

ETSI TS 136 413 V15.6.0 (2019-07)



LTE;
Evolved Universal Terrestrial
Radio Access Network (E-UTRAN);
S1 Application Protocol (S1AP)
(3GPP TS 36.413 version 15.6.0 Release 15)

<https://standards.iteh.ai/catalog/standards/si/11bb9fd5d-fb90-4ea9-8d8e-b0601749b311/etsi-ts-136-413-v15-6-0-2019-07>



ReferenceRTS/TSGR-0336413vf60

KeywordsLTE

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.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

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 2019.

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.....	14
1 Scope	15
2 References	15
3 Definitions and abbreviations.....	18
3.1 Definitions	18
3.2 Abbreviations	19
4 General	20
4.1 Procedure Specification Principles.....	20
4.2 Forwards and Backwards Compatibility	21
4.3 Specification Notations	21
5 S1AP Services	22
6 Services Expected from Signalling Transport.....	23
7 Functions of S1AP	24
8 S1AP Procedures	26
8.1 List of S1AP Elementary procedures	26
8.2 E-RAB Management procedures.....	28
8.2.1 E-RAB Setup	28
8.2.1.1 General	28
8.2.1.2 Successful Operation.....	28
8.2.1.3 Unsuccessful Operation	29
8.2.1.4 Abnormal Conditions	30
8.2.2 E-RAB Modify	30
8.2.2.1 General	30
8.2.2.2 Successful Operation.....	30
8.2.2.3 Unsuccessful Operation	31
8.2.2.4 Abnormal Conditions	31
8.2.3 E-RAB Release	32
8.2.3.1 General	32
8.2.3.2 Successful Operation.....	32
8.2.3.2.1 E-RAB Release – MME initiated	32
8.2.3.2.2 E-RAB Release Indication – eNB initiated	33
8.2.3.3 Abnormal Conditions	33
8.2.4 E-RAB Modification Indication	34
8.2.4.1 General	34
8.2.4.2 Successful Operation.....	34
8.2.4.3 Unsuccessful Operation	35
8.2.4.4 Abnormal Conditions	35
8.3 Context Management procedures	35
8.3.1 Initial Context Setup	35
8.3.1.1 General	35
8.3.1.2 Successful Operation.....	35
8.3.1.3 Unsuccessful Operation	39
8.3.1.4 Abnormal Conditions	39
8.3.2 UE Context Release Request (eNB initiated)	40
8.3.2.1 General	40
8.3.2.2 Successful Operation.....	40
8.3.3 UE Context Release (MME initiated).....	41
8.3.3.1 General	41

8.3.3.2	Successful Operation.....	41
8.3.3.3	Abnormal Conditions	42
8.3.4	UE Context Modification.....	42
8.3.4.1	General	42
8.3.4.2	Successful Operation.....	42
8.3.4.3	Unsuccessful Operation	44
8.3.4.4	Abnormal Conditions	44
8.3.5	UE Radio Capability Match.....	44
8.3.5.1	General	44
8.3.5.2	Successful Operation.....	45
8.3.5.3	Unsuccessful Operation	45
8.3.5.4	Abnormal Conditions	45
8.3.6	UE Context Modification Indication	45
8.3.6.1	General	45
8.3.6.2	Successful Operation.....	46
8.3.6.3	Unsuccessful Operation	46
8.3.6.4	Abnormal Conditions	46
8.3.7	UE Context Suspend	46
8.3.7.1	General	46
8.3.7.2	Successful Operation.....	46
8.3.8	UE Context Resume.....	47
8.3.8.1	General	47
8.3.8.2	Successful Operation.....	47
8.3.8.3	Unsuccessful Operation	48
8.3.9	Connection Establishment Indication	48
8.3.9.1	General	48
8.3.9.2	Successful Operation.....	48
8.3.9.3	Unsuccessful Operation	49
8.3.9.4	Abnormal Conditions	49
8.3.10	Retrieve UE Information	49
8.3.10.1	General	49
8.3.10.2	Successful Operation.....	49
8.3.10.3	Unsuccessful Operation	49
8.3.10.4	Abnormal Conditions	49
8.3.11	UE Information Transfer	50
8.3.11.1	General	50
8.3.11.2	Successful Operation.....	50
8.3.11.3	Unsuccessful Operation	50
8.3.11.4	Abnormal Conditions	50
8.3.12	eNB CP Relocation Indication.....	50
8.3.12.1	General	50
8.3.12.2	Successful Operation.....	51
8.3.12.3	Unsuccessful Operation	51
8.3.12.4	Abnormal Conditions	51
8.3.13	MME CP Relocation Indication.....	51
8.3.13.1	General	51
8.3.13.2	Successful Operation.....	51
8.3.13.3	Unsuccessful Operation	52
8.3.13.4	Abnormal Conditions	52
8.4	Handover Signalling.....	52
8.4.1	Handover Preparation	52
8.4.1.1	General	52
8.4.1.2	Successful Operation.....	52
8.4.1.3	Unsuccessful Operation	55
8.4.1.4	Abnormal Conditions	56
8.4.2	Handover Resource Allocation.....	56
8.4.2.1	General	56
8.4.2.2	Successful Operation.....	56
8.4.2.3	Unsuccessful Operation	60
8.4.2.4	Abnormal Conditions	60
8.4.3	Handover Notification	61
8.4.3.1	General	61

8.4.3.2	Successful Operation.....	61
8.4.3.3	Abnormal Conditions	61
8.4.4	Path Switch Request	61
8.4.4.1	General	61
8.4.4.2	Successful Operation.....	61
8.4.4.3	Unsuccessful Operation	64
8.4.4.4	Abnormal Conditions	64
8.4.5	Handover Cancellation	64
8.4.5.1	General	64
8.4.5.2	Successful Operation.....	64
8.4.5.3	Unsuccessful Operation	65
8.4.5.4	Abnormal Conditions	65
8.4.6	eNB Status Transfer.....	65
8.4.6.1	General	65
8.4.6.2	Successful Operation.....	65
8.4.6.3	Unsuccessful Operation	66
8.4.6.4	Abnormal Conditions	66
8.4.7	MME Status Transfer.....	66
8.4.7.1	General	66
8.4.7.2	Successful Operation.....	66
8.4.7.3	Unsuccessful Operation	66
8.4.7.4	Abnormal Conditions	67
8.5	Paging.....	67
8.5.1	General.....	67
8.5.2	Successful Operation	67
8.5.3	Unsuccessful Operation	68
8.5.4	Abnormal Conditions.....	68
8.6	NAS transport.....	68
8.6.1	General.....	68
8.6.2	Successful Operations	68
8.6.2.1	Initial UE Message.....	68
8.6.2.2	DOWNLINK NAS TRANSPORT	70
8.6.2.3	UPLINK NAS TRANSPORT	71
8.6.2.4	NAS NON DELIVERY INDICATION	72
8.6.2.4a	NAS DELIVERY INDICATION	72
8.6.2.5	Reroute NAS Request	72
8.6.3	Unsuccessful Operation	73
8.6.4	Abnormal Conditions.....	73
8.7	Management procedures.....	73
8.7.1	Reset	73
8.7.1.1	General	73
8.7.1.2	Successful Operation.....	73
8.7.1.2.1	Reset Procedure Initiated from the MME.....	73
8.7.1.2.2	Reset Procedure Initiated from the E-UTRAN	74
8.7.1.3	Abnormal Conditions	75
8.7.1.3.1	Abnormal Condition at the EPC	75
8.7.1.3.2	Abnormal Condition at the E-UTRAN	75
8.7.1.3.3	Crossing of Reset Messages	75
8.7.2	Error Indication.....	76
8.7.2.1	General	76
8.7.2.2	Successful Operation.....	76
8.7.2.3	Abnormal Conditions	76
8.7.3	S1 Setup	76
8.7.3.1	General	76
8.7.3.2	Successful Operation.....	77
8.7.3.3	Unsuccessful Operation	77
8.7.3.4	Abnormal Conditions	78
8.7.4	eNB Configuration Update	78
8.7.4.1	General	78
8.7.4.2	Successful Operation.....	78
8.7.4.3	Unsuccessful Operation	79
8.7.4.4	Abnormal Conditions	79

8.7.5	MME Configuration Update	79
8.7.5.1	General	79
8.7.5.2	Successful Operation.....	79
8.7.5.3	Unsuccessful Operation	80
8.7.5.4	Abnormal Conditions	80
8.7.6	Overload Start	80
8.7.6.1	General	80
8.7.6.2	Successful Operation.....	81
8.7.6.3	Unsuccessful Operation	82
8.7.7	Overload Stop	82
8.7.7.1	General	82
8.7.7.2	Successful Operation.....	82
8.7.7.3	Unsuccessful Operation	82
8.8	S1 CDMA2000 Tunnelling Procedures.....	82
8.8.1	General.....	82
8.8.2	Successful Operations.....	83
8.8.2.1	Downlink S1 CDMA2000 Tunnelling	83
8.8.2.2	Uplink S1 CDMA2000 Tunnelling	83
8.8.3	Unsuccessful Operation	84
8.8.4	Abnormal Conditions.....	84
8.9	UE Capability Info Indication	84
8.9.1	General.....	84
8.9.2	Successful Operation	84
8.10	Trace Procedures	85
8.10.1	Trace Start.....	85
8.10.1.1	General	85
8.10.1.2	Successful Operation.....	85
8.10.2	Trace Failure Indication.....	86
8.10.2.1	General	86
8.10.2.2	Successful Operation.....	86
8.10.3	Deactivate Trace	86
8.10.3.1	General	86
8.10.3.2	Successful Operation.....	86
8.10.4	Cell Traffic Trace.....	87
8.10.4.1	General	87
8.10.4.2	Successful Operation.....	87
8.11	Location Reporting Procedures	87
8.11.1	Location Reporting Control	87
8.11.1.1	General	87
8.11.1.2	Successful Operation.....	87
8.11.1.3	Abnormal Conditions	88
8.11.2	Location Report Failure Indication	88
8.11.2.1	General	88
8.11.2.2	Successful Operation.....	88
8.11.3	Location Report	88
8.11.3.1	General	88
8.11.3.2	Successful Operation.....	88
8.11.3.3	Abnormal Conditions	89
8.12	Warning Message Transmission Procedures	89
8.12.1	Write-Replace Warning	89
8.12.1.1	General	89
8.12.1.2	Successful Operation.....	89
8.12.1.3	Abnormal Conditions	90
8.12.2	Kill.....	90
8.12.2.1	General	90
8.12.2.2	Successful Operation.....	90
8.12.3	PWS Restart Indication.....	91
8.12.3.1	General	91
8.12.3.2	Successful Operation.....	91
8.12.4	PWS Failure Indication.....	92
8.12.4.1	General	92
8.12.4.2	Successful Operation.....	92

8.13	eNB Direct Information Transfer	92
8.13.1	General.....	92
8.13.2	Successful Operation	92
8.13.2.1	eNB Direct Information Transfer	92
8.13.3	Abnormal Conditions.....	93
8.14	MME Direct Information Transfer	93
8.14.1	General.....	93
8.14.2	Successful Operation	93
8.14.2.1	MME Direct Information Transfer.....	93
8.14.3	Abnormal Conditions.....	93
8.15	eNB Configuration Transfer.....	93
8.15.1	General.....	93
8.15.2	Successful Operation	94
8.15.2.1	eNB Configuration Transfer.....	94
8.15.3	Abnormal Conditions.....	94
8.16	MME Configuration Transfer.....	94
8.16.1	General.....	94
8.16.2	Successful Operation	95
8.16.2.1	MME Configuration Transfer	95
8.16.3	Abnormal Conditions.....	96
8.17	LPPa transport	96
8.17.1	General.....	96
8.17.2	Successful Operations.....	96
8.17.2.1	DOWNLINK UE ASSOCIATED LPPA TRANSPORT	96
8.17.2.2	UPLINK UE ASSOCIATED LPPA TRANSPORT	96
8.17.2.3	DOWNLINK NON UE ASSOCIATED LPPA TRANSPORT	97
8.17.2.4	UPLINK NON UE ASSOCIATED LPPA TRANSPORT	97
8.17.3	Unsuccessful Operation	97
8.17.4	Abnormal Conditions.....	97
8.18	Secondary RAT Data Usage Report	97
8.18.1	General.....	97
8.18.2	Successful Operations.....	98
8.18.2.1	SECONDARY RAT DATA USAGE REPORT	98
8.18.3	Unsuccessful Operation	98
8.18.4	Abnormal Conditions.....	98
9	Elements for S1AP Communication	99
9.1	Message Functional Definition and Content	99
9.1.1	General.....	99
9.1.2	Message Contents	99
9.1.2.1	Presence	99
9.1.2.2	Criticality	99
9.1.2.3	Range	99
9.1.2.4	Assigned Criticality.....	99
9.1.3	E-RAB Management Messages	100
9.1.3.1	E-RAB SETUP REQUEST.....	100
9.1.3.2	E-RAB SETUP RESPONSE.....	101
9.1.3.3	E-RAB MODIFY REQUEST	102
9.1.3.4	E-RAB MODIFY RESPONSE	103
9.1.3.5	E-RAB RELEASE COMMAND.....	103
9.1.3.6	E-RAB RELEASE RESPONSE	104
9.1.3.7	E-RAB RELEASE INDICATION.....	104
9.1.3.8	E-RAB MODIFICATION INDICATION	105
9.1.3.9	E-RAB MODIFICATION CONFIRM	106
9.1.4	Context Management Messages	106
9.1.4.1	INITIAL CONTEXT SETUP REQUEST	106
9.1.4.2	Void.....	108
9.1.4.3	INITIAL CONTEXT SETUP RESPONSE	108
9.1.4.4	INITIAL CONTEXT SETUP FAILURE.....	108
9.1.4.5	UE CONTEXT RELEASE REQUEST	109
9.1.4.6	UE CONTEXT RELEASE COMMAND	109
9.1.4.7	UE CONTEXT RELEASE COMPLETE	109

9.1.4.8	UE CONTEXT MODIFICATION REQUEST	109
9.1.4.9	UE CONTEXT MODIFICATION RESPONSE	110
9.1.4.10	UE CONTEXT MODIFICATION FAILURE	110
9.1.4.11	UE RADIO CAPABILITY MATCH REQUEST	111
9.1.4.12	UE RADIO CAPABILITY MATCH RESPONSE	111
9.1.4.13	UE CONTEXT MODIFICATION INDICATION	111
9.1.4.14	UE CONTEXT MODIFICATION CONFIRM	111
9.1.4.15	UE CONTEXT SUSPEND REQUEST	112
9.1.4.16	UE CONTEXT SUSPEND RESPONSE	112
9.1.4.17	UE CONTEXT RESUME REQUEST	112
9.1.4.18	UE CONTEXT RESUME RESPONSE	113
9.1.4.19	UE CONTEXT RESUME FAILURE	113
9.1.4.20	CONNECTION ESTABLISHMENT INDICATION	114
9.1.4.21	RETRIEVE UE INFORMATION	114
9.1.4.22	UE INFORMATION TRANSFER	114
9.1.4.23	eNB CP RELOCATION INDICATION	115
9.1.4.24	MME CP RELOCATION INDICATION	115
9.1.5	Handover Signalling Messages	116
9.1.5.1	HANDOVER REQUIRED	116
9.1.5.2	HANDOVER COMMAND	117
9.1.5.3	HANDOVER PREPARATION FAILURE	118
9.1.5.4	HANDOVER REQUEST	119
9.1.5.5	HANDOVER REQUEST ACKNOWLEDGE	121
9.1.5.6	HANDOVER FAILURE	122
9.1.5.7	HANDOVER NOTIFY	122
9.1.5.8	PATH SWITCH REQUEST	123
9.1.5.9	PATH SWITCH REQUEST ACKNOWLEDGE	124
9.1.5.10	PATH SWITCH REQUEST FAILURE	125
9.1.5.11	HANDOVER CANCEL	125
9.1.5.12	HANDOVER CANCEL ACKNOWLEDGE	125
9.1.5.13	eNB STATUS TRANSFER	125
9.1.5.14	MME STATUS TRANSFER	125
9.1.6	PAGING	126
9.1.7	NAS Transport Messages	127
9.1.7.1	INITIAL UE MESSAGE	127
9.1.7.2	DOWNLINK NAS TRANSPORT	129
9.1.7.3	UPLINK NAS TRANSPORT	129
9.1.7.4	NAS NON DELIVERY INDICATION	130
9.1.7.4a	NAS DELIVERY INDICATION	130
9.1.7.5	REROUTE NAS REQUEST	131
9.1.8	Management messages	131
9.1.8.1	RESET	131
9.1.8.2	RESET ACKNOWLEDGE	131
9.1.8.3	ERROR INDICATION	132
9.1.8.4	S1 SETUP REQUEST	132
9.1.8.5	S1 SETUP RESPONSE	133
9.1.8.6	S1 SETUP FAILURE	134
9.1.8.7	ENB CONFIGURATION UPDATE	134
9.1.8.8	ENB CONFIGURATION UPDATE ACKNOWLEDGE	135
9.1.8.9	ENB CONFIGURATION UPDATE FAILURE	136
9.1.8.10	MME CONFIGURATION UPDATE	136
9.1.8.11	MME CONFIGURATION UPDATE ACKNOWLEDGE	136
9.1.8.12	MME CONFIGURATION UPDATE FAILURE	137
9.1.8.13	OVERLOAD START	137
9.1.8.14	OVERLOAD STOP	137
9.1.9	S1 CDMA2000 Tunnelling Messages	138
9.1.9.1	DOWNLINK S1 CDMA2000 TUNNELLING	138
9.1.9.2	UPLINK S1 CDMA2000 TUNNELLING	138
9.1.10	UE CAPABILITY INFO INDICATION	138
9.1.11	Trace Messages	139
9.1.11.1	TRACE START	139
9.1.11.2	TRACE FAILURE INDICATION	139

9.1.11.3	DEACTIVATE TRACE	140
9.1.12	Location Reporting Messages.....	140
9.1.12.1	LOCATION REPORTING CONTROL	140
9.1.12.2	LOCATION REPORT FAILURE INDICATION	140
9.1.12.3	LOCATION REPORT	140
9.1.13	Warning Message Transmission Messages.....	141
9.1.13.1	WRITE-REPLACE WARNING REQUEST	141
9.1.13.2	WRITE-REPLACE WARNING RESPONSE	141
9.1.13.3	KILL REQUEST.....	141
9.1.13.4	KILL RESPONSE.....	142
9.1.13.5	PWS RESTART INDICATION	142
9.1.13.6	PWS FAILURE INDICATION	143
9.1.14	eNB DIRECT INFORMATION TRANSFER	143
9.1.15	MME DIRECT INFORMATION TRANSFER	143
9.1.16	eNB CONFIGURATION TRANSFER.....	143
9.1.17	MME CONFIGURATION TRANSFER.....	143
9.1.18	CELL TRAFFIC TRACE.....	144
9.1.19	LPPa Transport Messages.....	144
9.1.19.1	DOWNLINK UE ASSOCIATED LPPA TRANSPORT.....	144
9.1.19.2	UPLINK UE ASSOCIATED LPPA TRANSPORT	144
9.1.19.3	DOWNLINK NON UE ASSOCIATED LPPA TRANSPORT	145
9.1.19.4	UPLINK NON UE ASSOCIATED LPPA TRANSPORT.....	145
9.1.20	Secondary RAT Report Data Usage Messages.....	145
9.1.20.1	SECONDARY RAT DATA USAGE REPORT.....	145
9.2	Information Element Definitions.....	145
9.2.0	General.....	145
9.2.1	Radio Network Layer Related IEs	146
9.2.1.1	Message Type	146
9.2.1.2	E-RAB ID	146
9.2.1.3	Cause.....	146
9.2.1.3a	RRC Establishment Cause	150
9.2.1.4	Trace Activation.....	150
9.2.1.5	Source ID	151
9.2.1.6	Target ID.....	151
9.2.1.7	Source eNB to Target eNB Transparent Container	152
9.2.1.8	Target eNB to Source eNB Transparent Container	153
9.2.1.9	Source RNC to Target RNC Transparent Container	153
9.2.1.10	Target RNC to Source RNC Transparent Container	154
9.2.1.11	Source BSS to Target BSS Transparent Container	154
9.2.1.12	Target BSS to Source BSS Transparent Container	154
9.2.1.13	Handover Type.....	154
9.2.1.14	Extended RNC-ID.....	154
9.2.1.15	E-RAB Level QoS Parameters.....	154
9.2.1.16	Paging DRX	155
9.2.1.17	Paging Cause.....	155
9.2.1.18	GBR QoS Information	155
9.2.1.19	Bit Rate	156
9.2.1.20	UE Aggregate Maximum Bit Rate	157
9.2.1.21	Criticality Diagnostics.....	157
9.2.1.22	Handover Restriction List	158
9.2.1.23	CDMA2000-PDU	160
9.2.1.24	CDMA2000 RAT Type.....	160
9.2.1.25	CDMA2000 Sector ID	161
9.2.1.26	Security Context.....	161
9.2.1.27	UE Radio Capability	161
9.2.1.28	CDMA2000 HO Status	161
9.2.1.29	CDMA2000 HO Required Indication	162
9.2.1.30	1xRTT MEID.....	162
9.2.1.31	eNB Status Transfer Transparent Container.....	162
9.2.1.32	COUNT Value	164
9.2.1.33	CDMA2000 1xRTT RAND	164
9.2.1.34	Request Type.....	164

9.2.1.35	CDMA2000 1xRTT SRVCC Info.....	165
9.2.1.36	E-RAB List	165
9.2.1.37	Global eNB ID	166
9.2.1.37a	Global en-gNB ID.....	166
9.2.1.38	E-UTRAN CGI	166
9.2.1.39	Subscriber Profile ID for RAT/Frequency priority	166
9.2.1.40	UE Security Capabilities	167
9.2.1.41	Security Key.....	167
9.2.1.42	UE History Information	167
9.2.1.43	Last Visited Cell Information.....	168
9.2.1.43a	Last Visited E-UTRAN Cell Information	168
9.2.1.43b	Last Visited GERAN Cell Information	168
9.2.1.44	Message Identifier.....	169
9.2.1.45	Serial Number	169
9.2.1.46	Warning Area List.....	169
9.2.1.47	Emergency Area ID.....	169
9.2.1.48	Repetition Period.....	170
9.2.1.49	Number of Broadcasts Requested	170
9.2.1.50	Warning Type	170
9.2.1.51	Warning Security Information	170
9.2.1.52	Data Coding Scheme	170
9.2.1.53	Warning Message Contents.....	171
9.2.1.54	Broadcast Completed Area List	171
9.2.1.55	Inter-system Information Transfer Type	171
9.2.1.56	Source To Target Transparent Container	172
9.2.1.57	Target To Source Transparent Container	172
9.2.1.58	SRVCC Operation Possible	173
9.2.1.59	SRVCC HO Indication.....	173
9.2.1.60	Allocation and Retention Priority	173
9.2.1.61	Time to wait	174
9.2.1.62	CSG Id	174
9.2.1.63	CSG Id List	174
9.2.1.64	MS Classmark 2	175
9.2.1.65	MS Classmark 3	175
9.2.1.66	Cell Type.....	175
9.2.1.67	Old BSS to New BSS Information	175
9.2.1.68	Layer 3 Information	175
9.2.1.69	E-UTRAN Round Trip Delay Estimation Info	175
9.2.1.70	Broadcast Cancelled Area List.....	175
9.2.1.71	Number of Broadcasts.....	176
9.2.1.72	Concurrent Warning Message Indicator.....	176
9.2.1.73	CSG Membership Status	177
9.2.1.74	Cell Access Mode	177
9.2.1.75	Extended Repetition Period.....	177
9.2.1.76	Data Forwarding Not Possible	177
9.2.1.77	PS Service Not Available.....	177
9.2.1.78	Paging Priority	177
9.2.1.79	Relay Node Indicator	178
9.2.1.80	Correlation ID	178
9.2.1.81	MDT Configuration	178
9.2.1.82	MME Relay Support Indicator.....	181
9.2.1.83	Management Based MDT Allowed.....	181
9.2.1.84	GW Context Release Indication.....	182
9.2.1.85	Voice Support Match Indicator	182
9.2.1.86	M3 Configuration.....	182
9.2.1.87	M4 Configuration.....	182
9.2.1.88	M5 Configuration.....	182
9.2.1.89	MDT PLMN List	183
9.2.1.90	COUNT Value Extended	183
9.2.1.91	Kill-all Warning Messages Indicator	183
9.2.1.92	LHN ID	183
9.2.1.93	User Location Information	183

9.2.1.94	MBSFN-ResultToLog.....	184
9.2.1.95	EARFCN.....	184
9.2.1.96	Expected UE Behaviour.....	184
9.2.1.97	Expected UE Activity Behaviour.....	185
9.2.1.98	UE Radio Capability for Paging.....	185
9.2.1.99	ProSe Authorized.....	185
9.2.1.100	COUNT Value for PDCP SN Length 18.....	186
9.2.1.101	M6 Configuration.....	186
9.2.1.102	M7 Configuration.....	186
9.2.1.103	Assistance Data for Paging.....	187
9.2.1.104	Assistance Data for Recommended Cells.....	187
9.2.1.105	Information on Recommended Cells and eNBs for Paging.....	187
9.2.1.106	Recommended Cells for Paging.....	187
9.2.1.107	Recommended eNBs for Paging.....	188
9.2.1.108	Assistance Data for CE capable UEs.....	188
9.2.1.109	Cell Identifier and Coverage Enhancement Level.....	189
9.2.1.110	Paging Attempt Information.....	189
9.2.1.111	Paging eDRX Information.....	189
9.2.1.112	UE Retention Information.....	189
9.2.1.113	UE User Plane CIoT Support Indicator.....	189
9.2.1.114	NB-IoT Default Paging DRX.....	190
9.2.1.115	NB-IoT Paging eDRX Information.....	190
9.2.1.116	Bearer Type.....	190
9.2.1.117	RAT Type.....	190
9.2.1.118	CE-mode-B Support Indicator.....	190
9.2.1.119	SRVCC Operation Not Possible.....	190
9.2.1.120	V2X Services Authorized.....	191
9.2.1.121	Served DCNs Items.....	191
9.2.1.122	UE Sidelink Aggregate Maximum Bit Rate.....	191
9.2.1.123	Enhanced Coverage Restricted.....	191
9.2.1.124	Secondary RAT Usage Report List.....	192
9.2.1.125	Handover Flag.....	193
9.2.1.126	Extended Bit Rate.....	193
9.2.1.127	NR UE Security Capabilities.....	193
9.2.1.128	UE Application layer measurement configuration.....	193
9.2.1.129	CE-mode-B Restricted.....	194
9.2.1.130	Packet Loss Rate.....	195
9.2.1.131	Global RAN Node ID.....	195
9.2.1.132	Global gNB ID.....	195
9.2.1.133	Source NG-RAN Node To Target NG-RAN Node Transparent Container.....	195
9.2.1.134	Target NG-RAN Node To Source NG-RAN Node Transparent Container.....	196
9.2.1.135	LTE-M Indication.....	196
9.2.1.136	Aerial UE subscription information.....	196
9.2.1.137	Bluetooth Measurement Configuration.....	196
9.2.1.138	WLAN Measurement Configuration.....	196
9.2.1.139	Warning Area Coordinates.....	197
9.2.1.140	Subscription Based UE Differentiation Information.....	197
9.2.1.141	PSCell Information.....	198
9.2.1.142	NR CGI.....	199
9.2.2	Transport Network Layer Related IEs.....	200
9.2.2.1	Transport Layer Address.....	200
9.2.2.2	GTP-TEID.....	200
9.2.2.3	Tunnel Information.....	200
9.2.3	NAS Related IEs.....	200
9.2.3.1	LAI.....	200
9.2.3.2	RAC.....	200
9.2.3.3	MME UE S1AP ID.....	201
9.2.3.4	eNB UE S1AP ID.....	201
9.2.3.5	NAS-PDU.....	201
9.2.3.6	S-TMSI.....	201
9.2.3.7	TAC.....	201
9.2.3.8	PLMN Identity.....	201

9.2.3.9	GUMMEI	202
9.2.3.10	UE Identity Index value	202
9.2.3.11	IMSI	202
9.2.3.12	MMEC	202
9.2.3.13	UE Paging Identity	203
9.2.3.14	DL Forwarding	203
9.2.3.15	Direct Forwarding Path Availability	203
9.2.3.16	TAI	203
9.2.3.17	Relative MME Capacity	204
9.2.3.18	UE S1AP ID pair	204
9.2.3.19	Overload Response	204
9.2.3.20	Overload Action	204
9.2.3.21	CS Fallback Indicator	204
9.2.3.22	CN Domain	205
9.2.3.23	RIM Transfer	205
9.2.3.24	RIM Information	205
9.2.3.25	RIM Routing Address	205
9.2.3.26	SON Configuration Transfer	206
9.2.3.26a	EN-DC SON Configuration Transfer	207
9.2.3.27	SON Information	207
9.2.3.28	SON Information Reply	208
9.2.3.29	X2 TNL Configuration Info	208
9.2.3.30	NAS Security Parameters from E-UTRAN	209
9.2.3.31	NAS Security Parameters to E-UTRAN	209
9.2.3.32	LPPa-PDU	210
9.2.3.33	Routing ID	210
9.2.3.34	Time Synchronisation Info	210
9.2.3.35	Void	210
9.2.3.36	Traffic Load Reduction Indication	210
9.2.3.37	Additional CS Fallback Indicator	211
9.2.3.38	Masked IMEISV	211
9.2.3.39	SON Information Report	211
9.2.3.40	RLF Report Information	211
9.2.3.41	Muting Pattern Information	211
9.2.3.42	Synchronisation Information	212
9.2.3.43	Listening Subframe Pattern	212
9.2.3.44	MME Group ID	212
9.2.3.45	Additional GUTI	213
9.2.3.46	Extended UE Identity Index Value	213
9.2.3.47	NB-IoT UE Identity Index Value	213
9.2.3.48	DL NAS PDU Delivery Request	213
9.2.3.49	DL CP Security Information	213
9.2.3.50	UL CP Security Information	213
9.2.3.51	UE Capability Info Request	214
9.2.3.52	5GS TAI	214
9.2.3.53	5GS TAC	214
9.2.3.54	End Indication	214
9.2.3.55	Pending Data Indication	214
9.3	Message and Information Element Abstract Syntax (with ASN.1)	215
9.3.0	General	215
9.3.1	Usage of private message mechanism for non-standard use	215
9.3.2	Elementary Procedure Definitions	216
9.3.3	PDU Definitions	230
9.3.4	Information Element Definitions	289
9.3.5	Common Definitions	342
9.3.6	Constant Definitions	342
9.3.7	Container Definitions	350
9.4	Message Transfer Syntax	355
9.5	Timers	355
10	Handling of Unknown, Unforeseen and Erroneous Protocol Data	356
10.1	General	356