ETSI TS 101 376-4-13 V3.5.1 (2017-03)

iTeh STANDARD PREVIEW
(standards.iteh.ai)
https://standards.iteh.ai/catalog/standards/sist/14428f70-03de-40cc-9714-df9203e3c/etsi-ts-101-376-4-13-v3.5.1-2017-03

GEO-Mobile Radio Interface Specifications (Release 3);
Third Generation Satellite Packet Radio Service;
Part 4: Radio interface protocol specifications;
Sub-part 13: Radio Resource Control (RRC) protocol; Iu Mode;
GMR-1 3G 44.118

Reference
RTS/SES-00425

Keywords
3G, GMPRS, GMR, GPRS, GSM, GSO, MES,
mobile, MSS, radio, satellite, S-PCN

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/1a328f70-4de4-4e2c-9784-e29793384e3c/etsi-ts-101-376-4-13-v3.5.1-2017-03

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 only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

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.

© European Telecommunications Standards Institute 2017.
All rights reserved.

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

Contents

Intellectual Property Rights 15
Foreword 15
Modal verbs terminology 16
Introduction 16
1 Scope 18
1.1 General 18
1.2 Scope of the present document 18
1.3 Application to the interface structures 18
1.4 Structure of layer 3 procedures 18
2 References 18
2.1 Normative references 18
2.2 Informative references 21
3 Definitions, abbreviations, random value and specification notations 22
3.1 Definitions 22
3.2 Abbreviations 23
3.3 Void 23
3.4 Specification Notations 23
4 RRC Functions and Services provided to upper layers 23
4.1 RRC Functions 23
4.2 RRC Services provided to upper layers 24
5 Services expected from lower layers 24
5.1 Services required from layer 2 and physical layers 24
5.2 Signalling Radio Bearers 25
6 RRC Protocol modes and states 25
6.1 General 25
6.2 Relation between Iu mode and A/Gb mode 26
6.2.1 Handover between Iu and A/Gb modes 26
6.2.2 Cell reselection between Iu and A/Gb mode 26
6.2a Relation between GERAN Iu mode RRC and UTRA RRC 26
6.2a.1 Handover between GERAN Iu mode and UTRAN 26
6.2a.2 Cell reselection between GERAN Iu mode and UTRAN 26
6.3 RR modes of operation 26
6.4 RRC modes and states 27
6.4.1 RRC-Idle Mode 27
6.4.1.1 General 27
6.4.1.2 Transition from RRC-Idle Mode to RRC-Connected mode 27
6.4.2 RRC-Connected mode: RRC-Cell_Shared state 27
6.4.2.1 General 27
6.4.2.2 Transition from RRC-Cell_Shared state to RRC-Idle Mode 27
6.4.2.3 Transition from RRC-Cell_Shared state to RRC-Cell_Dedicated state 28
6.4.2.4 Transition from RRC-Cell_Shared state to RRC-GRA_PCH state 28
6.4.2.5 Radio resource allocation tasks 28
6.4.2.6 RRC connection mobility tasks 28
6.4.2.7 MES measurements 28
6.4.3 RRC-Connected mode: RRC-Cell_Dedicated state 28
6.4.3.1 General 28
6.4.3.2 Transition from RRC-Cell_Dedicated state to RRC-Cell_Shared state 29
6.4.3.3 Transition from RRC-Cell_Dedicated state to RRC-Idle Mode 29
6.4.3.4 Transition from RRC-Cell_Dedicated state to RRC-GRA_PCH state 29
6.4.3.5 Radio resource allocation tasks 29
6.4.3.6 RRC connection mobility tasks 29
6.4.3.7 MES measurements 29

iTeh STANDARD PREVIEW
(standards.iteh.ai)
https://standards.iteh.ai/catalog/standards/sist/14428f70-0516-4006-9784-df2979384e3c/etsi-ts-101-376-4-13-v3.5.1-2017-03

6.4.4 RRC-Connected mode: RRC-GRA_PCH state 29
6.4.4.1 General 29
6.4.4.2 Transition from RRC-GRA_PCH state to RRC-Cell_Shared state 30
6.4.4.3 Transition from RRC-GRA_PCH state to RRC-Cell_Dedicated state 30
6.4.4.4 Radio resource allocation tasks 30
6.4.4.5 RRC connection mobility tasks 30
6.4.4.6 MES measurements 30
6.4.4.7 Transfer and update of system information 30

7 Radio Resource Control procedures 31
7.1 General 31
7.2 Change of channels in case of handover 31
7.2.1 Change of channel serving SRB1 31
7.2.2 Change of channel serving SRB2 31
7.2.3 Change of channel serving SRB3 31
7.2.4 Change of channel serving SRB4 31
7.3 System information broadcasting 31
7.3.1 General 31
7.3.2 Broadcast of Iu mode specific System Information 32
7.4 Paging procedure 32
7.4.1 General 32
7.4.2 Paging initiation in RRC-Idle mode, or RRC-GRA_PCH state 32
7.4.2.1 General 32
7.4.2.2 Initiation 32
7.4.2.3 Reception of a PAGING INDICATION service primitive 33
7.4.3 Paging initiation in RRC-Cell_Dedicated state 34
7.4.4 Abnormal cases 34
7.5 RRC Connection management procedures 35
7.5.1 RRC connection establishment 35
7.5.1.0 Signalling flow 35
7.5.1.1 General 35
7.5.1.2 Initiation 35
7.5.1.3 RRC CONNECTION REQUEST message contents to set 36
7.5.1.4 Reception of an RRC CONNECTION REQUEST message by the GERAN 36
7.5.1.5 T300 timeout 36
7.5.1.6 Abortion of RRC connection establishment 37
7.5.1.7 Reception of an RRC CONNECTION SETUP message by the MES 37
7.5.1.8 Cell re-selection 38
7.5.1.9 Invalid RRC CONNECTION SETUP message 39
7.5.1.10 Reception of an RRC CONNECTION REJECT message by the MES 39
7.5.1.11 Invalid RRC CONNECTION REJECT message 39
7.5.2 RRC connection release 40
7.5.2.0 Signalling flow 40
7.5.2.1 General 41
7.5.2.2 Initiation 41
7.5.2.3 Reception of an RRC CONNECTION RELEASE message by the MES 41
7.5.2.4 Invalid RRC CONNECTION RELEASE message 42
7.5.2.5 Cell re-selection or radio link failure 42
7.5.2.6 Reception of an RRC CONNECTION RELEASE COMPLETE message by GERAN 42
7.5.2.7 Unsuccessful transmission of the RRC CONNECTION RELEASE COMPLETE message, acknowledged mode transmission 43
7.5.2.8 Detection of loss of dedicated physical channel by GERAN in RRC-Cell_Dedicated state 43
7.5.2.9 Failure to receive RRC CONNECTION RELEASE COMPLETE message by GERAN 43
7.6 Transmission of MES capability information 43
7.6.1 General 43
7.6.2 Initiation 44
7.6.3 Reception of an MES CAPABILITY INFORMATION message by the GERAN 45
7.6.4 Reception of the MES CAPABILITY INFORMATION CONFIRM message by the MES 45
7.6.5 Invalid MES CAPABILITY INFORMATION CONFIRM message 45
7.6.6 T304 timeout 46
7.7 MES capability enquiry 46
7.7.1 General 46

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/14428f70-0e1e-4f7e-8384-e3c4fa1ffe5-101-376-4-13-v3.5.1-2017-03

7.7.2 Initiation....46
7.7.3 Reception of an MES CAPABILITY ENQUIRY message by the MES....47
7.7.4 Invalid MES CAPABILITY ENQUIRY message....47
7.8 RRC Connection mobility procedures....47
7.8.1 Cell Update procedures....47
7.8.1.0 Signalling flows....47
7.8.1.1 General....48
7.8.1.2 Initiation....49
7.8.1.3 CELL UPDATE message contents to set....51
7.8.1.4 Reception of an CELL UPDATE message by the GERAN....52
7.8.1.5 Reception of the CELL UPDATE CONFIRM message by the MES....53
7.8.1.6 Transmission of a response message to GERAN....55
7.8.1.7 Physical channel failure....58
7.8.1.8 Unsupported configuration by the MES....59
7.8.1.9 Invalid configuration....60
7.8.1.10 Incompatible simultaneous reconfiguration....62
7.8.1.10a Security reconfiguration during Cell update procedure....63
7.8.1.11 Void....63
7.8.1.12 Invalid CELL UPDATE CONFIRM message....63
7.8.1.13 T302 expiry or cell reselection....64
7.8.1.14 T314 expiry....67
7.8.1.15 T315 expiry....67
7.8.1.16 Reception of the GERAN MOBILITY INFORMATION CONFIRM message by the GERAN....68
7.8.1.17 Inter-RAT cell reselection to GERAN *Iu mode*....68
7.8.1.17.1 General....68
7.8.1.17.2 Initiation....68
7.8.1.17.3 MES fails to complete an inter-RAT cell reselection....68
7.8.1.18 Inter-RAT cell reselection from GERAN Iu mode....69
7.8.1.18.1 General....69
7.8.1.18.2 Initiation....69
7.8.1.18.3 Successful cell reselection....69
7.8.1.18.4 MES fails to complete an inter-RAT cell reselection....69
7.8.2 GRA update procedure....70
7.8.2.0 Signalling flow....70
7.8.2.1 General....70
7.8.2.2 Initiation....71
7.8.2.3 GRA UPDATE message contents to set....71
7.8.2.4 Reception of an GRA UPDATE message by the GERAN....72
7.8.2.5 Reception of the GRA UPDATE CONFIRM message by the MES....73
7.8.2.6 Transmission of a response message to GERAN....74
7.8.2.7 Invalid configuration....74
7.8.2.8 Incompatible simultaneous reconfiguration....75
7.8.2.9 Confirmation error of GRA ID list....75
7.8.2.10 Invalid CELL GRA UPDATE CONFIRM message....76
7.8.2.11 T302 expiry or cell reselection....77
7.8.3 GERAN mobility information....79
7.8.3.0 Signalling flow....79
7.8.3.1 General....79
7.8.3.2 Initiation....80
7.8.3.3 Reception of GERAN MOBILITY INFORMATION message by the MES....80
7.8.3.4 Reception of an GERAN MOBILITY INFORMATION CONFIRM message by the GERAN....83
7.8.3.5 Cell re-selection....83
7.8.3.6 Incompatible simultaneous security reconfiguration....83
7.8.3.7 Invalid GERAN MOBILITY INFORMATION message....84
7.8.4 Inter-mode handover from GERAN Iu mode....84
7.9 Procedures for System Information transmission and Measurement reporting in RRC-Cell_Dedicated state....84
7.9.0 Relation to ETSI TS 101 376-4-8....84
7.9.1 General....84
7.9.2 Measurement Report and Enhanced Measurement Report....84
7.9.2.1 Void....84
7.9.2.2 Parameters for Measurements and Reporting....84

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/1442f7b0-9ec-9784-df29-7384de3c/etsi-ts-101-376-4-13-v3.5.1-2017-03

7.9.2.2.1 General 84
7.9.2.2.2 Deriving the 3G Neighbour Cell list from the 3G Neighbour Cell Description 85
7.9.2.2.3 Deriving the GSM Neighbour Cell list from the BSICs and the BCCH Allocation 85
7.9.2.2.4 Deriving the Neighbour Cell list from the GSM Neighbour Cell list and the 3G Neighbour Cell list 85
7.9.2.2.5 Real Time Differences 85
7.9.2.2.6 Report Priority Description 85
7.9.2.2.7 The 3G Cell Reselection list 85
7.9.2.2.8 CCN Support description 85
7.9.3 Extended measurement report 85
7.10 Void 86
7.11 Void 86
7.12 Mapping of user data substreams onto timeslots in a multislot configuration 86
7.13 Application Procedures 86
7.13.1 LCS transfer 86
7.13.1.0 Signalling flow 86
7.13.1.1 General 86
7.13.1.2 Initiation of LCS transfer procedure in the GERAN 86
7.13.1.3 Reception of LCS DOWNLINK INFORMATION message by the MES 87
7.13.1.4 Transmission of a response message by the MES 87
7.13.1.5 Reception of a response message by the GERAN 87
7.13.1.6 Invalid LCS DOWNLINK INFORMATION message 87
7.13.2 Position Reporting 88
7.13.2.0 Signalling flow 88
7.13.2.1 General 88
7.13.2.2 Initiation of position reporting procedure in the GERAN 88
7.13.2.3 Reception of POSITION REPORT REQUEST message by the MES 88
7.13.2.4 Transmission of a response message by the MES 88
7.13.2.5 Reception of a response message by the GERAN 88
7.13.2.6 Invalid POSITION REPORT REQUEST message 88
7.13.2a Autonomous Position Update 89
7.13.2a.0 Signalling flow 89
7.13.2a.1 General 89
7.13.2a.2 Enabling and Disabling of Autonomous Position Update 89
7.13.2a.3 Transmission of POSITION UPDATE INDICATION message by the MES 90
7.13.2a.4 Reception of POSITION UPDATE INDICATION message by the GERAN 90
7.13.3 RAB Upper Layer Reconfiguration 90
7.13.3.0 Signalling flow 90
7.13.3.1 General 90
7.13.3.2 Initiation of RAB Upper Layer Reconfiguration procedure in the GERAN 90
7.13.3.3 Reception of RAB Upper Layer Reconfiguration message by the MES 90
7.13.3.4 Transmission of a response message by the MES 91
7.13.3.5 Reception of a response message by the GERAN 91
7.13.4 RAB Binding 91
7.13.4.0 Signalling flow 91
7.13.4.1 General 91
7.13.4.2 Initiation of RAB Binding procedure in the MES 91
7.13.4.2.0 General 91
7.13.4.2.1 Adding a RAB Binding 91
7.13.4.2.2 Updating a RAB Binding 92
7.13.4.2.3 Removing a RAB Binding 92
7.13.4.3 Reception of RAB Binding Request message by the GERAN 92
7.13.4.4 Transmission of a response message by the GERAN 92
7.13.4.5 Reception of a response message by the MES 92
7.14 Radio Bearer control procedures 92
7.14.1 Reconfiguration procedures 92
7.14.1.0 Signalling flow 92
7.14.1.1 General 94
7.14.1.2 Initiation 95
7.14.1.3 Reception of RADIO BEARER SETUP or RADIO BEARER RECONFIGURATION or RADIO BEARER RELEASE message by the MES 97
7.14.1.4 Transmission of a response message by the MES, normal case 104

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/1442870a-03de-40cd-8a3a-f29793384e35/etsi-ts-101-376-4-13-v3.5.1-2017-03

7.14.1.5 Reception of a response message by the GERAN, normal case 107
7.14.1.6 Unsupported configuration in the MES 108
7.14.1.7 Physical channel failure 108
7.14.1.8 Cell re-selection 109
7.14.1.9 Transmission of a response message by the MES, failure case 109
7.14.1.10 Reception of a response message by the GERAN, failure case 110
7.14.1.11 Invalid configuration 110
7.14.1.12 Incompatible simultaneous reconfiguration 111
7.14.1.12.0 General 111
7.14.1.12.1 Incompatible simultaneous security reconfiguration 111
7.14.1.12.2 Cell Update procedure during security reconfiguration 111
7.14.1.13 Invalid received message 112
7.14.1.14 Abnormal cases 112
7.14.2 MES initiated DTM procedures while in RRC-Cell_Dedicated-MAC-Dedicated state 114
7.14.2.1 General 114
7.14.2.2 Initiation of the DTM Request procedure by the MES 114
7.14.2.3 Reception of a GERAN Iu mode DTM REQUEST message by the GERAN 115
7.14.2.3.1 General 115
7.14.2.3.2 PDCH assignment 115
7.14.2.3.3 DTM Request rejection 115
7.14.2.3.4 Reception of a GERAN Iu mode DTM REJECT message by the MES, normal case 115
7.14.2.3.5 Invalid GERAN Iu mode DTM REJECT message 116
7.14.2.4 Abnormal cases 116
7.14.2.5 T3148 expiry 116
7.15 Signalling flow procedures 117
7.15.1 Signalling connection release procedure 117
7.15.1.1 General 117
7.15.1.2 Initiation of SIGNALLING CONNECTION RELEASE by the GERAN 117
7.15.1.3 Reception of SIGNALLING CONNECTION RELEASE by the MES 117
7.15.1.4 Invalid SIGNALLING CONNECTION RELEASE message 117
7.15.1.5 Invalid configuration 118
7.15.2 Signalling connection release indication procedure 118
7.15.2.1 General 118
7.15.2.2 Initiation 118
7.15.2.2a RLC re-establishment, inter-mode handover or inter-RAT change 119
7.15.2.3 Reception of SIGNALLING CONNECTION RELEASE INDICATION by the GERAN 119
7.16 Security mode control 120
7.16.1 Security mode control 120
7.16.1.0 Signalling flow 120
7.16.1.1 General 120
7.16.1.2 Initiation 120
7.16.1.2.1 Ciphering configuration change 120
7.16.1.2.2 Integrity protection configuration change 122
7.16.1.2.3 Reception of SECURITY MODE COMMAND message by the MES 124
7.16.1.2.4 Incompatible simultaneous security reconfiguration 131
7.16.1.2.5 Cell Update procedure during security reconfiguration 131
7.16.1.2.6 Invalid configuration 132
7.16.1.2.7 Reception of SECURITY MODE COMPLETE message by the GERAN 133
7.16.1.2.8 Invalid SECURITY MODE COMMAND message 134
7.17 Delivery of Non-Access stratum messages 135
7.17.1 Initial Direct transfer 135
7.17.1.0 Signalling flow 135
7.17.1.1 General 135
7.17.1.2 Initiation of Initial direct transfer procedure in the MES 135
7.17.1.3 RLC re-establishment, inter-mode handover or inter-RAT change 137
7.17.1.4 Abortion of signalling connection establishment 137
7.17.1.5 Reception of INITIAL DIRECT TRANSFER message by the GERAN 137
7.17.2 Downlink Direct transfer 137
7.17.2.0 Signalling flow 137
7.17.2.1 General 137
7.17.2.2 Initiation of downlink direct transfer procedure in the GERAN 138
7.17.2.3 Reception of a DOWNLINK DIRECT TRANSFER message by the MES 138

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/1442870a-03de-40cd-9e84-df29773841e3/etsi-ts-101-376-4-13-v3.5.1-2017-03

7.17.2.4 No signalling connection exists....138
7.17.2.5 Invalid DOWNLINK DIRECT TRANSFER message....138
7.17.3 Uplink Direct transfer....139
7.17.3.0 Signalling flow....139
7.17.3.1 General....139
7.17.3.2 Initiation of uplink direct transfer procedure in the MES....139
7.17.3.3 RLC re-establishment, inter-mode handover or inter-RAT change....140
7.17.3.4 Reception of UPLINK DIRECT TRANSFER message by the GERAN....140
7.18 General procedures....140
7.18.1 Selection of initial MES identity....140
7.18.2 Actions when entering RRC-Idle mode from RRC-Connected mode....140
7.18.2a Void....141
7.18.3 Maintenance of Hyper Frame Numbers....142
7.18.4 START value calculation....142
7.18.5 Integrity protection....143
7.18.5.0 General....143
7.18.5.1 Integrity protection in downlink....144
7.18.5.2 Integrity protection in uplink....146
7.18.5.3 Calculation of message authentication code....147
7.18.6 Physical channel establishment....148
7.18.6.0 General....148
7.18.6.1 Finely synchronized cell case....149
7.18.6.2 Non synchronized cell case....149
7.18.6.3 Pseudo-synchronized cell case....150
7.18.6.4 Pre-synchronized cell case....150
7.18.7 Void....151
7.18.8 Link failure and Radio link failure criteria and actions upon link or radio link failure....151
7.18.9 Unsupported configuration....151
7.18.10 Invalid RLC/MAC control message notification....151
7.18.11 Actions related to Radio Bearer mapping....151
7.18.12 Network response times for DCH allocation....152
7.19 Generic actions on receipt and absence of an information element....152
7.19.1 CN information info....152
7.19.2 Signalling connection release indication....153
7.19.2a MES Timers and Constants in Connected Mode....153
7.19.3 GERAN mobility information elements....153
7.19.3.1 GRA identity....153
7.19.3.2 Mapping info....154
7.19.4 MES information elements....154
7.19.4.1 Downlink Activation time....154
7.19.4.2 DRX parameters....155
7.19.4.2.1 Void....155
7.19.4.2.2 GERAN DRX cycle length coefficient....155
7.19.4.2.3 Paging Group....155
7.19.4.3 Generic state transition rules depending on received information elements....155
7.19.4.4 Ciphering mode info....156
7.19.4.5 Integrity protection mode info....159
7.19.4.5.1 General....159
7.19.4.5.2 Initialization of Integrity Protection....160
7.19.4.5.3 Integrity Protection Re-configuration for SBSS Relocation....160
7.19.4.5.4 Integrity Protection modification in case of new keys or initialization of signalling connection....161
7.19.4.6 Integrity check info....162
7.19.4.7 New G-RNTI....162
7.19.4.8 RRC Transaction Identifier....162
7.19.4.9 Capability Update Requirement....166
7.19.4.10 Position Update Timers....166
7.19.4.11 STARTn....166
7.19.4.12 Ciphering Key....167
7.19.5 Radio bearer information elements....167
7.19.5.1 Signalling RB information to setup list....167
7.19.5.2 RAB Information for Setup....167
7.19.5.3 RAB Information to Reconfigure....168

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/1442870a-03de-40ce-9f4d-df29752d4e3c/etsi-ts-101-376-4-13-v3.5.1-2017-03

7.19.5.4 RB information to setup 168
7.19.5.5 RB information to be affected 169
7.19.5.6 RB information to reconfigure 170
7.19.5.7 RB Information to Release 170
7.19.5.8 RB with PDCP Information 171
7.19.5.9 Void 171
7.19.5.9a RB Mapping Info 171
7.19.5.10 RLC Info 171
7.19.5.11 PDCP Info 171
7.19.5.11a PDCP context relocation info 173
7.19.5.12 PDCP SN Info 173
7.19.5.13 NAS Synchronization Indicator 174
7.19.5.14 Physical Channel Configuration 174
7.19.5.15 RLC Sequence Number 174
7.19.6 Physical channel parameters 174
7.19.6.1 DCH Description 174
7.19.6.2 PDCH parameters 175
7.19.7 Transport channel information elements 175
7.20 Key Exchange Procedure 176
7.20.1 General 176

8 Handling of unknown, unforeseen, and erroneous protocol data 176
8.1 General 176
8.2 CSN.1 violation or encoding error 177
8.3 Unknown or unforeseen message type 177
8.4 Unsolicited received message 177
8.5 Unexpected critical message extension 178
8.6 Message with error label: "Content part error" 178
8.7 Unknown or unforeseen information element value, mandatory information element 178
8.8 Unexpected non-critical message extension 179
8.9 Message with error label: "Message escape" 179
8.10 Handling of errors in nested information elements 180
8.11 Void 181

9 Message functional definitions and contents 181
9.1 General 181
9.1.1 Introduction 181
9.1.2 Repetitions of Structure, IE or field 182
9.1.3 Message format and error labels 182
9.1.3.1 General 182
9.1.3.2 Message extension for new protocol version in RRC 183
9.1.3.2.0 General 183
9.1.3.2.1 Non-Critical extension 183
9.1.3.2.2 Critical extension 184
9.1.3.2.3 Extension of IEs 184
9.1.3.2.4 "Message escape" error label 185
9.2 Messages for Radio Resources management 185
9.2.1 General 185
9.2.1.0 Message definitions overview 185
9.2.1.1 References 185
9.2.1.2 Downlink RRC messages 187
9.2.1.3 Uplink RRC messages 188
9.2.1.3.0 General 188
9.2.1.3.1 Message definitions 188
9.2.2 CELL UPDATE 188
9.2.3 CELL UPDATE CONFIRM 188
9.2.4 DEDICATED PAGING REQUEST 191
9.2.5 DOWNLINK DIRECT TRANSFER 191
9.2.6 EXTENDED MEASUREMENT ORDER 192
9.2.7 EXTENDED MEASUREMENT REPORT 192
9.2.7a ENHANCED MEASUREMENT REPORT 192
9.2.8 GERAN MOBILITY INFORMATION 192

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/14428f70-03de-40cc-9784-df2979384e3c/etsi-ts-101-376-4-13-v3.5.1-2017-03

9.2.9 GERAN MOBILITY INFORMATION CONFIRM 193
9.2.10 GERAN MOBILITY INFORMATION FAILURE 194
9.2.11 GRA UPDATE 194
9.2.12 GRA UPDATE CONFIRM 195
9.2.13 Void 196
9.2.14 HANDOVER COMPLETE 196
9.2.15 HANDOVER FAILURE 198
9.2.16 HANDOVER FROM GERAN Iu COMMAND 198
9.2.17 INITIAL DIRECT TRANSFER 198
9.2.18 INTER SYSTEM TO CDMA2000 HANDOVER COMMAND 199
9.2.19 INTER SYSTEM TO UTRAN HANDOVER COMMAND 199
9.2.20 LCS DOWNLINK INFORMATION 199
9.2.20a POSITION REPORT REQUEST 199
9.2.21 LCS UPLINK INFORMATION 200
9.2.21a POSITION REPORT RESPONSE 200
9.2.21b POSITION UPDATE INDICATION 201
9.2.22 MEASUREMENT INFORMATION 201
9.2.22a MEASUREMENT ORDER 201
9.2.23 MEASUREMENT REPORT 202
9.2.24 MES CAPABILITY ENQUIRY 203
9.2.25 MES CAPABILITY INFORMATION 203
9.2.26 MES CAPABILITY INFORMATION CONFIRM 204
9.2.26a RAB BINDING REQUEST 205
9.2.26b RAB BINDING RESPONSE 206
9.2.27a RAB UPPER LAYER RECONFIGURATION 207
9.2.27b RAB UPPER LAYER RECONFIGURATION COMPLETE 208
9.2.28 RADIO BEARER RECONFIGURATION 208
9.2.29 RADIO BEARER RECONFIGURATION COMPLETE 212
9.2.30 RADIO BEARER RECONFIGURATION FAILURE 213
9.2.31 RADIO BEARER RELEASE 213
9.2.32 RADIO BEARER RELEASE COMPLETE 215
9.2.33 RADIO BEARER RELEASE FAILURE 216
9.2.34 RADIO BEARER SETUP 217
9.2.35 RADIO BEARER SETUP COMPLETE 220
9.2.35a CHANNEL CHANGE PREPARATION COMPLETE 221
9.2.36 RADIO BEARER SETUP FAILURE 222
9.2.37 RRC CONNECTION REJECT 223
9.2.38 RRC CONNECTION RELEASE 223
9.2.39 RRC CONNECTION RELEASE COMPLETE 224
9.2.40 RRC CONNECTION REQUEST 225
9.2.41 RRC CONNECTION SETUP 225
9.2.42 RRC CONNECTION SETUP COMPLETE 226
9.2.43 RRC STATUS 228
9.2.44 RRC FAILURE INFO 229
9.2.45 SECURITY MODE COMMAND 229
9.2.46 SECURITY MODE COMPLETE 230
9.2.47 SECURITY MODE FAILURE 231
9.2.48 SIGNALLING CONNECTION RELEASE 231
9.2.49 SIGNALLING CONNECTION RELEASE INDICATION 232
9.2.50 Void 232
9.2.51 Void 232
9.2.52 Void 232
9.2.53 Void 232
9.2.54 Void 232
9.2.55 Void 232
9.2.56 UPLINK DIRECT TRANSFER 232
9.2.57 GERAN Iu mode DTM REQUEST 233
9.2.58 GERAN Iu mode DTM REJECT 233
9.2.59 Downlink Key Exchange 234
9.2.60 Uplink Key Exchange 235
9.3 Information Elements 235
9.3.1 Activation Time 235

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ETSI TS 101 376-4-13 V3.5.1 (2017-03)
https://standards.iteh.ai/catalog/standards/sist/1442870a-59e-40c-9f4-df29793384e3c/etsi-ts-101-376-4-13-v3.5.1-2017-03

9.3.2 BA List Pref 235
9.3.3 BA Range 235
9.3.4 Capability Update Requirement 236
9.3.5 CDMA2000 MES security capability 236
9.3.6 Cell Channel Description 236
9.3.7 Cell Description 236
9.3.7a GMR-1 Spotbeam Description 236
9.3.8 Cell Update Cause 237
9.3.9 Channel Description 237
9.3.10 Channel Description 2 238
9.3.11 Channel Mode 238
9.3.12 Channel Mode 2 238
9.3.13 Ciphering Algorithm 238
9.3.14 Ciphering Mode Info 238
9.3.15 CN Domain Identity 239
9.3.16 Void 239
9.3.17 CN Information Info 239
9.3.18 Void 240
9.3.19 DCH Description 240
9.3.20 Dynamic ARFCN Mapping 240
9.3.21 Establishment Cause 240
9.3.22 Expiration Time Factor 241
9.3.23 Extension 241
9.3.24 Failure Cause 241
9.3.25 Failure Cause and Error Information 241
9.3.26 Frequency Channel Sequence 242
9.3.27 Frequency List 242
9.3.28 Frequency Short List 242
9.3.29 GERAN DRX Cycle Length Coefficient 242
9.3.30 GRA Identity 242
9.3.30a GMR-1 Cell Identity 242
9.3.31 GRA Update Cause 242
9.3.32 G-RNTI 243
9.3.33 GSM MES Security Capability 243
9.3.34 Handover Reference 244
9.3.34a Handover Traffic Carrier Info 244
9.3.35 Initial MES Identity 245
9.3.36 Integrity Check Info 245
9.3.37 Integrity Protection Activation Info 246
9.3.38 Integrity Protection Algorithm 246
9.3.39 Integrity Protection Mode Info 246
9.3.40 Void 247
9.3.41 Intra Domain NAS Node Selector 247
9.3.42 Mobile Allocation 247
9.3.43 Mobile Time Difference 247
9.3.44 MES GERAN A/Gb mode Radio Access Capability 248
9.3.45 MES GERAN Iu mode Radio Access Capability 248
9.3.45a GMPRS Terminal Type Identifier 249
9.3.46 MES GERAN Iu mode RLC Capability 249
9.3.47 MES RF Capability GSM 250
9.3.48 MES Multi-Mode and Multi-RAT Capability 253
9.3.49 MES Measurement Capability 253
9.3.50 MES Positioning Capability 254
9.3.51 MES Timers and Constants in RRC-Connected mode 255
9.3.51a MES Additional Timers and Constants in RRC-Connected mode 256
9.3.52 MultiRate Configuration 256
9.3.53 Multislot Allocation 256
9.3.54 NAS Message 256
9.3.55 NAS Synchronization Info 257
9.3.56 NAS System Information GSM-MAP 257
9.3.57 Paging Cause 257
9.3.58 Paging Record Type Identifier 258

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/1442870a-03de-40cc-9784-df2979384de3c/etsi-ts-101-376-4-13-v3.5.1-2017-03

9.3.59 PDCP Capability 258
9.3.59a Data Compression Parameters 260
9.3.60 PDCP Info 261
9.3.61 PDCP SN Info 265
9.3.62 Physical Channel Configuration 265
9.3.62a Physical Channel Description 265
9.3.63 PLMN Identity 267
9.3.64 Power Command 267
9.3.65 Power Command and Access Type 267
9.3.66 Void 268
9.3.67 Void 268
9.3.68 Void 268
9.3.69 Protocol Error Cause 268
9.3.70 Protocol Error Indicator 268
9.3.71 Protocol Error Information 268
9.3.72 RAB Identity 269
9.3.73 RAB Info 269
9.3.74 RAB Info Post 270
9.3.74a RAB Info to Relocate 270
9.3.75 RAB Information for Setup 271
9.3.75a RAB Information for Handover 272
9.3.76 RAB Information to Reconfigure 272
9.3.77 RB Activation Time Info 273
9.3.78 RB COUNT-C Information 273
9.3.79 RB COUNT-C MSB Information 274
9.3.80 RB Identity 274
9.3.80a RRB Identity 274
9.3.81 RB Information to Be Affected 274
9.3.82 RB Information to Reconfigure 275
9.3.82a PDCP - RB Information to Reconfigure 275
9.3.83 RB Information to Release 276
9.3.84 RB Information to Setup 276
9.3.84a PDCP - RB Information to Setup 276
9.3.84b RB CipheringSynchronization 277
9.3.85 RB Timer Indicator 277
9.3.86 RB with PDCP Information 278
9.3.87 Void 278
9.3.88 Re-Establishment timer 278
9.3.89 Rejection Cause 278
9.3.90 Release Cause 279
9.3.91 RLC Info 279
9.3.92 RLC HFN IE 280
9.3.93 RPLMN Information 280
9.3.94 RRC Cause 280
9.3.95 RRC Packet Downlink Assignment 281
9.3.95a RRC Packet Downlink Assignment 2 281
9.3.96 RRC Packet Uplink Assignment 281
9.3.96a RRC Packet Uplink Assignment 2 281
9.3.97 RRC State Indicator 282
9.3.98 RRC Transaction Identifier 282
9.3.98a Reference 282
9.3.99 PDCH Description 282
9.3.100 Security Capability 283
9.3.101 Signalling RB Information To Setup 283
9.3.102 START 284
9.3.103 Starting Time 284
9.3.104 Synchronization Indication 284
9.3.105 Time Difference 285
9.3.106 Timing Advance 285
9.3.107 Transmission RLC Discard 285
9.3.108 UE UTRAN Radio Access Capability 285
9.3.108a UE UTRAN Predefined Configuration Status Information 286

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/1442870a-03de-40cc-9784-df2979384e3c/etsi-ts-101-376-4-13-v3.5.1-2017-03

9.3.109 UE UTRAN Radio Access Capability Extension 286
9.3.110 UE CDMA2000 Radio Access Capability 286
9.3.110a UE Software Version Indicator 287
9.3.111 UTRAN Freq List 287
9.3.112 Wait Time 287
9.3.113 Iu mode Channel Request Description 288
9.3.114 Wait Indication 288
9.3.115 Void 288
9.3.116 PDCP Context Relocation Info 288
9.3.117 RB mapping info 289
9.3.118 Interleaving 289
9.3.119 Mode 289
9.3.120 Modulation 289
9.3.121 Added or Reconfigured DL TrCH information 289
9.3.122 Added or Reconfigured UL TrCH information 289
9.3.123 Deleted DL TrCH information 289
9.3.124 Deleted UL TrCH information 289
9.3.125 DL TrCH Information Common For All Transport Channels 290
9.3.126 Semi-static Transport Format Information 290
9.3.127 TFCS Explicit Configuration 290
9.3.128 Void 290
9.3.129 TFCS Removal Information 290
9.3.130 Transport Channel Identity 290
9.3.131 TFC 290
9.3.132 Transport Format Combination Set 290
9.3.133 Transport Format Set 290
9.3.134 UL TrCH Information Common For All Transport Channels 290
9.3.135 Upper Layer Bearer Info 290
9.3.136 RLC Sequence Number 291
9.3.137 Carrier Reconfiguration Type 291
9.3a Information element definitions 291
9.4 Multiplicity values and type constraint values 295
9.4a Constant definitions 296

10 Protocol timers, counters, other parameters and default configurations 296
10.1 Timers for MES 296
10.1a Timers on the network side 297
10.2 Counters for MES 297
10.3 MES constants and parameters 298
10.3a Network constants and parameters 298
10.4 MES variables 298
10.4.0 General 298
10.4.1 CELL_UPDATE_STARTED 299
10.4.2 CIPHERING_STATUS 300
10.4.3 ESTABLISHED_SIGNALLING_CONNECTIONS 300
10.4.4 ESTABLISHMENT_CAUSE 301
10.4.5 ESTABLISHED_RABS 301
10.4.6 FAILURE_CAUSE 302
10.4.7 FAILURE_INDICATOR 302
10.4.8 GRA_IDENTITY 303
10.4.9 G_RNTI 303
10.4.10 INITIAL_MES_IDENTITY 303
10.4.11 INCOMPATIBLE_SECURITY_RECONFIGURATION 303
10.4.12 INTEGRITY_PROTECTION_ACTIVATION_INFO 304
10.4.13 INTEGRITY_PROTECTION_INFO 304
10.4.14 INVALID_CONFIGURATION 305
10.4.14a LATEST_CONFIGURED_CN_DOMAIN 305
10.4.15 MES_CAPABILITY_REQUESTED 306
10.4.16 MES_CAPABILITY_TRANSFERRED 306
10.4.17 ORDERED_RECONFIGURATION 307
10.4.18 PDCP_SN_INFO 307
10.4.19 PROTOCOL_ERROR_INDICATOR 307

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/1442f7b-03de-40cc-97f4-df29793384e3c/etsi-ts-101-376-4-13-v3.5.1-2017-03