

ETSI TS 124 379 V13.14.0 (2020-01)



LTE;
Mission Critical Push To Talk (MCPTT) call control;
Protocol specification
(3GPP TS 24.379 version 13.14.0 Release 13)

Full Standard Preview
https://standards.iteh.ai/catalog/standards/sis/805eb9d0-60c4-4aac-bb5e-36921b4e449c/etsi-ts-124-379-v13-14-0-2020-01



ReferenceRTS/TSGC-0124379vde0

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/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.....	21
1 Scope	22
2 References	22
3 Definitions, symbols and abbreviations	25
3.1 Definitions	25
3.2 Abbreviations	26
4 General	27
4.1 MCPTT overview.....	27
4.2 URI and address assignments.....	28
4.3 MCPTT speech.....	28
4.4 Warning Header Field	29
4.4.1 General.....	29
4.4.2 Warning texts.....	29
4.5 MCPTT session identity	32
4.6 MCPTT priority calls and alerts	33
4.6.1 MCPTT emergency group calls.....	33
4.6.2 MCPTT emergency private calls	34
4.6.3 MCPTT emergency alerts.....	35
4.6.4 MCPTT imminent peril group call.....	36
4.7 End-to-end communication security.....	37
4.8 Protection of sensitive application data.....	38
4.9 Pre-established session	41
4.10 MCPTT client ID	42
4.11 Off-network MCPTT.....	42
5 Functional entities	43
5.1 Introduction	43
5.2 MCPTT client.....	43
5.3 MCPTT server.....	44
5.3.1 General.....	44
5.3.2 Functional connectivity models	45
6 Common procedures.....	47
6.1 Introduction	47
6.2 MCPTT client procedures	47
6.2.0 Distinction of requests at the MCPTT client	47
6.2.0.1 SIP MESSAGE request.....	47
6.2.1 SDP offer generation	47
6.2.2 SDP answer generation.....	48
6.2.3 Commencement modes.....	49
6.2.3.1 Automatic commencement mode.....	49
6.2.3.1.1 Automatic commencement mode for private calls	49
6.2.3.1.2 Automatic commencement mode for group calls	49
6.2.3.2 Manual commencement mode	49
6.2.3.2.1 Manual commencement mode for private calls	49
6.2.3.2.2 Manual commencement mode for group calls.....	50
6.2.4 Leaving an MCPTT session initiated by MCPTT client.....	50
6.2.4.1 On-demand session case	50
6.2.4.2 Pre-established session case	51
6.2.5 Releasing an MCPTT session initiated by MCPTT client	51
6.2.5.1 On-demand session case	51

6.2.5.2	Pre-established session case	51
6.2.6	Receiving an MCPTT session release request	52
6.2.7	Receiving a SIP MESSAGE request.....	52
6.2.8	Priority call conditions.....	52
6.2.8.1	MCPTT emergency group call conditions	52
6.2.8.1.1	SIP INVITE request or SIP REFER request for originating MCPTT emergency group calls	52
6.2.8.1.2	Resource-Priority header field for MCPTT emergency group calls	53
6.2.8.1.3	SIP re-INVITE request for cancelling MCPTT in-progress emergency group state	54
6.2.8.1.4	Receiving a SIP 2xx response to a SIP request for a priority call	55
6.2.8.1.5	Receiving a SIP 4xx response, SIP 5xx response or SIP 6xx response to a SIP request for a priority group call	55
6.2.8.1.6	Determining authorisation for initiating or cancelling an MCPTT emergency alert	56
6.2.8.1.7	Determining authorisation for cancelling the in-progress emergency state of an MCPTT group.....	56
6.2.8.1.8	Determining authorisation for originating a priority group call	56
6.2.8.1.9	SIP request for originating MCPTT imminent peril group calls	57
6.2.8.1.10	Determining authorisation for cancelling an imminent peril group call	58
6.2.8.1.11	SIP re-INVITE request for cancelling MCPTT in-progress imminent peril group state	58
6.2.8.1.12	Resource-Priority header field for MCPTT imminent peril group calls	58
6.2.8.1.13	Receiving a SIP INFO request in the dialog of a SIP request for a priority group call	59
6.2.8.1.14	SIP re-INVITE request for cancelling the in-progress emergency group state of a group by a third-party	59
6.2.8.1.15	Retrieving Resource-Priority header field values	60
6.2.8.1.16	Handling receipt of a SIP re-INVITE request for priority group call origination status within a pre-established session.....	61
6.2.8.1.17	Priority group call conditions upon receiving call release.....	61
6.2.8.1.18	Emergency private call conditions upon receiving call release	62
6.2.8.2	Request for an originating broadcast group call.....	62
6.2.8.3	MCPTT emergency private call conditions.....	62
6.2.8.3.1	Authorisations	62
6.2.8.3.1.1	Determining authorisation for initiating an MCPTT emergency private call	62
6.2.8.3.1.2	Determining authorisation for cancelling an MCPTT emergency private call	63
6.2.8.3.1.3	Determining authorisation for initiating or cancelling an MCPTT emergency alert to a MCPTT user	63
6.2.8.3.2	SIP request for originating MCPTT emergency private calls.....	63
6.2.8.3.3	Resource-Priority header field for MCPTT emergency private calls	64
6.2.8.3.4	Receiving a SIP 2xx response to a SIP request for an MCPTT emergency private call.....	64
6.2.8.3.5	Receiving a SIP 4xx response, SIP 5xx response or SIP 6xx response to a SIP request for an MCPTT emergency private call.....	64
6.2.8.3.6	SIP re-INVITE request for cancelling MCPTT emergency private call state.....	65
6.2.8.3.7	Receiving a SIP INFO request in the dialog of a SIP request for a priority private call.....	66
6.2.8.3.8	SIP re-INVITE request for cancelling the MCPTT emergency private call state by a third-party.....	66
6.2.9	Location information	67
6.2.9.1	Location information for location reporting.....	67
6.3	MCPTT server procedures	68
6.3.1	Distinction of requests sent to the MCPTT server	68
6.3.1.1	SIP INVITE request	68
6.3.1.2	SIP REFER request	68
6.3.1.3	SIP MESSAGE request.....	68
6.3.1.4	SIP SUBSCRIBE request.....	69
6.3.2	Participating MCPTT Function.....	69
6.3.2.1	Requests initiated by the served MCPTT user	69
6.3.2.1.1	SDP offer generation	69
6.3.2.1.1.1	On-demand session	69
6.3.2.1.1.2	Pre-established session.....	70
6.3.2.1.2	SDP answer generation.....	70
6.3.2.1.2.1	On-demand session	70
6.3.2.1.2.2	Pre-established session establishment.....	71
6.3.2.1.3	Sending an INVITE request on receipt of an INVITE request	71
6.3.2.1.4	Sending an INVITE request on receipt of a REFER request.....	72
6.3.2.1.5	Response to an INVITE request	72

6.3.2.1.5.1	Provisional responses.....	72
6.3.2.1.5.2	Final response	73
6.3.2.1.6	Sending a SIP BYE request on receipt of a SIP BYE request	73
6.3.2.1.7	Sending a SIP BYE request on receipt of a SIP REFER request.....	74
6.3.2.1.8	Priority call conditions	74
6.3.2.1.8.1 Determining authorisation for originating a priority group call.....	74
6.3.2.1.8.2	Determining authorisation for initiating or cancelling an MCPTT emergency alert.....	75
6.3.2.1.8.3	Validate priority request parameters	76
6.3.2.1.8.4	Retrieving Resource-Priority header field values	76
6.3.2.1.8.5	Generating a SIP re-INVITE request for priority group call origination within a pre-established session	76
6.3.2.1.8.6	Generating a SIP re-INVITE request for emergency private call origination within a pre-established session	77
6.3.2.1.9	Generating a SIP re-INVITE request on receipt of a SIP re-INVITE request	78
6.3.2.1.10	Sending a SIP INVITE request on receipt of SIP 3xx response	78
6.3.2.2	Requests terminated to the served MCPTT user	79
6.3.2.2.1	SDP offer generation	79
6.3.2.2.2	SDP answer generation.....	79
6.3.2.2.2.1	On-demand session	79
6.3.2.2.2.2	Pre-established session.....	79
6.3.2.2.3	SIP INVITE request towards the terminating MCPTT client.....	80
6.3.2.2.4	Response to a SIP INVITE request	80
6.3.2.2.4.1	Provisional response	80
6.3.2.2.4.2	Final response	80
6.3.2.2.5	Automatic Commencement Mode.....	81
6.3.2.2.5.1	General.....	81
6.3.2.2.5.2	Automatic commencement for On-Demand session	81
6.3.2.2.5.3	Automatic commencement for pre-established session	83
6.3.2.2.6	Manual Commencement Mode	84
6.3.2.2.6.1	General.....	84
6.3.2.2.6.2	Manual commencement for On-Demand session	84
6.3.2.2.6.3	Manual commencement for Pre-established session.....	85
6.3.2.2.7	SIP MESSAGE request towards the terminating MCPTT client	87
6.3.2.2.8	SIP BYE request towards the terminating MCPTT client.....	87
6.3.2.2.8.1	On-demand.....	87
6.3.2.2.8.2	Using pre-established session	88
6.3.2.2.9	Populate MIME bodies.....	88
6.3.2.2.10	Generating a SIP re-INVITE request towards the terminating MCPTT client.....	88
6.3.2.2.11	Generating a SIP MESSAGE request towards the terminating MCPTT client.....	88
6.3.2.3	Processing I_MESSAGES containing MKFC and MKFC-ID	89
6.3.2.3.1	General	89
6.3.2.3.2	Processing an I_MESSAGE containing MKFC and MKFC-ID.....	89
6.3.3	Controlling MCPTT function	90
6.3.3.1	Request initiated by the controlling MCPTT function	90
6.3.3.1.1	SDP offer generation	90
6.3.3.1.2	Sending an INVITE request	90
6.3.3.1.3	Receipt of a SIP response to a SIP INVITE request.....	91
6.3.3.1.3.1	Final response	91
6.3.3.1.4	Sending a SIP MESSAGE request	91
6.3.3.1.5	Sending a SIP BYE request.....	91
6.3.3.1.6	Sending a SIP re-INVITE request for MCPTT emergency group call.....	92
6.3.3.1.7	Sending a SIP INVITE request for MCPTT emergency group call	92
6.3.3.1.8	Sending a SIP UPDATE request for Resource-Priority header field correction.....	94
6.3.3.1.9	Generating a SIP re-INVITE request.....	94
6.3.3.1.10	Generating a SIP re-INVITE request to cancel an in-progress emergency	95
6.3.3.1.11	Generating a SIP MESSAGE request for notification of in-progress emergency or imminent peril status change	95
6.3.3.1.12	Populate mcptt-info and location-info MIME bodies for emergency alert.....	95
6.3.3.1.13	Authorisations	96
6.3.3.1.13.1	Determining authorisation for initiating an MCPTT emergency alert	96
6.3.3.1.13.2	Determining authorisation for initiating an MCPTT emergency group or private call.....	97

6.3.3.1.13.3	Determining authorisation for cancelling an MCPTT emergency alert	98
6.3.3.1.13.4	Determining authorisation for cancelling an MCPTT emergency call	98
6.3.3.1.13.5	Determining authorisation for initiating an MCPTT imminent peril call	98
6.3.3.1.13.6	Determining authorisation for cancelling an MCPTT imminent peril call	99
6.3.3.1.13.7	Sending a SIP OPTIONS request to authorise an MCPTT user at a non-controlling MCPTT function of a MCPTT group	99
6.3.3.1.14	Generating a SIP 403 response for priority call request rejection	101
6.3.3.1.15	Sending a SIP re-INVITE request for MCPTT imminent peril group call	101
6.3.3.1.16	Handling the expiry of timer TNG2 (in-progress emergency group call timer)	102
6.3.3.1.17	Validate priority request parameters	102
6.3.3.1.18	Sending a SIP INFO request in the dialog of a SIP request for a priority call	103
6.3.3.1.19	Retrieving Resource-Priority header field values	103
6.3.3.1.20	Generating a SIP MESSAGE request to indicate successful receipt of an emergency alert or emergency cancellation	104
6.3.3.2	Requests terminated by the controlling MCPTT function	104
6.3.3.2.1	SDP answer generation	104
6.3.3.2.2	Receipt of a SIP INVITE request	105
6.3.3.2.3	Sending a SIP response to a SIP INVITE request	105
6.3.3.2.3.1	Provisional response	105
6.3.3.2.3.2	Final response	105
6.3.3.2.4	Receiving a SIP BYE request	106
6.3.3.3	Handling of the acknowledged call setup timer (TNG1)	106
6.3.3.4	Generating a SIP NOTIFY request	108
6.3.3.5	Handling of the group call timer (TNG3)	109
6.3.3.5.1	General	109
6.3.3.5.2	Interaction with the in-progress emergency group call timer (TNG2)	110
6.3.3.6	Generation of I_MESSAGES containing MKFC and MKFC-ID	110
6.3.3.6.1	General	110
6.3.3.6.2	Creation of an I_MESSAGE containing MKFC	110
6.3.4	Non-controlling MCPTT function of an MCPTT group	111
6.3.4.1	Request initiated by the non-controlling MCPTT function of an MCPTT group	111
6.3.4.1.1	SDP offer generation	111
6.3.4.1.2	Sending an INVITE request towards the MCPTT client	111
6.3.4.1.3	Sending a SIP INFO request	112
6.3.4.1.4	Sending an INVITE request towards the controlling MCPTT function	113
6.3.4.2	Requests terminated by the non-controlling MCPTT function of an MCPTT group	114
6.3.4.2.1	SDP answer generation	114
6.3.4.2.2	Sending a SIP response to the SIP INVITE request	114
6.3.4.2.2.1	Sending a SIP 183 (Session Progress) response	114
6.3.4.2.2.2	Sending a SIP 200 (OK) response	114
6.3.4.3	Generating a SIP NOTIFY request	115
6.3.4.4	Generating an I_MESSAGE containing MKFC	115
6.3.4.4.1	General	115
6.3.4.4.2	Creation of an I_MESSAGE containing MKFC	116
6.3.5	Retrieving and processing a group document	116
6.3.5.1	General	116
6.3.5.2	Rules for retrieving Group Document(s)	117
6.3.5.3	Rules for joining a group session	120
6.3.5.4	Rules for initiating a prearranged group session	120
6.3.5.5	Determining the group members to invite	121
6.3.6	Affiliation check	121
6.3.7	Error handling	122
6.3.7.1	Public service identity does not exist	122
6.3.8	Session release policy	122
6.3.8.1	Session release policy for group call	122
6.3.8.2	Session release policy for private call	122
6.4	Implicit floor request	122
6.5	Handling of MIME bodies in a SIP message	123
6.6	Confidentiality and Integrity Protection	124
6.6.1	General	124
6.6.1.1	Applicability and exclusions	124
6.6.1.2	Performing XML content encryption	124

6.6.1.3	Performing integrity protection on an XML body	124
6.6.1.4	Verifying integrity of an XML body and decrypting XML elements	124
6.6.2	Confidentiality Protection	125
6.6.2.1	General	125
6.6.2.2	Keys used in confidentiality protection procedures	125
6.6.2.3	Procedures for sending confidentiality protected content	125
6.6.2.3.1	MCPTT client	125
6.6.2.3.2	MCPTT server	126
6.6.2.3.3	Content Encryption in XML elements	126
6.6.2.3.4	Attribute URI Encryption	126
6.6.2.4	Procedures for receiving confidentiality protected content	127
6.6.2.4.1	Determination of confidentiality protected content	127
6.6.2.4.2	Decrypting confidentiality protected content in XML elements	127
6.6.2.4.3	Decrypting confidentiality protected URIs in XML attributes	127
6.6.2.5	MCPTT server copying received XML content	128
6.6.3	Integrity Protection of XML documents	128
6.6.3.1	General	128
6.6.3.2	Keys used in integrity protection procedures	130
6.6.3.3	Sending integrity protected content	131
6.6.3.3.1	MCPTT client	131
6.6.3.3.2	MCPTT server	131
6.6.3.3.3	Integrity protection procedure	131
6.6.3.4	Receiving integrity protected content	132
6.6.3.4.1	Determination of integrity protected content	132
6.6.3.4.2	Verification of integrity protected content	132
6.7	Priority sharing	132
7	Registration and service authorisation	132
7.1	General	132
7.2	MCPTT client procedures	132
7.2.1	SIP REGISTER request for service authorisation	132
7.2.1AA	SIP REGISTER request without service authorisation	134
7.2.1A	Common SIP PUBLISH procedure	134
7.2.2	SIP PUBLISH request for service authorisation and MCPTT service settings	134
7.2.3	Sending SIP PUBLISH for MCPTT service settings only	135
7.3	MCPTT server procedures	136
7.3.1	General	136
7.3.1A	Confidentiality and Integrity Protection	136
7.3.2	SIP REGISTER request for service authorisation	138
7.3.3	SIP PUBLISH request for service authorisation and service settings	138
7.3.4	Receiving SIP PUBLISH request for MCPTT service settings only	139
7.3.5	Receiving SIP PUBLISH request with "Expires=0"	140
8	Pre-established session	140
8.1	General	140
8.1A	Participating MCPTT function use of resource sharing	141
8.2	Session establishment	141
8.2.1	MCPTT client procedures	141
8.2.2	Participating MCPTT function procedures	142
8.3	Session modification	143
8.3.1	MCPTT client procedures	143
8.3.1.1	MCPTT client initiated	143
8.3.1.2	Participating MCPTT function initiated	144
8.3.2	Participating MCPTT function procedures	144
8.3.2.1	MCPTT client initiated	144
8.3.2.2	Participating MCPTT function initiated	144
8.4	Session release	145
8.4.1	MCPTT client procedures	145
8.4.1.1	MCPTT client initiated	145
8.4.1.2	Participating MCPTT function initiated	145
8.4.2	Participating MCPTT function procedures	145
8.4.2.1	MCPTT client initiated	145

8.4.2.2	Participating MCPTT function initiated.....	146
9	Affiliation.....	146
9.1	General.....	146
9.2	Procedures.....	147
9.2.1	MCPTT client procedures.....	147
9.2.1.1	General.....	147
9.2.1.2	Affiliation status change procedure.....	147
9.2.1.3	Affiliation status determination procedure.....	148
9.2.1.4	Procedure for sending affiliation status change request in negotiated mode to target MCPTT user... 149	
9.2.1.5	Procedure for receiving affiliation status change request in negotiated mode from authorized MCPTT user.....	150
9.2.2	MCPTT server procedures.....	150
9.2.2.1	General.....	150
9.2.2.2	Procedures of MCPTT server serving the MCPTT user.....	150
9.2.2.2.1	General.....	150
9.2.2.2.2	Stored information.....	151
9.2.2.2.3	Receiving affiliation status change from MCPTT client procedure.....	151
9.2.2.2.4	Receiving subscription to affiliation status procedure.....	154
9.2.2.2.5	Sending notification of change of affiliation status procedure.....	155
9.2.2.2.6	Sending affiliation status change towards MCPTT server owning MCPTT group procedure.....	155
9.2.2.2.7	Affiliation status determination from MCPTT server owning MCPTT group procedure.....	157
9.2.2.2.8	Procedure for authorizing affiliation status change request in negotiated mode sent to served MCPTT user.....	159
9.2.2.2.9	Forwarding affiliation status change towards another MCPTT user procedure.....	160
9.2.2.2.10	Forwarding subscription to affiliation status towards another MCPTT user procedure.....	161
9.2.2.2.11	Affiliation status determination.....	161
9.2.2.2.12	Affiliation status change by implicit affiliation.....	162
9.2.2.2.13	Implicit affiliation status change completion.....	163
9.2.2.2.14	Implicit affiliation status change cancellation.....	163
9.2.2.2.15	Implicit affiliation to configured groups procedure.....	164
9.2.2.3	Procedures of MCPTT server owning the MCPTT group.....	165
9.2.2.3.1	General.....	165
9.2.2.3.2	Stored information.....	166
9.2.2.3.3	Receiving group affiliation status change procedure.....	166
9.2.2.3.4	Receiving subscription to affiliation status procedure.....	168
9.2.2.3.5	Sending notification of change of affiliation status procedure.....	168
9.2.2.3.6	Implicit affiliation eligibility check procedure.....	169
9.2.2.3.7	Affiliation status change by implicit affiliation procedure.....	169
9.3	Coding.....	170
9.3.1	Extension of application/pidf+xml MIME type.....	170
9.3.1.1	Introduction.....	170
9.3.1.2	Syntax.....	170
9.3.2	Extension of application/simple-filter+xml MIME type.....	172
9.3.2.1	Introduction.....	172
9.3.2.2	Syntax.....	172
10	Group call.....	173
10.0	General.....	173
10.1	On-network group call.....	174
10.1.1	Prearranged group call.....	174
10.1.1.1	General.....	174
10.1.1.2	MCPTT client procedures.....	174
10.1.1.2.1	On-demand prearranged group call.....	174
10.1.1.2.1.1	Client originating procedures.....	174
10.1.1.2.1.2	Client terminating procedures.....	175
10.1.1.2.1.3	MCPTT upgrade to in-progress emergency or imminent peril.....	177
10.1.1.2.1.4	MCPTT in-progress emergency cancel.....	178
10.1.1.2.1.5	MCPTT in-progress imminent peril cancel.....	179
10.1.1.2.1.6	MCPTT client receives SIP re-INVITE request.....	180
10.1.1.2.2	Prearranged group call using pre-established session.....	182
10.1.1.2.2.1	Client originating procedures.....	182

10.1.1.2.2.2	Client terminating procedures.....	182
10.1.1.2.3	End group call	182
10.1.1.2.3.1	Client originating procedures on-demand.....	182
10.1.1.2.3.2	Client originating procedures using pre-established session.....	182
10.1.1.2.3.3	Client terminating procedures.....	183
10.1.1.2.4	Re-join procedure	183
10.1.1.2.4.1	On demand session establishment.....	183
10.1.1.2.4.2	Pre-established session.....	183
10.1.1.3	Participating MCPTT function procedures	183
10.1.1.3.1	Originating procedures	183
10.1.1.3.1.1	On demand prearranged group call.....	183
10.1.1.3.1.2	Prearranged group call using pre-established session.....	186
10.1.1.3.1.3	Reception of a SIP re-INVITE request from served MCPTT client	189
10.1.1.3.2	Terminating Procedures.....	190
10.1.1.3.3	End group call at the originating participating MCPTT function.....	191
10.1.1.3.3.1	Receipt of SIP BYE request for ending group call on-demand	191
10.1.1.3.3.2	Receipt of SIP REFER "BYE" request for ending group call using pre-established session... 191	
10.1.1.3.4	End group call at the terminating participating MCPTT function	191
10.1.1.3.4.1	Receipt of SIP BYE request for private call on-demand	191
10.1.1.3.4.2	Receipt of SIP BYE request when ongoing pre-established session.....	191
10.1.1.3.5	Re-join procedures.....	191
10.1.1.3.5.1	Originating procedures - on demand prearranged group call.....	191
10.1.1.3.5.2	Originating procedures - prearranged group call using pre-established session	191
10.1.1.3.6	Reception of a SIP re-INVITE request for terminating MCPTT client for priority call.....	192
10.1.1.4	Controlling MCPTT function procedures	192
10.1.1.4.1	Originating Procedures	192
10.1.1.4.1.1	INVITE targeted to an MCPTT client	192
10.1.1.4.1.2	INVITE targeted to the non-controlling MCPTT function of an MCPTT group.....	194
10.1.1.4.2	Terminating Procedures.....	195
10.1.1.4.3	End group call at the terminating controlling MCPTT function.....	203
10.1.1.4.4	End group call initiated by the controlling MCPTT function.....	203
10.1.1.4.4.1	General.....	203
10.1.1.4.4.2	SIP BYE request for releasing MCPTT session for a group call	203
10.1.1.4.4.3	SIP BYE request toward a MCPTT client	204
10.1.1.4.5	Re-join procedures.....	204
10.1.1.4.5.1	Terminating procedures	204
10.1.1.4.6	Late call entry initiated by controlling MCPTT function	205
10.1.1.4.7	Receipt of a SIP re-INVITE request.....	205
10.1.1.4.8	Handling of a SIP re-INVITE request for imminent peril session.....	208
10.1.1.5	Non-controlling function of an MCPTT group procedures.....	210
10.1.1.5.1	Originating procedures	210
10.1.1.5.2	Terminating procedures.....	211
10.1.1.5.2.1	General.....	211
10.1.1.5.2.2	Initiating a prearranged group call	211
10.1.1.5.2.3	Joining an ongoing prearranged group call.....	213
10.1.1.5.2.4	Splitting an ongoing prearranged group call.....	214
10.1.1.5.3	Rejoin procedures.....	214
10.1.1.5.3.1	Terminating procedures	214
10.1.1.5.3.2	Late call entry initiated by non-controlling MCPTT function	215
10.1.1.5.4	SIP OPTIONS request authorization procedure	215
10.1.1.5.5	Initiating a temporary group session.....	216
10.1.2	Chat group (restricted) call	217
10.1.2.1	General	217
10.1.2.2	MCPTT client procedures	217
10.1.2.2.1	On-demand chat group call.....	217
10.1.2.2.1.1	MCPTT client joins a chat MCPTT group session	217
10.1.2.2.1.2	MCPTT client receives SIP re-INVITE request	219
10.1.2.2.1.3	MCPTT in-progress emergency cancel.....	220
10.1.2.2.1.4	MCPTT upgrade to in-progress emergency or imminent peril	221
10.1.2.2.1.5	MCPTT in-progress imminent peril cancel.....	222
10.1.2.2.1.6	MCPTT client receives a SIP INVITE request for an MCPTT group call.....	223
10.1.2.2.2	Chat group call within a pre-established session	225

10.1.2.2.2.1	MCPTT client joins a chat MCPTT group session	225
10.1.2.2.3	End chat session	227
10.1.2.2.3.1	Client originating procedures on-demand	227
10.1.2.2.3.2	Client originating procedures using pre-established session	227
10.1.2.2.3.3	Client terminating procedures	227
10.1.2.3	Participating MCPTT function procedures	227
10.1.2.3.1	On-demand chat group call	227
10.1.2.3.1.1	MCPTT chat session establishment	227
10.1.2.3.1.2	Reception of a SIP re-INVITE request from served MCPTT client	229
10.1.2.3.1.3	Reception of a SIP INVITE request for terminating MCPTT client	230
10.1.2.3.1.4	Reception of a SIP re-INVITE request for terminating MCPTT client	231
10.1.2.3.2	Chat group call within a pre-established session	232
10.1.2.3.2.1	MCPTT chat session establishment	232
10.1.2.3.2.2	MCPTT chat session establishment for terminating user within a pre-established session	235
10.1.2.3.3	End group call at the originating participating MCPTT function	236
10.1.2.3.3.1	Receipt of SIP BYE request for ending on-demand chat session	236
10.1.2.3.3.2	Receipt of SIP REFER "BYE" request for ending chat session using pre-established session	236
10.1.2.3.4	End group call at the terminating participating MCPTT function	236
10.1.2.3.4.1	Receipt of SIP BYE request for on-demand chat session	236
10.1.2.3.4.2	Receipt of SIP BYE request for ongoing pre-established session	236
10.1.2.4	Controlling MCPTT function procedures	236
10.1.2.4.1	On-demand chat group call	236
10.1.2.4.1.1	MCPTT chat session establishment	236
10.1.2.4.1.2	Receipt of a SIP re-INVITE request	240
10.1.2.4.1.3	Handling of a SIP re-INVITE request for imminent peril session	244
10.1.2.4.2	End group call at the terminating controlling MCPTT function	246
10.1.2.4.3	End group call initiated by the controlling MCPTT function	246
10.1.2.4.3.1	General	246
10.1.2.4.3.2	SIP BYE request for releasing MCPTT session for a group call	246
10.1.2.4.3.3	SIP BYE request toward a MCPTT client	246
10.1.2.5	Non-controlling function of an MCPTT group procedures	247
10.1.2.5.1	Terminating procedures	247
10.1.2.5.1.1	General	247
10.1.2.5.1.2	Initiating a chat group session	247
10.1.2.5.1.3	Joining an ongoing chat group call	248
10.1.2.5.1.4	Splitting an ongoing chat group call	248
10.1.2.5.1.5	MCPTT client joining the temporary group chat session	249
10.1.2.5.1.6	Receipt of a SIP re-INVITE request from an MCPTT client	249
10.1.2.5.1.7	SIP OPTIONS request authorization procedure	249
10.1.2.5.1.8	Initiating a temporary group session	249
10.1.3	Subscription to the conference event package	250
10.1.3.1	General	250
10.1.3.2	MCPTT client	251
10.1.3.3	Participating MCPTT function	252
10.1.3.4	Controlling MCPTT function	253
10.1.3.4.1	Receiving a subscription to the conference event package	253
10.1.3.4.2	Sending notifications to the conference event package	253
10.1.3.4.3	Sending subscriptions to the conference event package	254
10.1.3.4.4	Terminating a subscription	255
10.1.3.5	Non-controlling MCPTT function	255
10.1.3.5.1	Receiving subscriptions to the conference event package	255
10.1.3.5.2	Sending notifications to the conference event package	256
10.1.3.5.3	Sending a subscription to the conference event package	256
10.1.3.5.4	Terminating a subscription	257
10.2	Off-network group call	257
10.2.1	General	257
10.2.1.1	Common Procedures	257
10.2.1.1.1	MONP message transport	257
10.2.1.1.2	Session description	257
10.2.2	Basic call control	258
10.2.2.1	General	258

10.2.2.2	Basic call control state machine	259
10.2.2.3	Call Control states	259
10.2.2.3.1	S1: start-stop	259
10.2.2.3.2	S2: waiting for call announcement	260
10.2.2.3.3	S3: part of ongoing call	260
10.2.2.3.4	S4: pending user action without confirm indication	260
10.2.2.3.5	S5: pending user action with confirm indication	260
10.2.2.3.6	S6: ignoring incoming call announcements	260
10.2.2.3.7	S7: waiting for call announcement after call release	260
10.2.2.4	Procedures	260
10.2.2.4.1	General	260
10.2.2.4.1.1	Call announcement timer calculation	260
10.2.2.4.1.1.1	Periodic call announcement timer calculation	260
10.2.2.4.1.1.2	Call announcement timer calculation after CALL PROBE	260
10.2.2.4.1.2	Max duration timer calculation	261
10.2.2.4.2	Call Probe	261
10.2.2.4.2.1	Call probe initiation	261
10.2.2.4.2.2	Call probe retransmission	261
10.2.2.4.2.3	Receiving GROUP CALL PROBE message when participating in the ongoing call	261
10.2.2.4.3	Call setup	262
10.2.2.4.3.1	Not receiving any response to GROUP CALL PROBE message	262
10.2.2.4.3.2	Receiving a GROUP CALL ANNOUNCEMENT message	262
10.2.2.4.3.3	Receiving a GROUP CALL ANNOUNCEMENT message when not participating in the ongoing call	263
10.2.2.4.3.4	MCPTT user accepts the terminating call with confirm indication	264
10.2.2.4.3.5	MCPTT user accepts the terminating call without confirm indication	264
10.2.2.4.3.6	Receiving GROUP CALL ACCEPT message	265
10.2.2.4.3.7	MCPTT user rejects the terminating call	265
10.2.2.4.3.8	MCPTT user does not act on terminating call	265
10.2.2.4.4	Periodic group call announcement	265
10.2.2.4.4.1	Sending periodic call announcement	265
10.2.2.4.4.2	Receiving periodic call announcement	266
10.2.2.4.5	Call release	266
10.2.2.4.5.1	MCPTT user leaves the call when GROUP CALL ANNOUNCEMENT was sent or received	266
10.2.2.4.5.2	Receiving GROUP CALL ANNOUNCEMENT message for rejected or released call	266
10.2.2.4.5.3	MCPTT user initiates originating call for rejected or released call	267
10.2.2.4.5.4	No GROUP CALL ANNOUNCEMENT messages for rejected or released call	267
10.2.2.4.5.5	MCPTT user leaves the call when GROUP CALL PROBE was sent	267
10.2.2.4.5.6	MCPTT user initiates originating call for released call	268
10.2.2.4.5.7	Receiving GROUP CALL ANNOUNCEMENT message for released call	268
10.2.2.4.5.8	No GROUP CALL ANNOUNCEMENT messages for released call	268
10.2.2.4.5.9	Max duration reached	268
10.2.2.4.6	Merge of calls	269
10.2.2.4.6.1	Merge of two calls	269
10.2.2.4.7	Error handling	270
10.2.2.4.7.1	Unexpected MONP message received	270
10.2.2.4.7.2	Unexpected indication from MCPTT user	270
10.2.2.4.7.3	Unexpected expiration of a timer	270
10.2.3.	Call type control	270
10.2.3.1	General	270
10.2.3.2	Call type control state machine	270
10.2.3.3	Call type control states	272
10.2.3.3.1	T0: waiting for call to establish	272
10.2.3.3.2	T1: in-progress emergency group call	272
10.2.3.3.3	T2: in-progress basic group call	272
10.2.3.3.4	T3: in-progress imminent peril group call	272
10.2.3.4	Procedures	272
10.2.3.4.1	General	272
10.2.3.4.1.1	Implicit downgrade (emergency) timer calculation	272
10.2.3.4.1.2	Implicit downgrade (imminent peril) timer calculation	272
10.2.3.4.2	User initiated the call probe	272

10.2.3.4.3	Received GROUP CALL ANNOUNCEMENT message as a response to GROUP CALL PROBE message.....	273
10.2.3.4.4	Received GROUP CALL ANNOUNCEMENT with MCPTT user acknowledgement required..	274
10.2.3.4.5	Received GROUP CALL ANNOUNCEMENT without MCPTT user acknowledgement required.....	275
10.2.3.4.6	Call started.....	275
10.2.3.4.7	Upgrade call	276
10.2.3.4.7.1	Originating user upgrading the call.....	276
10.2.3.4.7.2	Terminating UE receiving a GROUP CALL ANNOUNCEMENT message when participating in the ongoing call.....	277
10.2.3.4.8	Downgrade call.....	279
10.2.3.4.8.1	Originating user downgrading emergency group call	279
10.2.3.4.8.2	Retransmitting GROUP CALL EMERGENCY END	280
10.2.3.4.8.3	Terminating user downgrading emergency group call.....	280
10.2.3.4.8.4	Originating user downgrading imminent peril group call	280
10.2.3.4.8.5	Retransmitting GROUP CALL IMMINENT PERIL END	281
10.2.3.4.8.6	Terminating user downgrading imminent peril group call.....	281
10.2.3.4.8.7	Void	282
10.2.3.4.8.8	Implicit emergency priority end.....	282
10.2.3.4.8.9	Implicit imminent peril priority end.....	282
10.2.3.4.9	Merge of two calls	282
10.2.3.4.10	Call release after call establishment	283
10.2.3.4.11	Call release or reject before call establishment	283
10.2.3.4.12	Error handling.....	284
10.2.3.4.12.1	Unexpected MONP message received.....	284
10.2.3.4.12.2	Unexpected indication from MCPTT user.....	284
10.2.3.4.12.3	Unexpected expiration of a timer.....	284
10.3	Off-network Broadcast group call	284
10.3.1	General.....	284
10.3.2	Basic call control	284
10.3.2.1	General	284
10.3.2.2	Broadcast group call control state machine.....	284
10.3.2.3	Broadcast group call Control states.....	285
10.3.2.3.1	B1: start-stop	285
10.3.2.3.2	B2: in-progress broadcast group call.....	285
10.3.2.3.3	B3: pending user action	285
10.3.2.3.4	B4: ignoring same call ID.....	285
10.3.2.4	Procedures.....	286
10.3.2.4.1	User initiating a broadcast group call	286
10.3.2.4.2	Terminating UE receiving a GROUP CALL BROADCAST message when not participating in the in-progress broadcast group call.....	286
10.3.2.4.3	MCPTT user accepts the terminating call.....	287
10.3.2.4.4	MCPTT user rejects the terminating call.....	287
10.3.2.4.5	MCPTT user does not act on terminating call	287
10.3.2.4.6	Terminating user releasing the call.....	287
10.3.2.4.7	Originating user releasing the call	288
10.3.2.4.8	Receiving GROUP CALL BROADCAST END message	288
10.3.2.4.9	Originating UE retransmitting GROUP CALL BROADCAST message.....	288
10.3.2.4.10	Ignoring same call ID	289
10.3.2.4.11	Releasing the call.....	289
10.3.2.4.12	Restarting TFB1	289
10.3.2.4.13	Receiving GROUP CALL BROADCAST END message	289
10.3.2.4.14	Error handling.....	290
10.3.2.4.14.1	Unexpected MONP message received.....	290
10.3.2.4.14.2	Unexpected indication from MCPTT user.....	290
10.3.2.4.14.3	Unexpected expiration of a timer.....	290
11	Private call.....	290
11.0	General	290
11.1	On-network private call.....	290
11.1.1	Private call with floor control	290
11.1.1.1	General.....	290