources | 138 |
| 6.1.5 | Notifications | 138 |
| 6.1.5.1 | General | 138 |
| 6.1.5.2 | SM Context Status Notification | 139 |
| 6.1.5.2.1 | Description | 139 |
| 6.1.5.2.2 | Notification Definition | 139 |
| 6.1.6 | Data Model | 140 |
| 6.1.6.1 | General | 140 |
| 6.1.6.2 | Structured data types | 147 |
| 6.1.6.2.1 | Introduction | 147 |
| 6.1.6.2.2 | Type: SmContextCreateData | 148 |
| 6.1.6.2.3 | Type: SmContextCreatedData | 165 |
| 6.1.6.2.4 | Type: SmContextUpdateData | 169 |
| 6.1.6.2.5 | Type: SmContextUpdatedData | 181 |
| 6.1.6.2.6 | Type: SmContextReleaseData | 185 |
| 6.1.6.2.7 | Type: SmContextRetrieveData | 188 |
| 6.1.6.2.8 | Type: SmContextStatusNotification | 191 |
| 6.1.6.2.9 | Type: PduSessionCreateData | 195 |
| 6.1.6.2.10 | Type: PduSessionCreatedData | 206 |
| 6.1.6.2.11 | Type: HsmfUpdateData | 213 |
| 6.1.6.2.12 | Type: HsmfUpdatedData | 226 |
| 6.1.6.2.13 | Type: ReleaseData | 231 |
| 6.1.6.2.14 | Type: HsmfUpdateError | 232 |
| 6.1.6.2.15 | Type: VsmfUpdateData | 233 |
| 6.1.6.2.16 | Type: VsmfUpdatedData | 239 |
| 6.1.6.2.17 | Type: StatusNotification | 243 |
| 6.1.6.2.18 | Type: QosFlowItem | 245 |
| 6.1.6.2.19 | Type: QosFlowSetupItem | 246 |
| 6.1.6.2.20 | Type: QosFlowAddModifyRequestItem | 247 |
| 6.1.6.2.21 | Type: QosFlowReleaseRequestItem | 248 |
| 6.1.6.2.22 | Type: QosFlowProfile | 249 |
| 6.1.6.2.23 | Type: GbrQosFlowInformation | 252 |
| 6.1.6.2.24 | Type: QosFlowNotifyItem | 252 |
| 6.1.6.2.25 | Type: Void | 253 |
| 6.1.6.2.26 | Type: Void | 253 |
| 6.1.6.2.27 | Type: SmContextRetrievedData | 253 |
| 6.1.6.2.28 | Type: TunnelInfo | 254 |
| 6.1.6.2.29 | Type: StatusInfo | 254 |
| 6.1.6.2.30 | Type: VsmfUpdateError | 255 |
| 6.1.6.2.31 | Type: EpsPdnCnxInfo | 257 |
| 6.1.6.2.32 | Type: EpsBearerInfo | 257 |
| 6.1.6.2.33 | Type: PduSessionNotifyItem | 258 |
| 6.1.6.2.34 | Type: EbiArpMapping | 258 |
| 6.1.6.2.35 | Type: SmContextCreateError | 258 |
| 6.1.6.2.36 | Type: SmContextUpdateError | 259 |
| 6.1.6.2.37 | Type: PduSessionCreateError | 260 |
| 6.1.6.2.38 | Type: MmcCapabilities | 261 |
| 6.1.6.2.39 | Type: SmContext | 262 |

| | | |
|------------|--|-----|
| 6.1.6.2.40 | Type: ExemptionInd | 272 |
| 6.1.6.2.41 | Type: PsaInformation | 272 |
| 6.1.6.2.42 | Type: DnaiInformation | 273 |
| 6.1.6.2.43 | Type: N4Information | 273 |
| 6.1.6.2.44 | Type: IndirectDataForwardingTunnelInfo | 274 |
| 6.1.6.2.45 | Type: SmContextReleasedData | 274 |
| 6.1.6.2.46 | Type: ReleasedData | 275 |
| 6.1.6.2.47 | Type: SendMoDataReqData | 275 |
| 6.1.6.2.48 | Type: CnAssistedRanPara | 276 |
| 6.1.6.2.49 | Type: UlclBpInformation | 276 |
| 6.1.6.2.50 | Type: TransferMoDataReqData | 276 |
| 6.1.6.2.51 | Type: TransferMtDataReqData | 277 |
| 6.1.6.2.52 | Type: TransferMtDataError | 277 |
| 6.1.6.2.53 | Type: TransferMtDataAddInfo | 277 |
| 6.1.6.2.54 | Type: VplmnQos | 278 |
| 6.1.6.2.55 | Type: DdnFailureSubs | 278 |
| 6.1.6.2.56 | Type: RetrieveData | 279 |
| 6.1.6.2.57 | Type: RetrievedData | 279 |
| 6.1.6.2.58 | Type: SecurityResult | 279 |
| 6.1.6.2.59 | Type: UpSecurityInfo | 280 |
| 6.1.6.2.60 | Type: DdnFailureSubInfo | 280 |
| 6.1.6.2.61 | Type: AlternativeQosProfile | 281 |
| 6.1.6.2.62 | Type: ProblemDetailsAddInfo | 282 |
| 6.1.6.2.63 | Type: ExtProblemDetails | 282 |
| 6.1.6.2.64 | Type: QosMonitoringInfo | 282 |
| 6.1.6.2.65 | Type: IpAddress | 283 |
| 6.1.6.2.66 | Type: RedundantPduSessionInformation | 283 |
| 6.1.6.2.67 | Type: QosFlowTunnel | 283 |
| 6.1.6.2.68 | Type: TargetDnaiInfo | 283 |
| 6.1.6.2.69 | Type: AfCoordinationInfo | 284 |
| 6.1.6.2.70 | Type: NotificationInfo | 284 |
| 6.1.6.2.71 | Type: AnchorSmfFeatures | 284 |
| 6.1.6.2.72 | Type: HrsboInfoFromVplmn | 285 |
| 6.1.6.2.73 | Type: HrsboInfoFromHplmn | 288 |
| 6.1.6.2.74 | Type: EasInfoToRefresh | 291 |
| 6.1.6.2.75 | Type: EcnMarkingCongestionInfoReq | 291 |
| 6.1.6.2.76 | Type: EcnMarkingCongestionInfoStatus | 292 |
| 6.1.6.2.77 | Type: TscAssistanceInformation | 292 |
| 6.1.6.2.78 | Type: N6JitterInformation | 292 |
| 6.1.6.2.79 | Type: TrafficInfluenceInfo | 293 |
| 6.1.6.2.80 | Type: TrafficInfluenceData | 294 |
| 6.1.6.2.81 | Type: LocalOffloadingMgtInfoFromIsmf | 295 |
| 6.1.6.2.82 | Type: LocalOffloadingMgtInfoToIsmf | 298 |
| 6.1.6.2.83 | Type: AvailableBitrateMonitoringRequest | 299 |
| 6.1.6.3 | Simple data types and enumerations | 299 |
| 6.1.6.3.1 | Introduction | 299 |
| 6.1.6.3.2 | Simple data types | 299 |
| 6.1.6.3.3 | Enumeration: UpCnxState | 302 |
| 6.1.6.3.4 | Enumeration: HoState | 302 |
| 6.1.6.3.5 | Enumeration: RequestType | 302 |
| 6.1.6.3.6 | Enumeration: RequestIndication | 302 |
| 6.1.6.3.7 | Enumeration: NotificationCause | 303 |
| 6.1.6.3.8 | Enumeration: Cause | 303 |
| 6.1.6.3.9 | Enumeration: ResourceStatus | 307 |
| 6.1.6.3.10 | Enumeration: DnnSelectionMode | 308 |
| 6.1.6.3.11 | Enumeration: EpsInterworkingIndication | 308 |
| 6.1.6.3.12 | Enumeration: N2SmInfoType | 309 |
| 6.1.6.3.13 | Enumeration: MaxIntegrityProtectedDataRate | 310 |
| 6.1.6.3.14 | Enumeration: MaReleaseIndication | 310 |
| 6.1.6.3.15 | Enumeration: SmContextType | 310 |
| 6.1.6.3.16 | Enumeration: PsaIndication | 310 |
| 6.1.6.3.17 | Enumeration: N4MessageType | 310 |

| | | |
|---|---|------------|
| 6.1.6.3.18 | Enumeration: QosFlowAccessType | 311 |
| 6.1.6.3.19 | Enumeration: UnavailableAccessIndication | 311 |
| 6.1.6.3.20 | Enumeration: ProtectionResult | 311 |
| 6.1.6.3.21 | Enumeration: QosMonitoringReq | 311 |
| 6.1.6.3.22 | Enumeration: Rsn | 312 |
| 6.1.6.3.23 | Enumeration: SmfSelectionType | 312 |
| 6.1.6.3.24 | Enumeration: PduSessionContextType | 312 |
| 6.1.6.3.25 | Enumeration: PendingUpdateInfo | 312 |
| 6.1.6.3.26 | Enumeration: EstablishmentRejectionCause | 312 |
| 6.1.6.3.27 | Enumeration: EcnMarkingReq | 313 |
| 6.1.6.3.28 | Enumeration: CongestionInfoReq | 313 |
| 6.1.6.3.29 | Enumeration: ActivationStatus | 313 |
| 6.1.6.3.30 | Enumeration: QosMonitoringPdSupported | 313 |
| 6.1.6.3.31 | Enumeration: QosMonitoringCongestionSupported | 314 |
| 6.1.6.3.32 | Enumeration: AvailableBitrateRequest | 314 |
| 6.1.6.3.33 | Enumeration: AvailBitRateMonSupported | 314 |
| 6.1.6.3.34 | Enumeration: UliChangeGranularity | 314 |
| 6.1.6.3.35 | Enumeration: QosMonitoringPdMethod | 314 |
| 6.1.6.4 | Binary data | 315 |
| 6.1.6.4.1 | Introduction | 315 |
| 6.1.6.4.2 | N1 SM Message | 315 |
| 6.1.6.4.3 | N2 SM Information | 315 |
| 6.1.6.4.4 | n1SmInfoFromUe, n1SmInfoToUe, unknownN1SmInfo | 316 |
| 6.1.6.4.5 | N4 Message Payload | 318 |
| 6.1.6.4.6 | Mobile Originated Data | 318 |
| 6.1.6.4.7 | Mobile Terminated Data | 319 |
| 6.1.7 | Error Handling | 319 |
| 6.1.7.1 | General | 319 |
| 6.1.7.2 | Protocol Errors | 319 |
| 6.1.7.3 | Application Errors | 319 |
| 6.1.8 | Feature Negotiation | 323 |
| 6.1.9 | Security | 329 |
| 6.1.10 | HTTP redirection | 330 |
| Annex A (normative): OpenAPI specification | | 331 |
| A.1 | General | 331 |
| A.2 | Nsmf_PDUSession API | 331 |
| Annex B (Informative): HTTP Multipart Messages | | 405 |
| B.1 | Example of HTTP multipart message | 405 |
| B.1.1 | General | 405 |
| B.1.2 | Example HTTP multipart message with N1 SM Message binary data | 405 |
| Annex C (Normative): ABNF grammar for 3GPP SBI HTTP custom headers | | 406 |
| C.1 | General | 406 |
| C.2 | ABNF definitions (Filename: "TS29502_CustomHeaders.abnf") | 406 |
| Annex D (Informative): Charging Identifier Handling | | 408 |
| D.1 | Usage of Charging ID and SMF Charging ID | 408 |
| D.1.1 | General | 408 |
| D.1.2 | HPLMN supporting the SMF Charging ID | 408 |
| D.1.3 | HPLMN not supporting the SMF Charging ID | 408 |
| D.1.4 | Transfer of (SMF) Charging ID between SMFs | 408 |
| Annex E (informative): Change history | | 410 |
| History | | 422 |

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.

In the present document, modal verbs have the following meanings:

shall indicates a mandatory requirement to do something

shall not indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

should indicates a recommendation to do something

should not indicates a recommendation not to do something

may indicates permission to do something

need not indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

can indicates that something is possible

cannot indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

will indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

will not indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

might indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

might not indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

is (or any other verb in the indicative mood) indicates a statement of fact

is not (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

Sample Document

get full document from standards.iteh.ai

1 Scope

The present document specifies the stage 3 protocol and data model for the Nsmf Service Based Interface. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the SMF other than the Session Management Event Exposure service and Session Management services for Non-IP Data Delivery (NIDD).

The 5G System stage 2 architecture and procedures are specified in 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3].

The Technical Realization of the Service Based Architecture and the Principles and Guidelines for Services Definition are specified in 3GPP TS 29.500 [4] and 3GPP TS 29.501 [5].

The Session Management Event Exposure Service is specified in 3GPP TS 29.508 [6]. The Session Management services for Non-IP Data Delivery (NIDD) are specified in 3GPP TS 29.542 [37].

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] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".
- [3] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".
- [4] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".
- [5] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".
- [6] 3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".
- [7] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".
- [8] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".
- [9] 3GPP TS 38.413: "NG Radio Access Network (NG-RAN); NG Application Protocol (NGAP)".
- [10] IETF RFC 2387: "The MIME Multipart/Related Content-type".
- [11] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".
- [12] IETF RFC 2045: "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".
- [13] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".
- [14] IETF RFC 9113: "HTTP/2".
- [15] OpenAPI Initiative, "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.
- [16] 3GPP TS 29.274: "3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3".
- [17] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

- [18] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".
- [19] 3GPP TS 29.510: "Network Function Repository Services; Stage 3".
- [20] 3GPP TS 29.518: "5G System; Access and Mobility Management Service; Stage 3".
- [21] 3GPP TS 23.380: "IMS Restoration Procedures".
- [22] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".
- [23] IETF RFC 9457: "Problem Details for HTTP APIs".
- [24] 3GPP TS 23.527: "5G System; Restoration Procedures".
- [25] 3GPP TS 32.255: "Charging management; 5G data connectivity domain charging; stage 2".
- [26] 3GPP TS 32.291: "Charging management; 5G system, charging service; Stage 3".
- [27] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".
- [28] 3GPP TR 21.900: "Technical Specification Group working methods".
- [29] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane Nodes; stage 3".
- [30] 3GPP TS 29.512: "5G System; Session Management Policy Control Service; Stage 3".
- [31] Void
- [32] IETF RFC 9110: "HTTP Semantics".
- [33] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access; Stage 2".
- [34] 3GPP TS 29.524: "5G System; Cause codes mapping between 5GC interfaces; Stage 3".
- [35] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2".
- [36] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".
- [37] 3GPP TS 29.542: "5G System; Session Management Services for Non-IP Data Delivery (NIDD); Stage 3".
- [38] 3GPP TS 29.519: "5G System; Usage of the Unified Data Repository service for Policy Control Data, Application Data and Structured Data for Exposure; Stage 3".
- [39] 3GPP TS 23.548: "5G System Enhancements for Edge Computing; Stage 2".
- [40] 3GPP TS 29.531: "5G System; Network Slice Selection Services; Stage 3".
- [41] 3GPP TS 23.256: "Support of Uncrewed Aerial Systems (UAS) connectivity, identification and tracking; Stage 2".
- [42] 3GPP TS 23.015: "Technical realization of Operator Determined Barring (ODB)".
- [43] 3GPP TS 23.304: "Proximity based Services (ProSe) in the 5G System (5GS)".
- [44] 3GPP TS 23.247: "Architectural enhancements for 5G multicast-broadcast services; Stage 2".
- [45] 3GPP TS 23.007: "Restoration procedures".
- [46] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".
- [47] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".
- [48] 3GPP TS 29.564: "5G System; User Plane Function Services; Stage 3".

[49] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

3 Definitions 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].

Alternative S-NSSAI: Indicating a compatible S-NSSAI for an S-NSSAI in the Allowed NSSAI that the AMF uses to replace an S-NSSAI when the S-NSSAI is not available or congested, as specified in 3GPP TS 23.501 [2].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and 3GPP TS 23.501 [2] and the following apply. An abbreviation defined in the present document or in 3GPP TS 23.501 [2] takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1]. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TS 23.501 [2].

| | |
|--------|--------------------------------------|
| BP | Branching Point |
| DNAI | Data Network Access Identifier |
| DNN | Data Network Name |
| HR | Home Routed |
| HR-SBO | Home Routed Session BreakOut |
| H-SMF | Home SMF |
| I-SMF | Intermediate SMF |
| JSON | Javascript Object Notation |
| LADN | Local Area Data Network |
| MA | Multi-Access |
| MO | Mobile Originated |
| MT | Mobile Terminated |
| N3QAI | Non-3GPP QoS Assistance Information |
| PIN | Personal IoT Network |
| RSN | Redundancy Sequence Number |
| SM | Session Management |
| SMF | Session Management Function |
| SNPN | Stand-alone Non-Public Network |
| TNGF | Trusted Non-3GPP Gateway Function |
| TWIF | Trusted WLAN Interworking Function |
| UAS | Uncrewed Aerial System |
| UAV | Uncrewed Aerial Vehicle |
| UL CL | Uplink Classifier |
| UPF | User Plane Function |
| USS | UAS Service Supplier |
| UUAA | USS UAV Authorization/Authentication |
| V-SMF | Visited SMF |
| W-AGF | Wireline Access Gateway Function |