

# ETSI TS 123 502 V15.8.0 (2020-01)



## 5G; Procedures for the 5G System (5GS) (3GPP TS 23.502 version 15.8.0 Release 15)

*iTeh STANDARD PREVIEW  
(standards.it-eh.com)  
Full standard available on iTeh website  
<https://standards.it-eh.com/catalog/standards/sstd-76c9ba1-6aad-400e-b85d-1e27553e4b0a/etsi-ts-123-502-v15-8-0-2020-01>*



---

**Reference**

RTS/TSGS-0223502vf80

---

**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 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

---

**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](http://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>

---

**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 2020.  
All rights reserved.

**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.

---

# Intellectual Property Rights

## Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is 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 IPR Policy, no investigation, 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.

---

# 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

Intellectual Property Rights .....	2
Legal Notice .....	2
Modal verbs terminology.....	2
Foreword.....	13
1 Scope .....	14
2 References .....	14
3 Definitions, symbols and abbreviations .....	16
3.1 Definitions .....	16
3.2 Abbreviations .....	16
4 System procedures.....	16
4.1 General .....	16
4.2 Connection, Registration and Mobility Management procedures .....	16
4.2.1 General.....	16
4.2.2 Registration Management procedures.....	16
4.2.2.1 General .....	16
4.2.2.2 Registration procedures.....	16
4.2.2.2.1 General .....	16
4.2.2.2.2 General Registration .....	18
4.2.2.2.3 Registration with AMF re-allocation.....	28
4.2.2.3 Deregistration procedures .....	30
4.2.2.3.1 General .....	30
4.2.2.3.2 UE-initiated Deregistration.....	31
4.2.2.3.3 Network-initiated Deregistration.....	32
4.2.3 Service Request procedures .....	33
4.2.3.1 General .....	33
4.2.3.2 UE Triggered Service Request.....	33
4.2.3.3 Network Triggered Service Request.....	42
4.2.4 UE Configuration Update .....	49
4.2.4.1 General .....	49
4.2.4.2 UE Configuration Update procedure for access and mobility management related parameters .....	49
4.2.4.3 UE Configuration Update procedure for transparent UE Policy delivery .....	52
4.2.5 Reachability procedures.....	53
4.2.5.1 General .....	53
4.2.5.2 UE Reachability Notification Request procedure .....	54
4.2.5.3 UE Activity Notification procedure .....	54
4.2.6 AN Release .....	55
4.2.7 N2 procedures .....	57
4.2.7.1 N2 Configuration .....	57
4.2.7.2 NGAP UE-TNLA-binding related procedures .....	58
4.2.7.2.1 Creating NGAP UE-TNLA-bindings during Registration and Service Request .....	58
4.2.7.2.2 Creating NGAP UE-TNLA-bindings during handovers.....	58
4.2.7.2.3 Re-Creating NGAP UE-TNLA-bindings subsequent to NGAP UE-TNLA-binding release .....	59
4.2.7.2.4 NGAP UE-TNLA-binding update procedure .....	59
4.2.7.2.5 NGAP UE-TNLA-binding per UE Release procedure .....	59
4.2.7.3 AMF Failure or Planned Maintenance handling procedure .....	60
4.2.8 Void .....	60
4.2.8a UE Capability Match Request procedure.....	60
4.3 Session Management procedures .....	61
4.3.1 General.....	61
4.3.2 PDU Session Establishment.....	62
4.3.2.1 General .....	62
4.3.2.2 UE Requested PDU Session Establishment .....	62
4.3.2.2.1 Non-roaming and Roaming with Local Breakout.....	62
4.3.2.2.2 Home-routed Roaming .....	71

4.3.2.2.3	SMF selection.....	75
4.3.2.3	Secondary authorization/authentication by an DN-AAA server during the PDU Session establishment.....	78
4.3.3	PDU Session Modification .....	80
4.3.3.1	General .....	80
4.3.3.2	UE or network requested PDU Session Modification (non-roaming and roaming with local breakout) .....	80
4.3.3.3	UE or network requested PDU Session Modification (home-routed roaming).....	84
4.3.4	PDU Session Release.....	87
4.3.4.1	General .....	87
4.3.4.2	UE or network requested PDU Session Release for Non-Roaming and Roaming with Local Breakout.....	87
4.3.4.3	UE or network requested PDU Session Release for Home-routed Roaming .....	91
4.3.5	Session continuity, service continuity and UP path management.....	93
4.3.5.1	Change of SSC mode 2 PDU Session Anchor with different PDU Sessions .....	93
4.3.5.2	Change of SSC mode 3 PDU Session Anchor with multiple PDU Sessions .....	94
4.3.5.3	Change of SSC mode 3 PDU Session Anchor with IPv6 Multi-homed PDU Session.....	95
4.3.5.4	Addition of additional PDU Session Anchor and Branching Point or UL CL .....	97
4.3.5.5	Removal of additional PDU Session Anchor and Branching Point or UL CL.....	99
4.3.5.6	Change of additional PDU Session Anchor for IPv6 multi-homing or UL CL.....	100
4.3.5.7	Simultaneous change of Branching Point or UL CL and additional PSA for a PDU Session.....	102
4.3.6	Application Function influence on traffic routing .....	104
4.3.6.1	General .....	104
4.3.6.2	Processing AF requests to influence traffic routing for Sessions not identified by an UE address....	105
4.3.6.3	Notification of User Plane Management Events .....	106
4.3.6.4	Transferring an AF request targeting an individual UE address to the relevant PCF.....	108
4.3.7	CN-initiated selective deactivation of UP connection of an existing PDU Session.....	109
4.4	SMF and UPF interactions .....	110
4.4.1	N4 session management procedures .....	110
4.4.1.1	General .....	110
4.4.1.2	N4 Session Establishment procedure .....	110
4.4.1.3	N4 Session Modification procedure .....	111
4.4.1.4	N4 Session Release procedure .....	112
4.4.2	N4 Reporting Procedures.....	112
4.4.2.1	General .....	112
4.4.2.2	N4 Session Level Reporting Procedure.....	112
4.4.3	N4 Node Level Procedures .....	113
4.4.3.1	N4 Association Setup Procedure.....	113
4.4.3.2	N4 Association Update Procedure .....	114
4.4.3.3	N4 Association Release Procedure .....	114
4.4.3.4	N4 Report Procedure.....	115
4.4.3.5	N4 PFD management Procedure .....	115
4.4.4	SMF Pause of Charging procedure .....	116
4.5	User Profile management procedures.....	117
4.5.1	Subscriber Data Update Notification to AMF .....	117
4.5.2	Session Management Subscriber Data Update Notification to SMF .....	118
4.5.3	Purge of subscriber data in AMF .....	118
4.6	Security procedures .....	119
4.7	ME Identity check procedure .....	119
4.8	RAN-CN interactions .....	119
4.8.1	Connection Inactive procedure .....	119
4.8.2	Connection Resume procedure .....	119
4.8.3	N2 Notification procedure .....	120
4.9	Handover procedures.....	121
4.9.1	Handover procedures in 3GPP access.....	121
4.9.1.1	General .....	121
4.9.1.2	Xn based inter NG-RAN handover .....	121
4.9.1.2.1	General .....	121
4.9.1.2.2	Xn based inter NG-RAN handover without User Plane function re-allocation.....	121
4.9.1.2.3	Xn based inter NG-RAN handover with insertion of intermediate UPF .....	124
4.9.1.2.4	Xn based inter NG-RAN handover with re-allocation of intermediate UPF .....	126
4.9.1.3	Inter NG-RAN node N2 based handover .....	127

4.9.1.3.1	General .....	127
4.9.1.3.2	Preparation phase.....	129
4.9.1.3.3	Execution phase.....	134
4.9.1.4	Inter NG-RAN node N2 based handover, Cancel .....	137
4.9.2	Handover of a PDU Session procedure between 3GPP and untrusted non-3GPP access .....	138
4.9.2.1	Handover of a PDU Session procedure from untrusted non-3GPP to 3GPP access (non-roaming and roaming with local breakout).....	138
4.9.2.2	Handover of a PDU Session procedure from 3GPP to untrusted non-3GPP access (non-roaming and roaming with local breakout).....	138
4.9.2.3	Handover of a PDU Session procedure from untrusted non-3GPP to 3GPP access (home routed roaming).....	139
4.9.2.3.1	The target AMF is in the PLMN of the N3IWF .....	139
4.9.2.3.2	The target AMF is not in the PLMN of the N3IWF (i.e. N3IWF in HPLMN).....	140
4.9.2.4	Handover of a PDU Session procedure from 3GPP to untrusted non-3GPP access (home routed roaming).....	140
4.9.2.4.1	The selected N3IWF is in the registered PLMN.....	140
4.9.2.4.2	The UE is roaming and the selected N3IWF is in the home PLMN.....	141
4.10	NG-RAN Location reporting procedures .....	142
4.11	System interworking procedures with EPC.....	143
4.11.0	General.....	143
4.11.0a	Impacts to EPS Procedures .....	143
4.11.0a.1	General .....	143
4.11.0a.2	Interaction with PCC.....	143
4.11.0a.3	Mobility Restrictions.....	144
4.11.0a.4	PGW Selection.....	144
4.11.0a.5	PDN Connection Establishment.....	144
4.11.1	N26 based Interworking Procedures .....	144
4.11.1.1	General .....	144
4.11.1.2	Handover procedures .....	146
4.11.1.2.1	5GS to EPS handover using N26 interface.....	146
4.11.1.2.2	EPS to 5GS handover using N26 interface.....	150
4.11.1.2.3	Handover Cancel .....	156
4.11.1.3	Idle Mode Mobility procedures.....	157
4.11.1.3.1	General .....	157
4.11.1.3.2	5GS to EPS Idle mode mobility using N26 interface .....	157
4.11.1.3.3	EPS to 5GS Mobility Registration Procedure (Idle and Connected State) using N26 interface ...	160
4.11.1.4	Procedures for EPS bearer ID allocation.....	164
4.11.1.4.1	EPS bearer ID allocation .....	164
4.11.1.4.2	EPS bearer ID transfer.....	167
4.11.1.4.3	EPS bearer ID revocation .....	168
4.11.1.5	Impacts to EPS Procedures .....	169
4.11.1.5.1	General .....	169
4.11.1.5.2	E-UTRAN Initial Attach .....	169
4.11.1.5.3	Tracking Area Update .....	170
4.11.1.5.4	Session Management .....	170
4.11.1.5.5	5GS to EPS handover using N26 interface.....	172
4.11.1.6	EPS interworking information storing Procedure .....	173
4.11.2	Interworking procedures without N26 interface .....	173
4.11.2.1	General .....	173
4.11.2.2	5GS to EPS Mobility.....	173
4.11.2.3	EPS to 5GS Mobility.....	176
4.11.2.4	Impacts to EPS Procedures .....	178
4.11.2.4.1	E-UTRAN Attach.....	178
4.11.2.4.2	Session Management .....	180
4.11.2.4.3	Initial Attach on S2b.....	180
4.11.3	Handover procedures between EPS and 5GC-N3IWF .....	181
4.11.3.1	Handover from EPS to 5GC-N3IWF .....	181
4.11.3.2	Handover from 5GC-N3IWF to EPS .....	181
4.11.4	Handover procedures between EPC/ePDG and 5GS .....	182
4.11.4.1	Handover from EPC/ePDG to 5GS .....	182
4.11.4.2	Handover from 5GS to EPC/ePDG.....	183
4.11.5	Impacts to 5GC Procedures .....	184

4.11.5.1	General .....	184
4.11.5.2	Registration procedure .....	184
4.11.5.3	UE Requested PDU Session Establishment procedure .....	184
4.11.5.4	UE or Network Requested PDU Session Modification procedure .....	185
4.11.5.5	Xn based inter NG-RAN handover .....	185
4.11.5.6	Inter NG-RAN node N2 based handover .....	185
4.12	Procedures for non-3GPP access .....	185
4.12.1	General .....	185
4.12.2	Registration via Untrusted non-3GPP Access .....	185
4.12.2.1	General .....	185
4.12.2.2	Registration procedure for untrusted non-3GPP access .....	186
4.12.2.3	Emergency Registration for untrusted non-3GPP Access .....	188
4.12.3	Deregistration procedure for untrusted non-3gpp access .....	189
4.12.4	N2 procedures via Untrusted non-3GPP Access .....	190
4.12.4.1	Service Request procedures via Untrusted non-3GPP Access .....	190
4.12.4.2	Procedure for the UE context release in the N3IWF .....	190
4.12.4.3	CN-initiated selective deactivation of UP connection of an existing PDU Session associated with Untrusted non-3GPP Access .....	192
4.12.5	UE Requested PDU Session Establishment via Untrusted non-3GPP Access .....	192
4.12.6	UE or Network Requested PDU Session Modification via Untrusted non-3GPP access .....	194
4.12.7	UE or network Requested PDU Session Release via Untrusted non-3GPP access .....	195
4.12.8	Mobility from a non-geographically selected AMF to a geographically selected AMF .....	197
4.13	Specific services .....	198
4.13.1	General .....	198
4.13.2	Application Triggering .....	198
4.13.2.1	General .....	198
4.13.2.2	The procedure of "Application Triggering" Service .....	199
4.13.3	SMS over NAS procedures .....	201
4.13.3.1	Registration procedures for SMS over NAS .....	201
4.13.3.2	Deregistration procedures for SMS over NAS .....	202
4.13.3.3	MO SMS over NAS in CM-IDLE (baseline) .....	203
4.13.3.4	Void .....	204
4.13.3.5	MO SMS over NAS in CM-CONNECTED .....	204
4.13.3.6	MT SMS over NAS in CM-IDLE state via 3GPP access .....	204
4.13.3.7	MT SMS over NAS in CM-CONNECTED state via 3GPP access .....	205
4.13.3.8	MT SMS over NAS via non-3GPP access .....	205
4.13.3.9	Unsuccessful Mobile terminating SMS delivery attempt .....	206
4.13.4	Emergency Services .....	206
4.13.4.1	General .....	206
4.13.4.2	Emergency Services Fallback .....	206
4.13.5	Location Services procedures .....	208
4.13.5.1	5GC-NI-LR Procedure .....	208
4.13.5.2	5GC-MT-LR Procedure without UDM Query .....	209
4.13.5.3	5GC-MT-LR Procedure .....	210
4.13.5.4	UE Assisted and UE Based Positioning Procedure .....	211
4.13.5.5	Network Assisted Positioning Procedure .....	212
4.13.5.6	Obtaining Non-UE Associated Network Assistance Data .....	213
4.13.5.7	Location continuity for Handover of an Emergency session from NG-RAN .....	213
4.13.6	Support of IMS Voice .....	215
4.13.6.1	EPS fallback for IMS voice .....	215
4.13.6.2	Inter RAT Fallback in 5GC for IMS voice .....	217
4.14	Support for Dual Connectivity .....	218
4.14.1	RAN Initiated QoS Flow Mobility .....	218
4.15	Network Exposure .....	220
4.15.1	General .....	220
4.15.2	External Exposure of Network Capabilities .....	221
4.15.3	Event Exposure using NEF .....	221
4.15.3.1	Monitoring Events .....	221
4.15.3.2	Information flows .....	223
4.15.3.2.1	AMF service operations information flow .....	223
4.15.3.2.2	UDM service operations information flow .....	223
4.15.3.2.3	NEF service operations information flow .....	225

4.15.3.2.4	Exposure with bulk subscription .....	227
4.15.4	Core Network Internal Event Exposure .....	228
4.15.4.1	General .....	228
4.15.4.2	Exposure of Mobility Events from AMF .....	228
4.15.5	Void .....	229
4.15.6	External Parameter Provisioning .....	229
4.15.6.1	General .....	229
4.15.6.2	NEF service operations information flow .....	229
4.15.6.3	Expected UE Behaviour parameters.....	230
4.15.6.4	Set a chargeable party at AF session setup.....	231
4.15.6.5	Change the chargeable party during the session.....	232
4.15.6.6	Setting up an AF session with required QoS procedure.....	233
4.16	Procedures and flows for Policy Framework .....	234
4.16.1	AM Policy Association Establishment .....	234
4.16.1.1	General .....	234
4.16.1.2	AM Policy Association Establishment with new Selected PCF.....	234
4.16.1.3	Void.....	235
4.16.2	AM Policy Association Modification .....	235
4.16.2.0	General .....	235
4.16.2.1	AM Policy Association Modification initiated by the AMF .....	235
4.16.2.1.1	AM Policy Association Modification initiated by the AMF without AMF relocation .....	235
4.16.2.1.2	AM Policy Association Modification with old PCF during AMF relocation .....	236
4.16.2.2	AM Policy Association Modification initiated by the PCF.....	237
4.16.3	AM Policy Association Termination .....	237
4.16.3.1	General .....	237
4.16.3.2	AMF-initiated AM Policy Association Termination.....	238
4.16.3.3	Void.....	238
4.16.4	SM Policy Association Establishment .....	239
4.16.5	SM Policy Association Modification .....	240
4.16.5.0	General .....	240
4.16.5.1	SMF initiated SM Policy Association Modification .....	240
4.16.5.2	PCF initiated SM Policy Association Modification .....	241
4.16.6	SM Policy Association Termination .....	242
4.16.7	Negotiations for future background data transfer .....	243
4.16.7.1	General .....	243
4.16.7.2	Procedures for future background data transfer .....	244
4.16.8	Procedures on interaction between PCF and CHF .....	245
4.16.8.1	General .....	245
4.16.8.2	Initial Spending Limit Retrieval.....	245
4.16.8.3	Intermediate Spending Limit Report Retrieval .....	246
4.16.8.4	Final Spending Limit Report Retrieval .....	246
4.16.8.5	Spending Limit Report.....	247
4.16.8.6	CHF report the removal of the subscriber .....	247
4.16.9	Update of the subscription information in the PCF .....	248
4.16.10	Void .....	249
4.16.11	UE Policy Association Establishment .....	249
4.16.12	UE Policy Association Modification .....	251
4.16.12.1	UE Policy Association Modification initiated by the AMF .....	251
4.16.12.1.1	UE Policy Association Modification initiated by the AMF without AMF relocation .....	251
4.16.12.1.2	UE Policy Association Modification with old PCF during AMF relocation.....	253
4.16.12.2	UE Policy Association Modification initiated by the PCF.....	254
4.16.13	UE Policy Association Termination .....	255
4.16.13.1	AMF-initiated UE Policy Association Termination.....	255
4.16.13.2	PCF-initiated UE Policy Association Termination .....	256
4.17	Network Function Service Framework Procedure .....	257
4.17.1	NF service Registration .....	257
4.17.2	NF service update .....	258
4.17.3	NF service deregistration .....	258
4.17.4	NF/NF service discovery in the same PLMN .....	259
4.17.5	NF/NF service discovery across PLMNs.....	260
4.17.6	SMF Provisioning of available UPFs using the NRF .....	260
4.17.6.1	General .....	260



4.17.6.2	SMF provisioning of UPF instances using NRF .....	261
4.17.7	NF/NF service status subscribe/notify in the same PLMN .....	262
4.17.8	NF/NF service status subscribe/notify across PLMNs.....	262
4.18	Procedures for Management of PFDs.....	263
4.18.1	General.....	263
4.18.2	PFD management via NEF (PFDF) .....	264
4.18.3	PFD management in the SMF.....	264
4.18.3.1	PFD Retrieval by the SMF.....	264
4.18.3.2	Management of PFDs in the SMF.....	265
4.19	Network Data Analytics .....	266
4.19.1	Network data analytics Subscribe/Unsubscribe .....	266
4.19.2	Network data analytics Request.....	266
4.20	UE Parameters Update via UDM Control Plane Procedure .....	267
4.20.1	General.....	267
4.20.2	UE Parameters Update via UDM Control Plane Procedure.....	267
4.20.3	Void.....	268
4.21	Secondary RAT Usage Data Reporting Procedure.....	268
5	Network Function Service procedures .....	269
5.1	Network Function Service framework procedures .....	269
5.1.1	Network Function Service Discovery .....	269
5.2	Network Function services .....	269
5.2.1	General.....	269
5.2.2	AMF Services .....	269
5.2.2.1	General .....	269
5.2.2.2	Namf_Communication service.....	270
5.2.2.2.1	General .....	270
5.2.2.2.2	Namf_Communication_UEContextTransfer service operation.....	270
5.2.2.2.3	Namf_Communication_RegistrationCompleteNotify service operation.....	274
5.2.2.2.4	Namf_Communication_N1MessageNotify service operation.....	275
5.2.2.2.5	Namf_Communication_N1MessageSubscribe service operation.....	275
5.2.2.2.6	Namf_Communication_N1MessageUnSubscribe service operation.....	275
5.2.2.2.7	Namf_Communication_N1N2MessageTransfer service operation.....	276
5.2.2.2.7A	Namf_Communication_N1N2TransferFailureNotification service operation.....	277
5.2.2.2.8	Namf_Communication_N2InfoSubscribe service operation.....	277
5.2.2.2.9	Namf_Communication_N2InfoUnsubscribe service operation.....	277
5.2.2.2.10	Namf_Communication_N2InfoNotify service operation .....	277
5.2.2.2.11	Namf_Communication_CreateUEContext service operation.....	278
5.2.2.2.12	Namf_Communication_ReleaseUEContext service operation.....	278
5.2.2.2.13	Namf_Communication_EBIAssignment service operation.....	278
5.2.2.2.14	Namf_Communication_AMFStatusChangeSubscribe service operation.....	278
5.2.2.2.15	Namf_Communication_AMFStatusChangeUnSubscribe service operation .....	279
5.2.2.2.16	Namf_Communication_AMFStatusChangeNotify service operation .....	279
5.2.2.3	Namf_EventExposure service .....	279
5.2.2.3.1	General .....	279
5.2.2.3.2	Namf_EventExposure_Subscribe service operation.....	280
5.2.2.3.3	Namf_EventExposure_UnSubscribe service operation .....	281
5.2.2.3.4	Namf_EventExposure_Notify service operation .....	281
5.2.2.4	Namf_MT service .....	281
5.2.2.4.1	General .....	281
5.2.2.4.2	Namf_MT_EnableUERachability service operation .....	282
5.2.2.4.3	Namf_MT_ProvideDomainSelectionInfo .....	282
5.2.2.5	Namf_Location service .....	282
5.2.2.5.1	General .....	282
5.2.2.5.2	Namf_Location_ProvidePositioningInfo service operation.....	282
5.2.2.5.3	Namf_Location_EventNotify service operation.....	283
5.2.2.5.4	Namf_Location_ProvideLocationInfo service operation .....	283
5.2.3	UDM Services .....	283
5.2.3.1	General .....	283
5.2.3.2	Nudm_UECM (UECM) service.....	284
5.2.3.2.1	Nudm_UECM_Registration service operation.....	284
5.2.3.2.2	Nudm_UECM_DeregistrationNotification service operation .....	284

5.2.3.2.3	Nudm_UECM_Deregistration service operation.....	285
5.2.3.2.4	Nudm_UECM_Get service operation.....	285
5.2.3.2.5	Nudm_UECM_Update service operation.....	285
5.2.3.2.6	Nudm_UECM_PCscfRestoration service operation.....	286
5.2.3.3	Nudm_SubscriberDataManagement (SDM) Service .....	286
5.2.3.3.1	General .....	286
5.2.3.3.2	Nudm_SDM_Get service operation .....	291
5.2.3.3.3	Nudm_SDM_Notification service operation.....	291
5.2.3.3.4	Nudm_SDM_Subscribe service operation .....	292
5.2.3.3.5	Nudm_SDM_Unsubscribe service operation .....	292
5.2.3.3.6	Nudm_SDM_Info service operation.....	292
5.2.3.4	Nudm_UEAuthentication Service.....	293
5.2.3.4.1	General .....	293
5.2.3.4.2	Nudm_UEAuthentication_Get service operation .....	293
5.2.3.4.3	Nudm_UEAuthentication_ResultConfirmation service operation .....	293
5.2.3.5	Nudm_EventExposure service .....	293
5.2.3.5.1	General .....	293
5.2.3.5.2	Nudm_EventExposure_Subscribe service operation.....	293
5.2.3.5.3	Nudm_EventExposure_Unsubscribe service operation.....	293
5.2.3.5.4	Nudm_EventExposure_Notify service operation .....	294
5.2.3.6	Nudm_ParameterProvision service .....	294
5.2.3.6.1	General .....	294
5.2.3.6.2	Nudm_ParameterProvision_Update service operation .....	294
5.2.4	5G-EIR Services .....	294
5.2.4.1	General .....	294
5.2.4.2	N5g-eir_EquipmentIdentityCheck service.....	294
5.2.4.2.1	General .....	294
5.2.4.2.2	N5g-eir_EquipmentIdentityCheck_Get service operation.....	294
5.2.5	PCF Services.....	295
5.2.5.1	General .....	295
5.2.5.2	Npcf_AMPolicyControl service.....	295
5.2.5.2.1	General .....	295
5.2.5.2.2	Npcf_AMPolicyControl_Create service operation.....	296
5.2.5.2.3	Npcf_AMPolicyControl_UpdateNotify service operation .....	296
5.2.5.2.4	Npcf_AMPolicyControl_Delete service operation.....	296
5.2.5.2.5	Npcf_AMPolicyControl_Update service operation.....	297
5.2.5.3	Npcf_PolicyAuthorization Service .....	297
5.2.5.3.1	General .....	297
5.2.5.3.2	Npcf_PolicyAuthorization_Create service operation .....	297
5.2.5.3.3	Npcf_PolicyAuthorization_Update service operation .....	297
5.2.5.3.4	Npcf_PolicyAuthorization_Delete service operation .....	298
5.2.5.3.5	Npcf_PolicyAuthorization_Notify service operation .....	298
5.2.5.3.6	Npcf_PolicyAuthorization_Subscribe service operation.....	298
5.2.5.3.7	Npcf_PolicyAuthorization_Unsubscribe service operation.....	299
5.2.5.4	Npcf_SMPolicyControl service .....	299
5.2.5.4.1	General .....	299
5.2.5.4.2	Npcf_SMPolicyControl_Create service operation .....	299
5.2.5.4.3	Npcf_SMPolicyControl_UpdateNotify service operation.....	300
5.2.5.4.4	Npcf_SMPolicyControl_Delete service operation .....	300
5.2.5.4.5	Npcf_SMPolicyControl_Update service operation .....	300
5.2.5.5	Npcf_BDTPolicyControl Service .....	301
5.2.5.5.1	General .....	301
5.2.5.5.2	Npcf_BDTPolicyControl_Create service operation .....	301
5.2.5.5.3	Npcf_BDTPolicyControl_Update service operation.....	301
5.2.5.6	Npcf_UEPolicyControl Service .....	301
5.2.5.6.1	General .....	301
5.2.5.6.2	Npcf_UEPolicyControl_Create service operation.....	302
5.2.5.6.3	Npcf_UEPolicyControl_UpdateNotify service operation .....	302
5.2.5.6.4	Npcf_UEPolicyControl_Delete service operation.....	302
5.2.5.6.5	Npcf_UEPolicyControl_Update service operation.....	303
5.2.5.7	Npcf_EventExposure service .....	303
5.2.5.7.1	General .....	303

5.2.5.7.2	Npcf_EventExposure_Subscribe service operation.....	303
5.2.5.7.3	Npcf_EventExposure_Unsubscribe service operation.....	304
5.2.5.7.4	Npcf_EventExposure_Notify service operation .....	304
5.2.6	NEF Services .....	304
5.2.6.1	General .....	304
5.2.6.2	Nnef_EventExposure service .....	305
5.2.6.2.1	General .....	305
5.2.6.2.2	Nnef_EventExposure_Subscribe operation.....	305
5.2.6.2.3	Nnef_EventExposure_Unsubscribe service operation.....	305
5.2.6.2.4	Nnef_EventExposure_Notify service operation .....	306
5.2.6.3	Nnef_PFDManagement service .....	306
5.2.6.3.1	General .....	306
5.2.6.3.2	Nnef_PFDManagement_Fetch service operation.....	306
5.2.6.3.3	Nnef_PFDManagement_Subscribe service operation.....	306
5.2.6.3.4	Nnef_PFDManagement_Notify service operation .....	306
5.2.6.3.5	Nnef_PFDManagement_Unsubscribe service operation.....	307
5.2.6.3.6	Nnef_PFDManagement_Create service operation .....	307
5.2.6.3.7	Nnef_PFDManagement_Update service operation .....	307
5.2.6.3.8	Nnef_PFDManagement_Delete service operation .....	307
5.2.6.4	Nnef_ParameterProvision service .....	307
5.2.6.4.1	General .....	307
5.2.6.4.2	Nnef_ParameterProvision_Update service operation.....	307
5.2.6.5	Nnef_Trigger service .....	308
5.2.6.5.1	General .....	308
5.2.6.5.2	Nnef_Trigger_Delivery service operation.....	308
5.2.6.5.3	Nnef_Trigger_DeliveryNotify service operation.....	308
5.2.6.6	Nnef_BDTPNegotiation service .....	308
5.2.6.6.1	General .....	308
5.2.6.6.2	Nnef_BDTPNegotiation_Create service operation.....	308
5.2.6.6.3	Nnef_BDTPNegotiation_Update service operation.....	308
5.2.6.7	Nnef_TrafficInfluence service .....	309
5.2.6.7.1	General .....	309
5.2.6.7.2	Nnef_TrafficInfluence_Create operation.....	309
5.2.6.7.3	Nnef_TrafficInfluence_Update operation.....	309
5.2.6.7.4	Nnef_TrafficInfluence_Delete operation.....	309
5.2.6.7.5	Nnef_TrafficInfluence_Notify operation.....	310
5.2.6.8	Nnef_ChargeableParty service.....	310
5.2.6.8.1	General .....	310
5.2.6.8.2	Nnef_ChargeableParty_Create service operation.....	310
5.2.6.8.3	Nnef_ChargeableParty_Update service operation.....	310
5.2.6.8.4	Nnef_ChargeableParty_Notify service operation.....	310
5.2.6.9	Nnef_AFsessionWithQoS service.....	311
5.2.6.9.1	General .....	311
5.2.6.9.2	Nnef_AFsessionWithQoS_Create service operation.....	311
5.2.6.9.3	Nnef_AFsessionWithQoS_Notify service operation.....	311
5.2.7	NRF Services .....	311
5.2.7.1	General .....	311
5.2.7.2	Nnrf_NFManagement service .....	312
5.2.7.2.1	General .....	312
5.2.7.2.2	Nnrf_NFManagement_NFRegister service operation.....	312
5.2.7.2.3	Nnrf_NFManagement_NFUpdate service operation.....	313
5.2.7.2.4	Nnrf_NFManagement_NFDeregister service operation.....	313
5.2.7.2.5	Nnrf_NFManagement_NFStatusSubscribe service operation.....	313
5.2.7.2.6	Nnrf_NFManagement_NFStatusNotify service operation .....	314
5.2.7.2.7	Nnrf_NFManagement_NFStatusUnsubscribe service operation.....	314
5.2.7.3	Nnrf_NFDiscovery service .....	314
5.2.7.3.1	General .....	314
5.2.7.3.2	Nnrf_NFDiscovery_Request service operation.....	315
5.2.7.4	Nnrf_AccessToken_service .....	316
5.2.7.4.1	General .....	316
5.2.7.4.2	Nnrf_AccessToken_Get Service Operation.....	316
5.2.8	SMF Services.....	316

5.2.8.1	General .....	316
5.2.8.2	Nsmf_PDUSession Service .....	316
5.2.8.2.1	General .....	316
5.2.8.2.2	Nsmf_PDUSession_Create service operation .....	317
5.2.8.2.3	Nsmf_PDUSession_Update service operation .....	318
5.2.8.2.4	Nsmf_PDUSession_Release service operation .....	318
5.2.8.2.5	Nsmf_PDUSession_CreateSMContext service operation .....	318
5.2.8.2.6	Nsmf_PDUSession_UpdateSMContext service operation .....	319
5.2.8.2.7	Nsmf_PDUSession_ReleaseSMContext service operation .....	320
5.2.8.2.8	Nsmf_PDUSession_SMContextStatusNotify service operation .....	320
5.2.8.2.9	Nsmf_PDUSession_StatusNotify service operation .....	320
5.2.8.2.10	Nsmf_PDUSession_ContextRequest service operation .....	320
5.2.8.3	Nsmf_EventExposure Service .....	321
5.2.8.3.1	General .....	321
5.2.8.3.2	Nsmf_EventExposure_Notify service operation .....	322
5.2.8.3.3	Nsmf_EventExposure_Subscribe service operation .....	322
5.2.8.3.4	Nsmf_EventExposure_UnSubscribe service operation .....	322
5.2.9	SMSF Services .....	323
5.2.9.1	General .....	323
5.2.9.2	Nsmsf_SMSservice service .....	323
5.2.9.2.1	General .....	323
5.2.9.2.2	Nsmsf_SMSservice_Activate service operation .....	323
5.2.9.2.3	Nsmsf_SMSservice_Deactivate service operation .....	323
5.2.9.2.4	Nsmsf_SMSservice_UplinkSMS service operation .....	323
5.2.10	AUSF Services .....	324
5.2.10.1	General .....	324
5.2.10.2	Nausf_UEAuthentication service .....	324
5.2.10.2.1	General .....	324
5.2.10.2.2	Nausf_UEAuthentication_Authenticate service operation .....	324
5.2.10.2.3	Void .....	324
5.2.10.3	Nausf_SoRProtection service .....	324
5.2.10.3.1	General .....	324
5.2.10.3.2	Nausf_SoRProtection_Protect service operation .....	324
5.2.11	NWDAF Services .....	324
5.2.11.1	General .....	324
5.2.11.2	Nnwdaf_EventsSubscription Service .....	325
5.2.11.2.1	General .....	325
5.2.11.2.2	Nnwdaf_EventsSubscription_Subscribe service operation .....	325
5.2.11.2.3	Nnwdaf_EventsSubscription_Unsubscribe service operation .....	325
5.2.11.2.4	Nnwdaf_EventsSubscription_Notify service operation .....	326
5.2.11.3	Nnwdaf_Analytics_Info service .....	326
5.2.11.3.1	General .....	326
5.2.11.3.2	Nnwdaf_AnalyticsInfo_Request service operation .....	326
5.2.12	UDR Services .....	326
5.2.12.1	General .....	326
5.2.12.2	Nudr_DataManagement (DM) service .....	328
5.2.12.2.1	General .....	328
5.2.12.2.2	Nudr_DM_Query service operation .....	329
5.2.12.2.3	Nudr_DM_Create service operation .....	330
5.2.12.2.4	Nudr_DM_Delete service operation .....	330
5.2.12.2.5	Nudr_DM_Update service operation .....	330
5.2.12.2.6	Nudr_DM_Subscribe service operation .....	330
5.2.12.2.7	Nudr_DM_Unsubscribe service operation .....	331
5.2.12.2.8	Nudr_DM_Notify service operation .....	331
5.2.13	BSF Services .....	331
5.2.13.1	General .....	331
5.2.13.2	Nbsf_Management service .....	331
5.2.13.2.1	General .....	331
5.2.13.2.2	Nbsf_Management_Register service operation .....	332
5.2.13.2.3	Nbsf_Management_Deregister service operation .....	332
5.2.13.2.4	Nbsf_Management_Discovery service operation .....	332
5.2.14	UDSF Services .....	332

5.2.14.1	General .....	332
5.2.14.2	Nudsf_UnstructuredDataManagement service.....	333
5.2.14.2.1	General .....	333
5.2.14.2.2	Nudsf_UnstructuredDataManagement_Query service operation .....	333
5.2.14.2.3	Nudsf_UnstructuredDataManagement_Create service operation.....	333
5.2.14.2.4	Nudsf_UnstructuredDataManagement_Delete service operation.....	333
5.2.14.2.5	Nudsf_UnstructuredDataManagement_Update service operation.....	333
5.2.15	LMF Services.....	334
5.2.15.1	General .....	334
5.2.15.2	Nlmf_Location service.....	334
5.2.15.2.1	General .....	334
5.2.15.2.2	Nlmf_Location_DetermineLocation service operation .....	334
5.2.16	NSSF Services .....	334
5.2.16.1	General .....	334
5.2.16.2	Nnssf_NSSelection service .....	335
5.2.16.2.1	Nnssf_NSSelection_Get service operation.....	335
5.2.16.3	Nnssf_NSSAIAvailability service.....	336
5.2.16.3.1	General .....	336
5.2.16.3.2	Nnssf_NSSAIAvailability_Update service operation.....	336
5.2.16.3.3	Nnssf_NSSAIAvailability_Notify service operation.....	337
5.2.16.3.4	Nnssf_NSSAIAvailability_Subscribe service operation .....	337
5.2.16.3.5	Nnssf_NSSAIAvailability_Unsubscribe service operation .....	337
5.2.16.3.6	Nnssf_NSSAIAvailability_Delete service operation.....	337
5.2.17	CHF Spending Limit Control Service.....	338
5.2.17.1	General .....	338
5.2.17.2	Nchf_SpendingLimitControl service .....	338
5.2.17.2.1	General .....	338
5.2.17.2.2	Nchf_SpendingLimitControl Subscribe service operation.....	338
5.2.17.2.3	Nchf_SpendingLimitControl Unsubscribe service operation .....	338
5.2.17.2.4	Nchf_SpendingLimitControl Notify service operation .....	338
<b>Annex A (informative):</b>	<b>Drafting rules and conventions for NF services .....</b>	<b>340</b>
A.1	General .....	340
A.2	Naming.....	340
A.2.1	Service naming.....	340
A.2.2	Service operation naming.....	340
A.3	Representation in an information flow.....	341
A.4	Reference to services and service operations in procedures.....	342
A.5	Service and service operation description template .....	342
A.6	Design Guidelines for NF services.....	342
A.6.1	Self-Containment .....	342
A.6.2	Reusability.....	343
A.6.3	Use Independent Management Schemes .....	343
<b>Annex B (informative):</b>	<b>Drafting Rules for Information flows .....</b>	<b>344</b>
<b>Annex C (informative):</b>	<b>Generating EPS PDN Connection parameters from 5G PDU Session parameters.....</b>	<b>345</b>
<b>Annex D (normative):</b>	<b>UE Presence in Area of Interest .....</b>	<b>346</b>
D.1	Determination of UE presence in Area of Interest by AMF.....	346
D.2	Determination of UE presence in Area of Interest by NG-RAN.....	346
<b>Annex D (informative):</b>	<b>Change history .....</b>	<b>348</b>
History .....		361