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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee TETRA and Critical Communications Evolution (TCCE).

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).

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1 Scope

The present document specifies interoperability tests with the purpose of supporting the Mission Critical Push To Talk (MCPTT) Plugtests™ events.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

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The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 122 179 (V13.3.0): "Universal Mobile Telecommunications System (UMTS); LTE; Mission Critical Push to Talk (MCPTT) over LTE; Stage 1 (3GPP TS 22.179 version 13.3.0 Release 13)".

[2] ETSI TS 123 179 (V13.4.0): "LTE; Functional architecture and information flows to support mission critical communication services; Stage 2 (3GPP TS 23.179 version 13.4.0 Release 13)".

[3] ETSI TS 124 229 (V13.8.0): "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 version 13.8.0 Release 13)".

[4] ETSI TS 124 379 (V13.3.0): "LTE; Mission Critical Push To Talk (MCPTT) call control; Protocol specification (3GPP TS 24.379 version 13.3.0 Release 13)".

[5] ETSI TS 124 380 (V13.3.0): "LTE; Mission Critical Push To Talk (MCPTT) media plane control; Protocol specification (3GPP TS 24.380 version 13.3.0 Release 13)".

[6] ETSI TS 124 481 (V13.3.0): "LTE; Mission Critical Services (MCS) group management; Protocol specification (3GPP TS 24.481 version 13.3.0 Release 13)".

[7] ETSI TS 124 482 (V13.2.0): "LTE; Mission Critical Services (MCS) identity management; Protocol specification (3GPP TS 24.482 version 13.2.0 Release 13)".

[8] ETSI TS 124 484 (V13.3.0): "LTE; Mission Critical Services (MCS) configuration management; Protocol specification (3GPP TS 24.484 version 13.3.0 Release 13)".

[9] ETSI TS 126 179 (V13.2.0): "LTE; Mission Critical Push To Talk (MCPTT); Codecs and media handling (3GPP TS 26.179 version 13.2.0 Release 13)".

[10] ETSI TS 126 346 (V13.6.0): "Universal Mobile Telecommunications System (UMTS); LTE; Multimedia Broadcast/Multicast Service (MBMS); Protocols and codecs (3GPP TS 26.346 version 13.6.0 Release 13)".

[11] ETSI TS 129 212 (V13.8.0): "Universal Mobile Telecommunications System (UMTS); LTE; Policy and Charging Control (PCC); Reference points (3GPP TS 29.212 version 13.8.0 Release 13)".

[12] ETSI TS 129 214 (V13.8.0): "Universal Mobile Telecommunications System (UMTS); LTE; Policy and charging control over Rx reference point (3GPP TS 29.214 version 13.8.0 Release 13)".

[13] ETSI TS 129 468 (V13.2.0): "Universal Mobile Telecommunications System (UMTS); LTE; Group Communication System Enablers for LTE (GCSE_LTE); MB2 reference point; Stage 3 (3GPP TS 29.468 version 13.2.0 Release 13)".

[14] ETSI TS 133 179 (V13.3.0): "LTE; Security of Mission Critical Push To Talk (MCPTT) over LTE (3GPP TS 33.179 version 13.3.0 Release 13)".

[15] IETF RFC 3515: "The Session Initiation Protocol (SIP) Refer Method", April 2003.

[16] IETF RFC 3856: "A Presence Event Package for the Session Initiation Protocol (SIP)", August 2004.

[17] IETF RFC 3903: "Session Initiation Protocol (SIP) Extension for Event State Publication", October 2004.

[18] IETF RFC 5373: "Requesting Answering Modes for the Session Initiation Protocol (SIP)", November 2008.

[19] IETF RFC 6665: "SIP-Specific Event Notification", July 2012.

[20] IETF RFC 7647: "Clarifications for the use of REFER with RFC6665", September 2015.

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

Not applicable.

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AFFIL	AFFILiation
AMR	Adaptative Multi-Rate audio codec
AMR-WB	Adaptative Multi-Rate audio codec Wideband
APN	Access Point Name
APP	Application
AS	Application Server
AVP	Attribute-Value Pairs
BM-SC	Broadcast Multicast Service Centre
CMS	Configuration Management Server
CN	CoNnectivity
CONN	CONNectivity
CSC	Common Services Core
CSCF	Call Session Control Function
DUT	Device Under Test
EMBMS	evolved Multimedia Broadcast Multicast Service
EPC	Evolved Packet Core
EPS	Evolved Packet System
EPS_GX	Policy and charging control over Gx reference point
EUT	Equipment Under Test
EUTRAN	Evolved Universal Terrestrial Radio Access Network
EVS	Enhanced Voice Services

FC	Floor Control
GCSE	Group Communication Service Enabler
GMS	Group Management Server
IdMS	Identity Management Server
IFS	Interoperable Functions Statement
IMPU	IP Multimedia PUblic identity
IMS	IP Multimedia Subsystem
IMS_RX	Policy and charging control over Rx reference point
IP	Internet Protocol
KMS	Key Management Server
LOC	Location
LTE-A	LTE-Advanced
MBMS	Multimedia Broadcast and Multicast Service
MC	Multicast
MCC	Mission Critical Communication
MCMC	Mission Critical MBMS subchannel Control Protocol
MCPC	Mission Critical MBMS subchannel Control Protocol
MCPTT ID	MCPTT user identity
MCPTT	Mission Critical Push-To-Talk
MNC	Mobile Network Code
NFC	No Floor Control
OAM	Operation And Maintenance
ONN	ON Network calls
OTT	Over The Top
PCC	Policy and Charging Control
PCRF	Policy and Charging Rules Function
PCSCF	Proxy Call Session Control Function
PSAP	Public Safety Answering Point
PSI	Public Service Identity
PTT	Push-To-Talk
QCI	QoS Class Identifier
RTP	Real-time Transport Protocol
RX	Rx Reference Point
SIP	Session Initiation Protocol
SUT	System Under Test
TD	Test Description
TMGI	Temporary Mobile Group Identity
TR	Technical Report
TS	Technical Specification
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
URI	Uniform Resource Identifier
WFC	With Floor Control

4 Conventions

4.1 Test Description Proforma

A Test Description (TD) is a detailed description of the process that needs to be followed to test one or more inter operable functionalities between two or more vendor implementations. A TD should include as a minimum the following elements: The following different types are defined.

Interoperability Test Description			
Identifier	a unique test description identifier should follow a well-defined naming convention, e.g.: TD/AB/XX/00		
Test Objective	a concise summary of the test, which should reflect its purpose and allow readers to easily distinguish this test from any other test in the present document		
Configuration(s)	• list of all the required equipment for running this test, possibly also including a (reference to) an illustration of a test architecture or test configuration		
References	• list of references to the base specification section(s), use case(s), requirement(s), etc. which are either used in the test or define the functionality being tested		
Applicability	• list of features and capabilities in the IFS which are required to be supported by the SUT in order to execute this test (e.g. if this list contains an optional feature to be supported, then the test is optional)		
Pre-test conditions	• list of test specific pre-conditions that need to be met by the SUT including information about equipment configuration, i.e. precise description of the initial state of the SUT prior to start executing the test sequence		
Test Sequence	**Step**	**Type**	**Description**
	1 2 3	*<type>*	*step description*
Notes	• optional list of explanatory notes		

- A **stimulus** corresponds to an event that triggers an EUT to proceed with a specific protocol action, like sending a message for instance.
- A **check** step consists of verifying that the EUT behaves according to the expected behaviour (for instance the EUT behaviour shows that it receives the expected message).
- A **configure** corresponds to an action to modify the EUT configuration.
- A **verify** step consists of verifying that the tested scenario provides expected results (for instance an emergency call is received at the correct PSAP and media is transmitted).

Each check step consists of the receipt of protocol messages on reference points, with valid content. The check should be performed using a trace created by a monitor tool.

4.2 Interoperable Functions Statement

The "Interoperable Functions Statement" (IFS) identifies the standardized functions of a DUT. These functions can be mandatory, optional or conditional (depending on other functions), and depend on the role played by the DUT. The IFS can also be used as a proforma by a vendor to identify the functions that its DUT will support when interoperating with corresponding functions from other vendors.

4.3 Test Overview

The following objectives shall be considered:

- Group Call (unicast)
- Group Call (eMBMS)
- Emergency Group Call
- Floor Control
- Registration and service authorization
- Affiliation

- Group Management
- Location

The basic structure comprises a MCPTT application server(s) -both controlling and participating- and MCPTT UEs deployed over a generic SIP Core/IMS, LTE access network with and without MCPTT required PCC capabilities and native multicast support (i.e. Release 13 eMBMS). Figure 1 illustrates the basic test infrastructure.

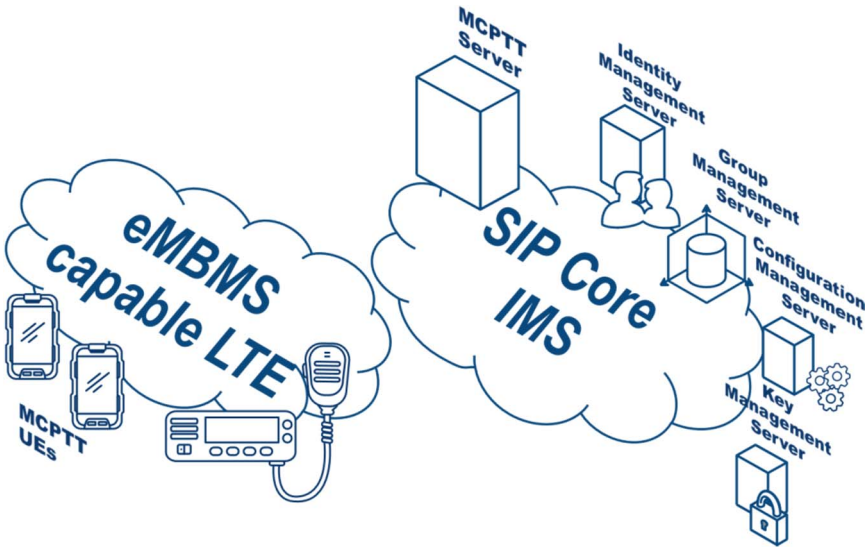

Figure 1: Basic Test Infrastructure

3GPP Release 13 has defined a comprehensive set of MCPTT Calls as shown in figure 2. A subset of all potential MCPTT calls are covered and the relevant configurations are defined in clause 5 and the relevant Test Cases are defined in clause 7.

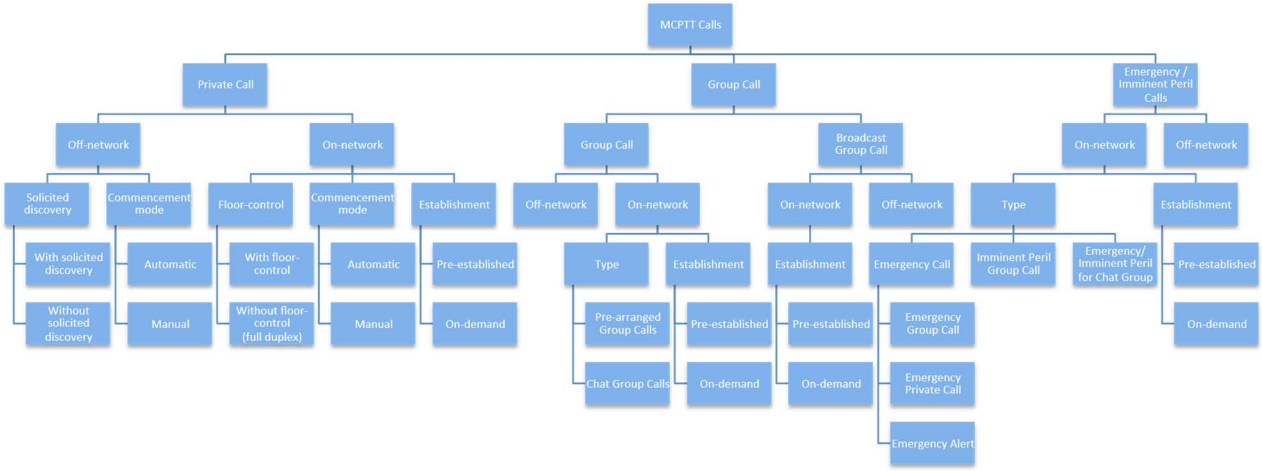

Figure 2: MCPTT call types

The following high level test objectives are covered in the present document:

- **Connectivity (CONN):** Tests cover basic connectivity between functional elements at different levels including Access Network (LTE), IP Network, SIP/IMS and MCPTT Application level. At LTE level, unicast and more particularly eMBMS multicast connectivity will be evaluated. IP layers targets pure OTT connectivity regardless the underlying access network. SIP connectivity tests check proper deployment of MCPTT AS over the selected SIP Core/IMS so that all SIP messages are successfully delivered from MCPTT UEs to Participating/Controlling MCPTT Servers and vice versa. Application level refers to e2e signalling, media, floor controlling (and other involved) protocols in use. All CONN tests could be tentatively evaluated over all the different configurations (see clause 5). Additionally, low level configuration-specific details (i.e. MCPTT and eMBMS bearer management) are considered in the PCC and EMBMS specific objectives.

- **Floor Controlling (FC):** Although basic Floor Controlling procedures will be tentatively evaluated during the tests associated with the first CONN objective, FC will entail comprehensive interoperability analysis of all defined interactions, including prioritization and pre-emptiveness mechanisms.
- **Policing (PCC):** Comprises specific checking proper LTE bearer signalling and allocation.
- **eMBMS (EMBMS):** Comprises checking of eMBMS specific signalling.
- **Registration and authorization (REGAUTH):** Comprises MCPTT Client registration.
- **Affiliation (affiliation):** Comprises MCPTT Client explicit and implicit affiliation.
- **Location (LOC):** Comprises Location configuration, retrieval and submission procedures.
- **OAM procedures (CSC):** Comprises OAM related IdMS, CMS, GMS and KMS interfacing procedures.
- **QoS support (KPI):** Comprises checking e2e QoS values fulfilling pre-defined thresholds for the defined KPIs.

The following lists define the test cases per test group. The test cases that are defined in clause 7.

- **Connectivity (CONN):**
  - CONN/GROUP/PREA/ONDEM/NFC/01 (clause 7.2.1)
    - On-demand prearranged Group Call (clauses 10.1.1.2.1, 10.1.1.3.1.1 and 10.1.1.4 in ETSI TS 124 379 [4])
  - CONN/GROUP/PREA/ONDEM/NFC/02 (clause 7.2.2)
    - On-demand prearranged Group Call (clauses 10.1.1.2.1, 10.1.1.3.1.1 and 10.1.1.4 in ETSI TS 124 379 [4]): Emergency Group Call (clauses 6.2.8.1.1 to 6.2.8.1.1.8 and 6.2.8.1.1.13 to 6.2.8.1.1.17 of ETSI TS 124 379 [4])
  - CONN/GROUP/PREA/ONDEM/NFC/03 (clause 7.2.3)
    - On-demand prearranged Group Call (clauses 10.1.1.2.1, 10.1.1.3.1.1 and 10.1.1.4 in ETSI TS 124 379 [4]): Imminent Peril Group Call (clauses 6.2.8.1.9 to 6.2.8.1.12 in ETSI TS 124 379 [4])
  - CONN/GROUP/PREA/ONDEM/NFC/04 (clause 7.2.4)
    - On-demand prearranged Group Call (clauses 10.1.1.2.1, 10.1.1.3.1.1 and 10.1.1.4 in ETSI TS 124 379 [4]): Broadcast Group Call (clause 6.2.8.2 in ETSI TS 124 379 [4])
  - CONN/GROUP/PREA/ONDEM/NFC/05 (clause 7.2.5)
    - On-demand prearranged Group Call (clauses 10.1.1.2.1, 10.1.1.3.1.1 and 10.1.1.4 in ETSI TS 124 379 [4]): Upgrade to in-progress emergency or imminent peril (clauses 10.1.1.2.1.3, 10.1.2.2.1.4 in ETSI TS 124 379 [4])
  - CONN/GROUP/PREA/ONDEM/NFC/06 (clause 7.2.6)
    - Termination of an on-demand prearranged Group Calls (clauses 10.1.1.2.3.1 and 10.1.1.3.3.1 in ETSI TS 124 379 [4])
  - CONN/GROUP/PREA/PRE/NFC/01 (clause 7.2.7)
    - Prearranged Group Call using pre-established session (clauses 10.1.1.2.2, 10.1.1.3.1.2 and 10.1.1.4 in ETSI TS 124 379 [4])
  - CONN/GROUP/PREA/PRE/NFC/02 (clause 7.2.8)
    - Termination of a prearranged Group Call using pre-established session (clauses 10.1.1.2.3.2 and 10.1.1.3.3.2 in ETSI TS 124 379 [4])

- CONN/GROUP/CHAT/ONDEM/NFC/01 (clause 7.2.9)
  - On-demand Chat Group Call establishment (clauses 10.1.2.2.1.1, 10.1.2.3.1.1, 10.1.2.3.1.3 and 10.1.2.4.1.1 in ETSI TS 124 379 [4])
- CONN/GROUP/CHAT/ONDEM/NFC/02 (clause 7.2.10)
  - Ongoing on-demand Chat Group Call upgraded to emergency call (clauses 10.1.2.2.1.4, 10.1.2.2.1.2, 10.1.2.3.1.2, 10.1.2.3.1.4 and 10.1.2.4.1.2 in ETSI TS 124 379 [4])
- CONN/GROUP/CHAT/ONDEM/NFC/03 (clause 7.2.11)
  - Ongoing on-demand Chat Group Call upgraded to imminent peril (clauses 10.1.2.2.1.4, 10.1.2.2.1.2, 10.1.2.3.1.2, 10.1.2.3.1.4 and 10.1.2.4.1.3 in ETSI TS 124 379 [4])
- CONN/GROUP/CHAT/ONDEM/NFC/04 (clause 7.2.12)
  - Cancellation of the in-progress emergency condition of an on-demand Chat Group Call (clauses 10.1.2.2.1.3, 10.1.2.2.1.2, 10.1.2.3.1.2, 10.1.2.3.1.4 and 10.1.2.4.1.2 in ETSI TS 124 379 [4])
- CONN/GROUP/CHAT/ONDEM/NFC/05 (clause 7.2.13)
  - Cancellation of the in-progress imminent peril condition of an on-demand Chat Group Call (clauses 10.1.2.2.1.5, 10.1.2.2.1.2, 10.1.2.3.1.2, 10.1.2.3.1.4 and 10.1.2.4.1.3 in ETSI TS 124 379 [4])
- CONN/GROUP/CHAT/PRE/NFC/01 (clause 7.2.14)
  - Chat Group Call establishment within a pre-established session (clauses 10.1.2.2.2, 10.1.2.2.1.6, 10.1.2.3.2.1, 10.1.2.3.2.2 and 10.1.2.4.1.1 in ETSI TS 124 379 [4])
- CONN/PRIV/AUTO/ONDEM/WFC/NFC/01 (clause 7.2.15)
  - On-demand private call with floor control (clause 11.1.1.2.1 in ETSI TS 124 379 [4]) and automatic commencement mode (see IETF RFC 5373 [18])
- CONN/PRIV/MAN/ONDEM/WFC/NFC/01 (clause 7.2.16)
  - On-demand private call with floor control manual mode (clause 11.1.1.2.1 in ETSI TS 124 379 [4]) and manual commencement mode (see IETF RFC 5373 [18])
- CONN/PRIV/AUTO/PRE/WFC/NFC/01 (clause 7.2.17)
  - Pre-established private call with floor control (clause 11.1.1.2.1 in ETSI TS 124 379 [4]) and automatic commencement mode (see IETF RFC 5373 [18])
- CONN/PRIV/MAN/PRE/WFC/NFC/01 (clause 7.2.18)
  - Pre-established private call with floor control manual mode (clause 11.1.1.2.1 in ETSI TS 124 379 [4]) and manual commencement mode (see IETF RFC 5373 [18])
- CONN/PRIV/AUTO/ONDEM/WOFC/01 (clause 7.2.19)
  - On-demand private call without floor control (clause 11.1.1.2.1 in ETSI TS 124 379 [4]) and automatic commencement mode (see IETF RFC 5373 [18])
- CONN/PRIV/MAN/ONDEM/WOFC/01 (clause 7.2.20)
  - On-demand private call without floor control manual mode (clause 11.1.1.2.1 in ETSI TS 124 379 [4]) and manual commencement mode (see IETF RFC 5373 [18])
- CONN/PRIV/AUTO/PRE/WOFC/01 (clause 7.2.21)
  - Pre-established private call without floor control (clause 11.1.1.2.1 in ETSI TS 124 379 [4]) and automatic commencement mode (see IETF RFC 5373 [18])

- CONN/PRIV/MAN/PRE/WOFC/01 (clause 7.2.22)
  - Pre-established private call without floor control manual mode (clause 11.1.1.2.1 in ETSI TS 124 379 [4]) and manual commencement mode (see IETF RFC 5373 [18])

- **Floor Controlling (FC):**
  - FC/BASIC/01 (clause 7.3.1)
    - Basic FC functionality (clause 6 in ETSI TS 124 380 [5])
  - FC/BASIC/02 (clause 7.3.2)
    - Basic FC functionality. Effect of Priorities (following the example in clause A.3.5 of ETSI TS 124 380 [5])

- **Registration & Authorization:**
  - REGAUTH/IDMSAUTH/01 (clause 7.4.1)
    - MCPTT Client authentication and tokens retrieval using IdMS [7]
  - REGAUTH/3PRTYREG/REGISTER/01 (clause 7.4.2)
    - MCPTT Client registration using 3rd party register (clauses 7.2.1 and 7.3.2 in ETSI TS 124 379 [4])
  - REGAUTH/PUBLISH/REGISTER/01 (clause 7.4.3)
    - MCPTT Client registration using SIP PUBLISH (clauses 7.2.2 and 7.3.2 in ETSI TS 124 379 [4])

- **Policing (PCC):**
  - PCC/BEARERSETUP/01 (clause 7.5.1)
    - Unicast MC Bearer Setup by SIP Core/IMS (clauses 4.4.1 and 4.4.2 in ETSI TS 129 214 [12])
  - PCC/BEARERSETUP/02 (clause 7.5.2)
    - Unicast MC Bearer Setup by MCPTT Participating AS (clauses 4.4.1 and 4.4.2 in ETSI TS 129 214 [12])
  - PCC/BEARERUPDATE/01 (clause 7.5.3)
    - Unicast MC Bearer Update by SIP Core/IMS due to a change in the Call characteristics (i.e. upgrade to emergency call as in clause 7.2.5)
  - PCC/BEARERUPDATE/02 (clause 7.5.4)
    - Unicast MC Bearer Update by MCPTT Participating AS due to a change in the Call characteristics (i.e. upgrade to emergency call as in clause 7.2.5)

- **EMBMS:**
  - EMBMS/ACTIVATEBEARER/WPRETMGI/01 (clause 7.6.2)
    - Use of dynamically established MBMS bearers in prearranged MCPTT group calls with pre-allocated TMGIs (clauses 5.2.1 and 5.3.2 in ETSI TS 129 468 [13])
      EMBMS/ACTIVATEBEARER/WOPRETMGI/01 (clause 7.6.3)
    - Use of dynamically established MBMS bearers in prearranged MCPTT group calls without pre-allocated TMGIs
  - EMBMS/PREBEARER/WPRETMGI/01 (clause 7.6.4)
    - Use of pre-established MBMS bearers in prearranged group calls with pre-allocated TMGIs

- EMBMS/PREBEARER/WOPRETMGI/01 (clause 7.6.5)
  - Use of pre-established MBMS bearers in prearranged group calls without pre-allocated TMGIs
- EMBMS/MODIFYBEARER/01 (clause 7.6.6)
  - Modification of MBMS bearers upon reception of emergency upgrade request
- EMBMS/DEACTIVBEARER/WTMGIDEA/01 (clause 7.6.7)
  - Deactivation of MBMS bearers after termination of a prearranged MCPTT group call with TMGI deallocation
- EMBMS/DEACTIVBEARER/WOTMGIDEA/01 (clause 7.6.8)
  - Deactivation of MBMS bearers after termination of a prearranged MCPTT group call without TMGI deallocation
- EMBMS/SWITCHTOUNITMGIEXP/01 (clause 7.6.9)
  - Switching to unicast bearer after TMGI expiration

- **Affiliations (AFFIL):**
  - AFFIL/DET/01 (clause 7.7.1)
    - Determining self-affiliation (clauses 9.2.1.3 and 9.2.2.2.4 in ETSI TS 124 379 [4])
  - AFFIL/DET/02 (clause 7.7.2)
    - Determining affiliation status of another user (clauses 9.2.1.3 and 9.2.2.2.4 in ETSI TS 124 379 [4])
  - AFFIL/CHANGE/01 (clause 7.7.3)
    - Affiliation status change triggered by the MCPTT User itself (clauses 9.2.1.2 and 9.2.2.2.3 in ETSI TS 124 379 [4])
  - AFFIL/CHANGE/02 (clause 7.7.4)
    - Affiliation status change triggered by another MCPTT User in mandatory mode (clauses 9.2.1.2 and 9.2.2.3.3 in ETSI TS 124 379 [4])
  - AFFIL/CHANGE/03 (clause 7.7.5)
    - Affiliation status change triggered by another MCPTT User in negotiated mode (clauses 9.2.1.4 and 9.2.1.5 in ETSI TS 124 379 [4])
- **Location (LOC):**
  - LOC/3PRTYREG/CONFIG/01 (clause 7.8.1)
    - MCPTT Client Configuration upon 3rd party register (clauses 13.2.2 and 13.3.2 in ETSI TS 124 379 [4])
  - LOC/REQUEST/01 (clause 7.8.1)
    - Request for Location Report to the MCPTT Client (clauses 13.2.3 and 13.3.3 in ETSI TS 124 379 [4])
  - LOC/SUBMISSION/01 (clause 7.8.3)
    - MCPTT Client Sends location upon trigger (clause 13.3.4 in ETSI TS 124 379 [4])

5 Configurations

5.1 Common remarks

The tests may be executed several times by permuting the role that each device plays. This depends on the support of the DUT of the Functional Connectivity Modes defined in clause 5.3.2 of ETSI TS 124 379 [4]. The following roles are possible:

A) Functions of the MCPTT server in the primary MCPTT system

B) The non-controlling function operating in the primary MCPTT system

C) Mutual aid relationship between the primary MCPTT system and a partner MCPTT system with the controlling MCPTT function in the primary MCPTT system

D) Mutual aid relationship between the primary MCPTT system and a partner MCPTT system with the controlling MCPTT function in the partner MCPTT system

E) Mutual aid relationship between the primary MCPTT system and a partner MCPTT system involving the use of a non-controlling MCPTT function of an MCPTT group in the partner MCPTT system

F) Mutual aid relationship between the primary MCPTT system and more than one partner MCPTT system

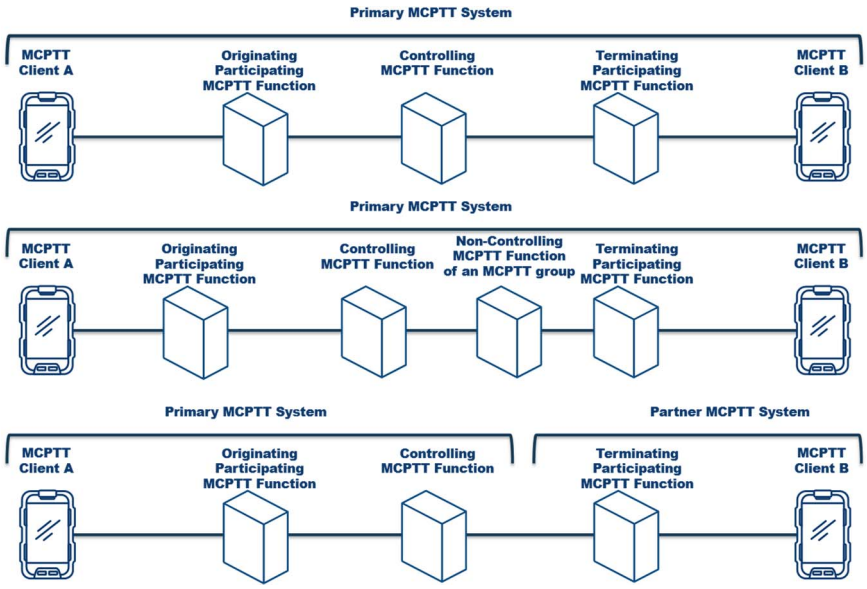

Figure 3: Functional connectivity modes (figures 5.3.2.1 to 5.3.2.3 of ETSI TS 124 379 [4])

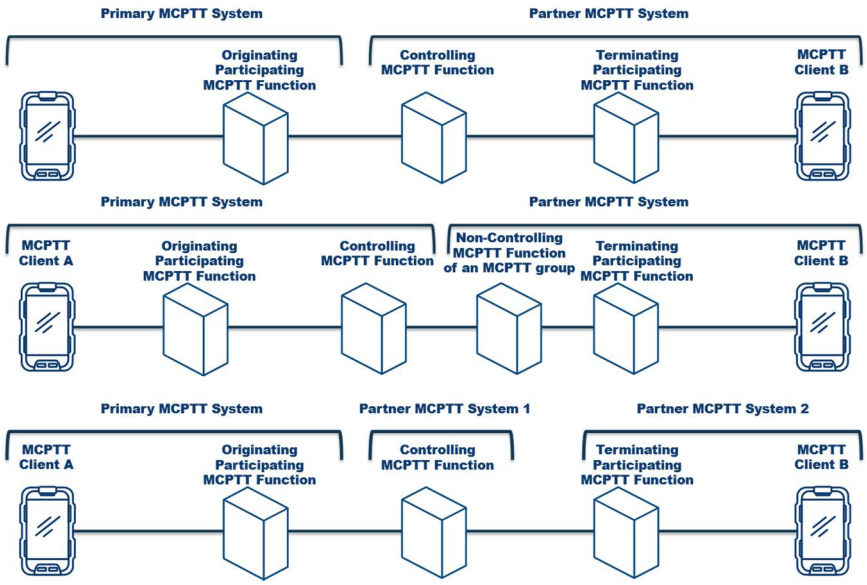

Figure 4: Functional connectivity modes (figures 5.3.2.4 to 5.3.2.6 of ETSI TS 124 379 [4])

5.2 CFG_ONN_OTT-1

CFG_ONN_OTT-1 is shown in figure 5.

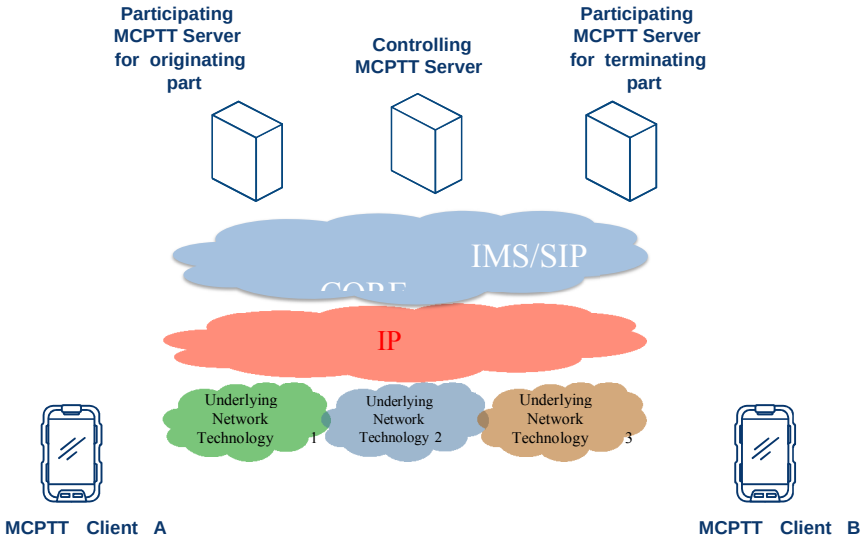

Figure 5: CFG_ONN_OTT-1 Scheme

MCPTT UEs, SIP Core/IMS and MCPTT Server(s) are required. It shall be used for On Network Calls (ONN) with a pure Over-The-Top (OTT) approach. Therefore, any underlying network (i.e. commercial LTE or even UMTS, WiFi or Ethernet) provides a bit-pipe type only access with no QoS/prioritization enforcement neither access-layer multi/broadcasting capabilities (i.e. nor unicast PCC support or multicast mechanisms in LTE). It can be also referred as a configuration comprised of "non-3GPP access connections" only.

This configuration, although not usable in a real Mission Critical (MC) environment (only by dispatchers as suggested in clause 4 in ETSI TS 122 179 [1]), shall be used for basic connectivity tests and does not require any binding between the SIP Core and the underlying LTE infrastructure (no Rx interface, plain OTT as in figure 5).

Additionally, figure 6 defines the different Interfaces in the Application plane considered in the configuration CFG_ONN_OTT-1 for the simplest unicast media handling and floor controlling case.

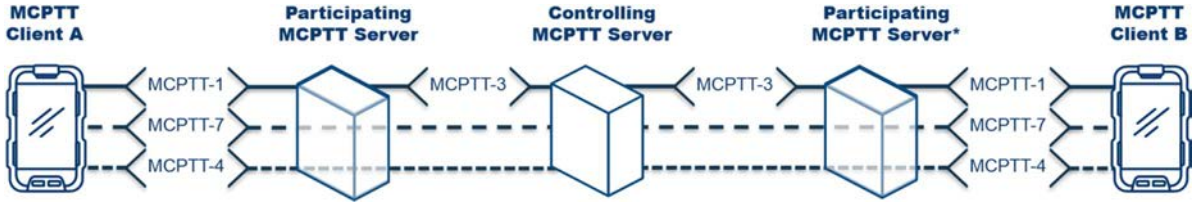

Figure 6: CFG_ONN_OTT-1 Interfaces for the unicast case

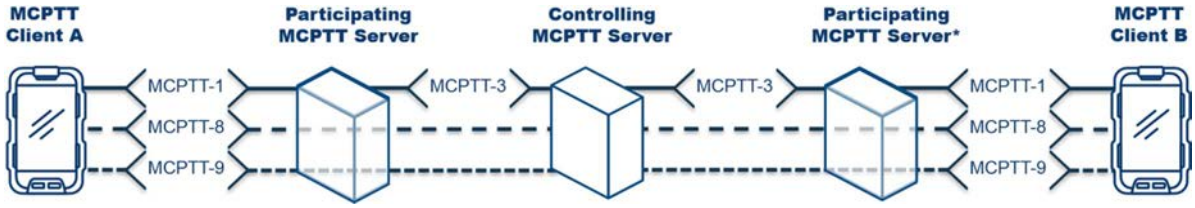

Figure 7: CFG_ONN_OTT-1 Interfaces for the multicast case

Finally, figure 7 defines the different Interfaces in the Application plane considered in the configuration CFG_ONN_OTT-1 for the multicast media handling and floor controlling case.

5.3 CFG_ONN_UNI-MC-LTE-1

In this configuration LTE has PCC capabilities and therefore shall enforce QoS policies in terms of prioritization and pre-emptiveness in unicast bearers including new Public Safety QCI 65/69 (but still no Release 13 eMBMS capabilities). Therefore, a Rx interface shall be exposed and related reference points and signalling mechanisms are tested.

As depicted in figure 8 and defined in clauses 5.2.9.3 and 9.2.2.3.2-3 of ETSI TS 123 179 [2] either the SIP Core or the MCPTT Server itself could signal the PCC mechanisms related to Unicast Bearer (MCPTT-5, Rx interface).

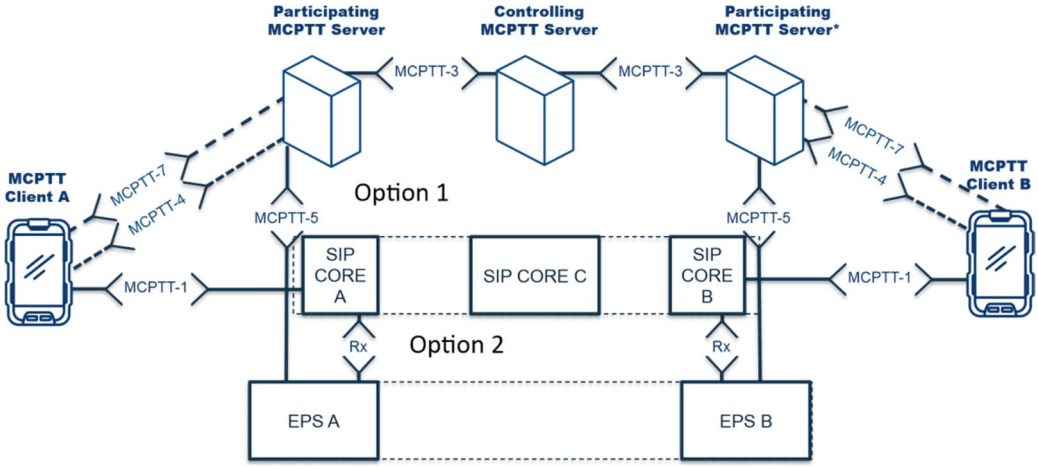

Figure 8: CFG_ONN_UNI-MC-LTE-1 Application plane interfaces

5.4 CFG_ONN_MULTI-MC-LTE-1

In this configuration LTE shall have full MCPTT supporting capabilities (i.e. Release 13 LTE-A Pro eMBMS + needed interfaces).

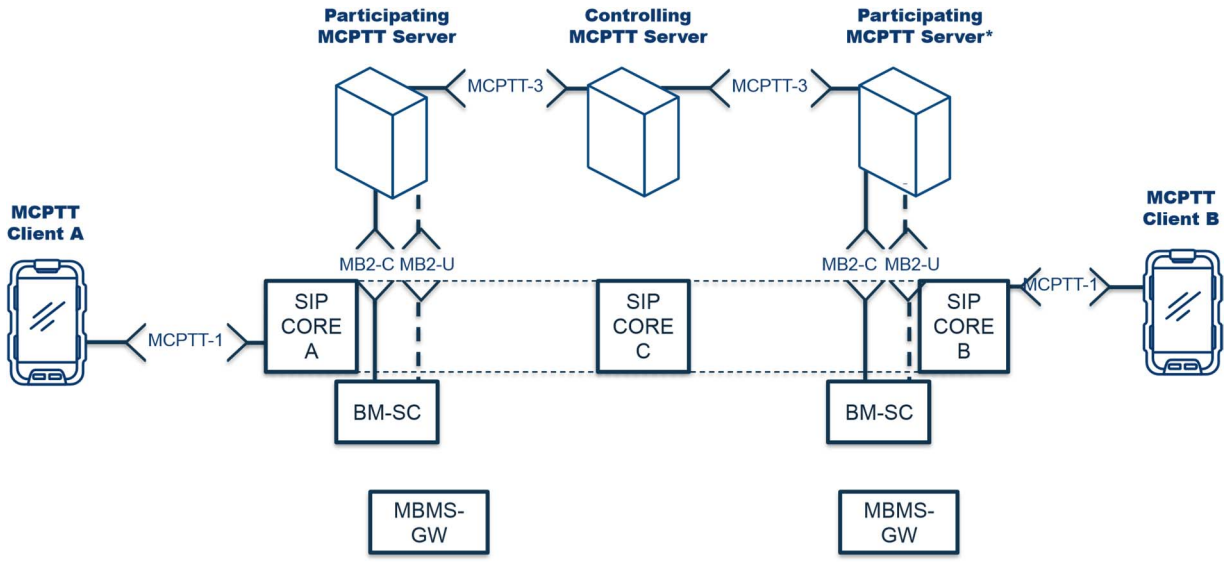

Figure 9: CFG_ONN_MULTI-MC-LTE-1 Application plane interfaces

6 Interoperable Functions Statement (IFS)

6.1 Entities

Table 1: Entities

Item	Which entity do you support?	Status	Support
1	UE		
2	MCPTT Client		
3	IMS		
4	MCPTT Participating AS		
5	MCPTT Controlling AS		
6	joint MCPTT Participating & Controlling AS		
7	BM-SC & MBMS-GW		
8	PCRF		
9	EPS		
10	CMS		
11	GMS		
12	KMS		
13	IDMS		

6.2 UE Features

Table 2: UE features

Item	Feature	ID	Ref	Status	Support
1	Does the UE support Mission Critical APNs and QCIs?	UE_MC-APN	ETSI TS 123 179 [2]		
2	Does the UE support EMBMS?	UE_EMBMS	ETSI TS 126 346 [10]		

6.3 MCPTT Client Features

Table 3: MCPTT Client features

Item	Feature	ID	Ref	Status	Support
1	Does MCPTT-Client support Authentication and ID retrieval from IDMS?	MCPTT-Client_IDMS	ETSI TS 124 482 [7]		
2	Does MCPTT-Client support PUBLISH Based Registration?	MCPTT-Client_PUBREG	ETSI TS 124 379 [4]		
3	Does MCPTT-Client support REGISTER Based Registration?	MCPTT-Client_REGREG	ETSI TS 124 379 [4]		
4	Does MCPTT-Client support On-Network MCPTT private and group calling?	MCPTT-Client_ONN-MCPTT-CALL	ETSI TS 124 379 [4]		
5	Does MCPTT-Client support On-Network MCPTT floor controlling?	MCPTT-Client_ONN-MCPTT-FC	ETSI TS 124 380 [5]		
6	Does MCPTT-Client support AMR-WB codec?	MCPTT-Client_AMR-WB	ETSI TS 126 179 [9]		
7	Does MCPTT-Client support EVS codec?	MCPTT-Client_EVS	ETSI TS 126 179 [9]		
8	Does MCPTT-Client support Configuration retrieval from CMS?	MCPTT-Client_CMS	ETSI TS 124 484 [8]		
9	Does MCPTT-Client support Key retrieval from KMS?	MCPTT-Client_KMS	ETSI TS 133 179 [14]		
10	Does MCPTT-Client support Mission Critical APNs and QCIs?	MCPTT-Client_MC-APN	ETSI TS 123 179 [2]		
11	Does MCPTT-Client support EMBMS?	MCPTT-Client_EMBMS	ETSI TS 126 346 [10]		
12	Does MCPTT-Client support Location configuration and submission?	MCPTT-Client_LOC	ETSI TS 124 379 [4]		

6.4 IMS Features

Table 4: IMS features

Item	Feature	ID	Ref	Status	Support
1	Does the IMS support 3rd Party REGISTER?	IMS_3RDPARTYREG	ETSI TS 124 379 [4]		
2	Does the IMS support MCPTT compatible Rx Interface in the PCSCF?	IMS_RX	ETSI TS 129 214 [12]		

6.5 MCPTT-Participating AS Features

Table 5: MCPTT-Participating AS features

Item	Feature	ID	Ref	Status	Support
1	Does the MCPTT-Part support REGISTER+PUBLISH Based Service Authorization?	MCPTT-Part_PUBAUTH	ETSI TS 124 379 [4]		
2	Does the MCPTT-Part support REGISTER Based Authorization?	MCPTT-Part_REGAUTH	ETSI TS 124 379 [4]		
3	Does the MCPTT-Part support On-Network MCPTT private and group calling?	MCPTT-Part_ONN-MCPTT-CALL	ETSI TS 124 379 [4]		
4	Does the MCPTT-Part support On-Network MCPTT floor controlling?	MCPTT-Part_ONN-MCPTT-FC	ETSI TS 124 380 [5]		
5	Does the MCPTT-Part support Location?	MCPTT-Part_LOC	ETSI TS 124 379 [4]		
6	Does the MCPTT-Part support Affiliation Procedures?	MCPTT-Part_AFFIL	ETSI TS 124 379 [4]		
7	Does the MCPTT-Part support MCPTT compatible MCPTT-5 (Rx) Interface?	MCPTT-Part_RX	ETSI TS 129 214 [12]		
8	Does the MCPTT-Part support MB2-C and MB2-U interfaces?	MCPTT-Part_GCSE	ETSI TS 129 468 [13]		

6.6 MCPTT-Controlling AS Features

Table 6: MCPTT-Controlling AS features

Item	Feature	ID	Ref	Status	Support
1	Does the MCPTT-Ctrl support On-Network MCPTT private and group calling?	MCPTT-Ctrl_ONN-MCPTT-CALL	ETSI TS 124 379 [4]		
2	Does the MCPTT-Ctrl support On-Network MCPTT floor controlling?	MCPTT-Ctrl_ONN-MCPTT-FC	ETSI TS 124 380 [5]		
3	Does the MCPTT-Ctrl support Location Configuration?	MCPTT-Ctrl_LOC	ETSI TS 124 379 [4]		
4	Does the MCPTT-Ctrl support Group composition retrieval from GMS?	MCPTT-Ctrl_GMS	ETSI TS 124 481 [6]		

6.7 BM-SC Features

Table 7: BM-SC features

Item	Feature	ID	Ref	Status	Support
1	Does the BM-SC support MB2-C and MB2-U interfaces?	BM-SC_GCSE	ETSI TS 129 468 [13]		

6.8 EPS Features

Table 8: EPS (LTE eUTRAN + EPC) features

Item	Feature	ID	Ref	Status	Support
1	Does the EPS support Mission Critical APNs and QCIs?	EPS_MC-APN	ETSI TS 123 179 [2]		
2	Does the EPS support MCPTT compatible Gx interface with the PCRF?	EPS_GX	ETSI TS 129 212 [11]		
3	Does the EPS support EMBMS capable EUTRAN+EPC?	EPS_EMBMS	ETSI TS 126 346 [10]		

6.9 PCRF Features

Table 9: PCRF features

Item	Feature	ID	Ref	Status	Support
1	Does the PCRF support MCPTT compatible RX interface?	PCRF_RX	ETSI TS 129 214 [12]		

7 Test Descriptions

7.1 Common Remarks

Initially the interactions with the support servers (i.e. particularly Group Management Server and Identity Management Server) may be analysed in separated tests and not necessarily in every e2e call procedure.

Similarly, unless otherwise specified, no security mechanism should be applied (including interaction with KMS and ciphering of different parts of both signalling and media streams), and all users shall be pre-configured at the different Functional Elements. Those users are considered as allowed to actually carry out the involved procedures.

During the tests every MCPTT Controlling server should take care of the group composition retrieval procedures in its own way.

Similarly MCPTT-specific MCPTT Client authentication, registration, and affiliation mechanisms may be considered as optional, so that the configuration allows MCPTT Participating and Controlling servers to consider agreed clients as registered, authenticated and also affiliated members of the groups considered in the tests.

Note that in all the sequence diagrams in the following clauses the flows between the MCPTT Functional Elements and the SIP/IMS Core are not shown unless explicitly specified. Therefore, some headers that should be included by SIP/IMS Core may not be mentioned in the sequence diagrams or messages (i.e. P-Asserted-Identity by P-CSCF).

In fact, both sequence diagrams and sample messages are provided for illustration purposes only. As a result, most of the headers (even MCPTT-ones) and some of the signalling messages have been removed. Normative references in clause 2.1 should be checked for details of all the procedures required.

7.2 Connectivity (CN)

7.2.1 MCPTT User initiates an on-demand prearranged MCPTT Group Call [CONN/ONN/GROUP/PREA/ONDEM/NFC/01]

This test comprises the establishment of an on-demand prearranged Group Call. Initially, pure SIP signalling shall be evaluated (then, no floor control -NFC- mechanisms shall be specifically considered apart from the simplest case for verifying e2e communications).

NOTE: In this test case and following diagrams it is not considered triggering and possible effects of (un)successful implicit affiliation in the MCPTT participating server for the case when the calling is not affiliated to the group identified in the "SIP INVITE request for originating participating MCPTT function" as determined by clause 9.2.2.2.11 in ETSI TS 124 379 [4].

Similarly, no emergency or imminent peril conditions shall be signalled.

Message Sequence Diagram

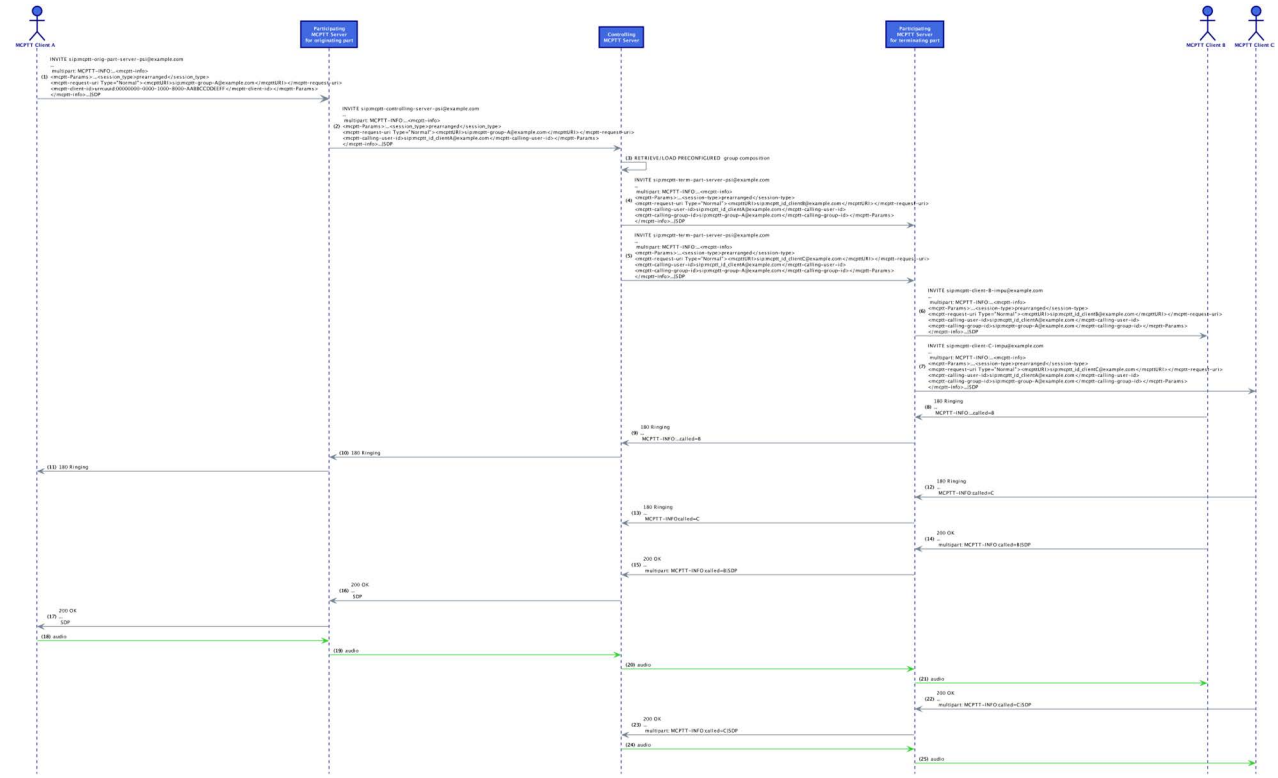

Figure 10: CONN/ONN/GROUP/PREA/ONDEM/NFC/01 Message Sequence

Message Details

```
[1] INVITE MCPTT Caller/UE --> MCPTT Participating
INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3
A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt"; require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-clientA@example.com>
Answer-Mode: Manual
Resource-Priority: mcpttp.5
Content-Type: multipart/mixed; boundary=[boundary]
--[boundary]
Content-Type: application/sdp
v=0
```

```
o=MCPTTCLIENT 1183811731 4248272445 IN IP4 IP
s=-
c=IN IP4 IP t=0 0
m=audio PORT RTP/AVP 105
a=label:1
i=speech
a=rtpmap:105 AMR-WB/16000/1
a=fmtp:105 mode-change-period=1; mode-change-capability=2; mode-change-neighbour=0; max-red=0
a=ptime:20
a=maxptime:240
m=application 1234 udp MCPTT
a=fmtp:MCPTT mc_queing;mc_priority=5;mc_granted;mc_implicit_request ...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml
<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="
        http://www.w3.org/2001/XMLSchema-instance">
    <mcptt-Params>
        <session-type>prearranged</session-type>
        <mcptt-request-uri type="Normal">
            <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
        </mcptt-request-uri>
        <mcptt-client-id type="Normal">
                    <mcpttURI>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttURI>
        </mcptt-client-id>
    </mcptt-Params>
</mcpttinfo>

--[boundary]
[2] INVITE MCPTT Participating --> MCPTT Controlling
INVITE sip:mcptt-controlling-server-psi@example.com SIP/2.0
To: <sip:mcptt-controlling-server-psi@example.com> ...
--[boundary]
Content-Type: application/sdp ...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml
<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi=" http://www.w3.org/2001/XMLSchema-instance">
    <mcptt-Params>
        <session-type>prearranged</session-type>
        <mcptt-request-uri type="Normal">
            <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
        </mcptt-request-uri>
        <mcptt-calling-user-id type="Normal">
        <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI> </mcptt-calling-user-id>
    </mcptt-Params>
</mcpttinfo>
--[boundary] ...
...
...
```

Interoperability Test Description

Table 10: CONN/ONN/GROUP/PREA/ONDEM/NFC/01

Interoperability Test Description			
Identifier	CONN/ONN/GROUP/PREA/ONDEM/NFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing and SIP signalling of a pre-arranged on demand Group Call		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL (see note), MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (see note) (clause 6.6)		
Pre-test conditions	• IP connectivity - among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers UEs properly registered to the SIP core/IMS and MCPTT system • Calling user is affiliated to the called group		
Test Sequence	Step	Type	Description
	1	stimulus	User 1 (mcptt_id_clientA@example.com) calls mcptt-group-A
	2	check	Dialog creating INVITE received at the MCPTT participating server of mcptt_id_clientA@example.com after traversing SIP core/IMS
	3	check	INVITE received at the MCPTT controlling server
	4	check	The MCPTT controlling server loads the affiliated members of the mcptt-group-A (either preconfigured or retrieved from the GMS) and creates an INVITE per each of the "n" members
	5	check	"n" INVITEs received at the MCPTT participating servers of each mcptt_id_clientX (where X:1..n)
	6	check	"n" INVITEs received at the affiliated mcptt_id_clientX
	7	check	"n" SIP dialogs established
	8	verify	Call connected and multiple media flows exchanged
NOTE: It is not considered the triggering and possible effects of (un)successful implicit affiliation in the MCPTT participating server for the case when the calling is not affiliated to the group identified in the "SIP INVITE request for originating participating MCPTT function" as determined by clause 9.2.2.2.11 in ETSI TS 124 379 [4].			

7.2.2 MCPTT User initiates an on-demand prearranged MCPTT Group Call: Emergency Group Call [CONN/ONN/GROUP/PREA/ONDEM/NFC/02]

The test is equivalent to CONN/ONN/GROUP/PREA/ONDEM/NFC/01 (clause 7.2.1) but the calling user indicates that this is an Emergency Group Call.

Clauses 6.2.8.1.1 to 6.2.8.1.8 and 6.2.8.1.13 to 6.2.8.1.17 in ETSI TS 124 379 [4] describe the mechanisms involved in an Emergency Group Call handling including additional headers and elements (i.e. <mcptt-Params> in the <mcptt-info> element in the application/vnd.3gpp.mcptt-info+xml MIME body).

Furthermore, Emergency Group Call requests and answers trigger changes to the emergency call state (i.e. from MEGC 2: emergency-call-requested to MEGC 3: emergency-call-granted) and the emergency alert state (i.e. MEA 3: emergency-alert-initiated), internal states of the MCPTT client (and also groups) that are not shown in the diagrams and messages below.

Message Sequence Diagram

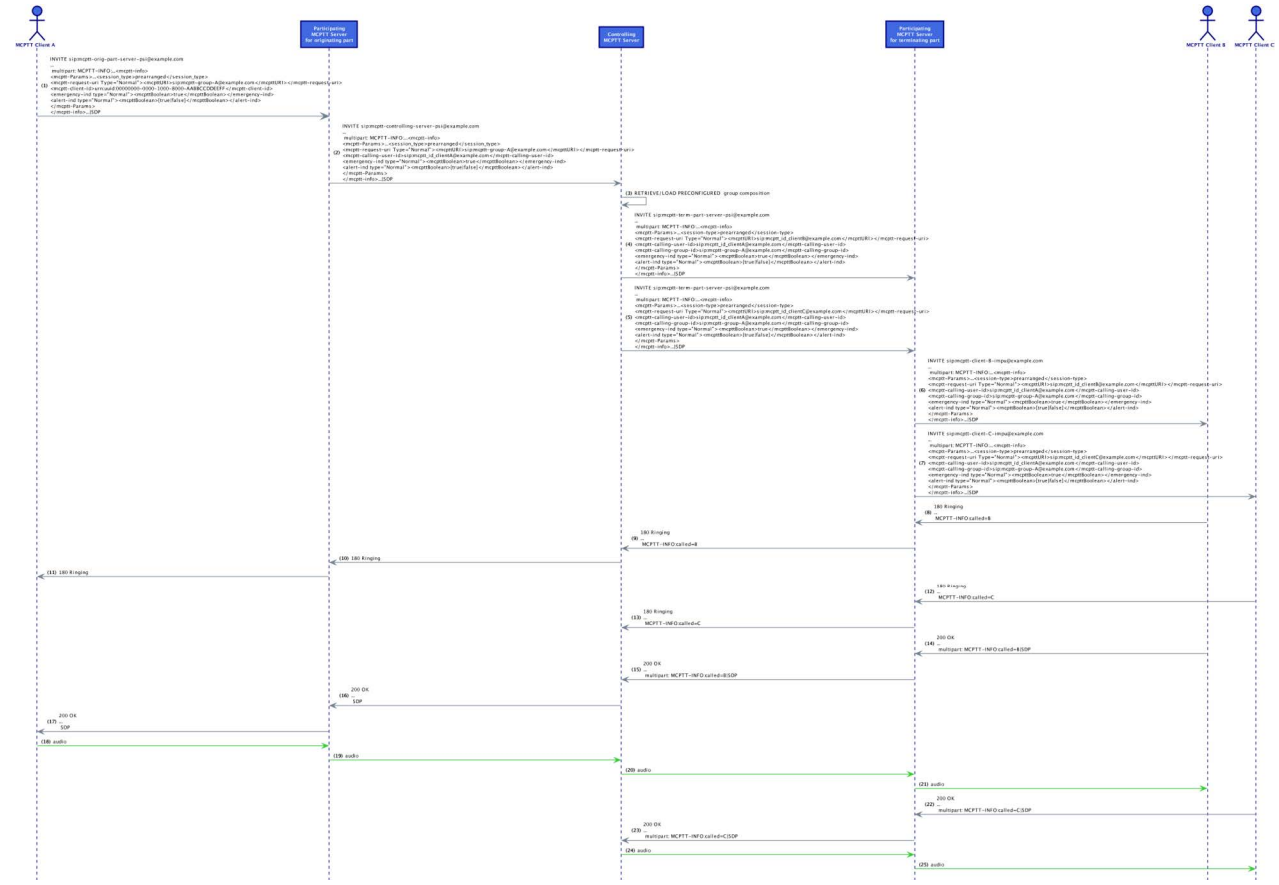

Figure 11: CONN/ONN/GROUP/PREA/ONDEM/NFC/02 Message Sequence

Message Details

```
[1] INVITE MCPTT Caller/UE --> MCPTT Participating

INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-clientA@example.com>
Answer-Mode: Manual
Resource-Priority: mcpttp.5
Content-Type: multipart/mixed; boundary=[boundary]

--[boundary]
Content-Type: application/sdp

v=0
o=MCPTTCLIENT 1183811731 4248272445 IN IP4 IP
s=-
c=IN IP4 IP
t=0 0
m=audio PORT RTP/AVP 105
a=label:1
i=speech
a=rtpmap:105 AMR-WB/16000/1
a=fmtp:105 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
a=ptime:20
a=maxptime:240
m=application 1234 udp MCPTT
a=fmtp:MCPTT mc_queing;mc_priority=5;mc_granted;mc_implicit_request
...
```

```
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-client-id type="Normal">
      <mcpttURI>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttURI>
    </mcptt-client-id>
    <emergency-ind type="Normal">
      <mcpttBoolean>true</mcpttBoolean>
    </emergency-ind>
    <alert-ind type="Normal">
      <mcpttBoolean>[true|false]</mcpttBoolean>
    </alert-ind>
  </mcptt-Params>
</mcpttinfo>
--[boundary]


[2] INVITE MCPTT Participating --> MCPTT Controlling

INVITE sip:mcptt-controlling-server-psi@example.com SIP/2.0
To: <sip:mcptt-controlling-server-psi@example.com>
...

--[boundary]
Content-Type: application/sdp
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
    <emergency-ind type="Normal">
      <mcpttBoolean>true</mcpttBoolean>
    </emergency-ind>
    <alert-ind type="Normal">
      <mcpttBoolean>[true|false]</mcpttBoolean>
    </alert-ind>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
...
...
...
```

Interoperability Test Description

Table 11: CONN/ONN/GROUP/PREA/ONDEM/NFC/02

Interoperability Test Description			
Identifier	CONN/ONN/GROUP/PREA/ONDEM/NFC/02		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a pre-arranged on demand emergency Group Call		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL (see note), MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (see note) (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system • Calling user is affiliated to the called group		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) initiates an emergency Group Call to mcptt-group-A by setting the proper elements in the mcptt-info MIME body
	2	check	Dialog creating INVITE received at the MCPTT participating server of mcptt_id_clientA@example.com after traversing SIP core/IMS
	3	check	INVITE received at the MCPTT controlling server
	4	check	The MCPTT controlling server loads the affiliated members of the mcptt-group-A (either preconfigured or retrieved from the GMS) and creates an INVITE per each of the "n" members
	5	check	"n" INVITEs received at the MCPTT participating servers of each mcptt_id_clientX (where X:1..n)
	6	check	"n" INVITEs received at mcptt_id_clientX
	7	check	"n" SIP dialogs established
	8	verify	Call connected and multiple media flows exchanged
NOTE: It is not considered the triggering and possible effects of (un)successful implicit affiliation in the MCPTT participating server for the case when the calling is not affiliated to the group identified in the "SIP INVITE request for originating participating MCPTT function" as determined by clause 9.2.2.2.11 in ETSI TS 124 379 [4].			

7.2.3 MCPTT User initiates an on-demand prearranged MCPTT Group Call: Imminent Peril Group Call [CONN/ONN/GROUP/PREA/ONDEM/NFC/03]

The test is equivalent to CONN/ONN/GROUP/PREA/ONDEM/NFC/01 (clause 7.2.1) but the calling user indicates that this is an Imminent Peril Group Call.

Clauses 6.2.8.1.9 to 6.2.8.1.12 in ETSI TS 124 379 [4] indicate the mechanisms involved in an Imminent Peril Group Call. Initially, the MCPTT Client sets the <imminentperil-ind> element in the MIME mcptt-info body (within the mcptt-Params element) to "true". Furthermore, Imminent Peril Group Call requests and answers trigger changes to the imminent Peril Group Call state (i.e. from MIGC 2: imminent-peril-callrequested to MIGC 3:imminent-peril-call-granted).

Message Sequence Diagram

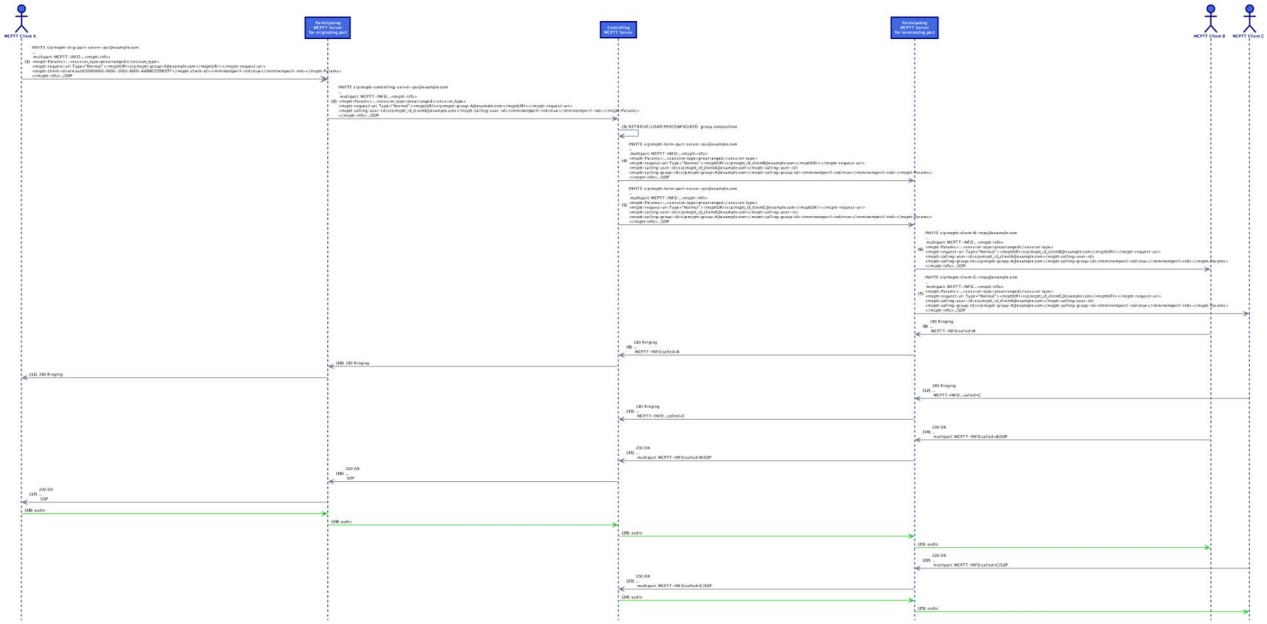

Figure 12: CONN/ONN/GROUP/PREA/ONDEM/NFC/03 Message Sequence

Message Details

```
[1] INVITE MCPTT Caller/UE --> MCPTT Participating

INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-clientA@example.com>
Answer-Mode: Manual
Resource-Priority: mcpttp.5
Content-Type: multipart/mixed; boundary=[boundary]

--[boundary]
Content-Type: application/sdp

v=0
o=MCPTTCLIENT 1183811731 4248272445 IN IP4 IP
s=-
c=IN IP4 IP
t=0 0
m=audio PORT RTP/AVP 105
a=label:1
i=speech
a=rtpmap:105 AMR-WB/16000/1
a=fmtp:105 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
a=ptime:20
a=maxptime:240
m=application 1234 udp MCPTT
a=fmtp:MCPTT mc_queing;mc_priority=5;mc_granted;mc_implicit_request
...

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-client-id type="Normal">
      <mcpttURI>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttURI>
```

```
    </mcptt-client-id>
    <imminentperil-ind>true</imminentperil-ind>
  </mcptt-Params>
</mcpttinfo>
--[boundary]


[2] INVITE MCPTT Participating --> MCPTT Controlling

INVITE sip:mcptt-controlling-server-psi@example.com SIP/2.0
To: <sip:mcptt-controlling-server-psi@example.com>
...

--[boundary]
Content-Type: application/sdp
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
    <imminentperil-ind>true</imminentperil-ind>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
...
...
...
```

Interoperability Test Description

Table 12: CONN/ONN/GROUP/PREA/ONDEM/NFC/03

Interoperability Test Description			
Identifier	CONN/ONN/GROUP/PREA/ONDEM/NFC/03		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of an Imminent Peril pre-arranged on demand Group Call		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system • Calling user is affiliated to the called group		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) initiates an Imminent Peril Group Call to mcptt-group-A by setting the proper elements in the mcptt-info MIME body
	2	check	Dialog creating INVITE received at the MCPTT participating server of mcptt_id_clientA@example.com after traversing SIP core/IMS
	3	check	INVITE received at the MCPTT controlling server
	4	check	The MCPTT controlling server loads the affiliated members of the mcptt-group-A (either preconfigured or retrieved from the GMS) and creates an INVITE per each of the "n" members
	5	check	"n" INVITEs received at the MCPTT participating servers of each mcptt_id_clientX (where X:1..n)
	6	check	"n" INVITEs received at mcptt_id_clientX
	7	check	"n" SIP dialogs established
	8	verify	Call connected and multiple media flows exchanged

7.2.4 MCPTT User initiates an on-demand prearranged MCPTT Group Call: Broadcast Group Call [CONN/ONN/GROUP/PREA/ONDEM/NFC/04]

The test is equivalent to CONN/ONN/GROUP/PREA/ONDEM/NFC/01 (clause 7.2.1) but the calling user indicates that this is Broadcast Group Call.

Clause 6.2.8.2 in ETSI TS 124 379 [4] indicates the mechanisms involved in a Broadcast Group Call. Initially, the MCPTT Client sets the <broadcast-ind> element in the MIME mcptt-info body (within the mcpttParams element in the mcpttinfo XML) set to "true". The handling of the call is basically the same as other Group Call but only the call originating MCPTT user is allowed to transmit media and if the media transmission from call originating MCPTT user is complete, the broadcast Group Call is released (see clause 10.6.2.5 in ETSI TS 123 179 [2] for more details).

Message Sequence Diagram

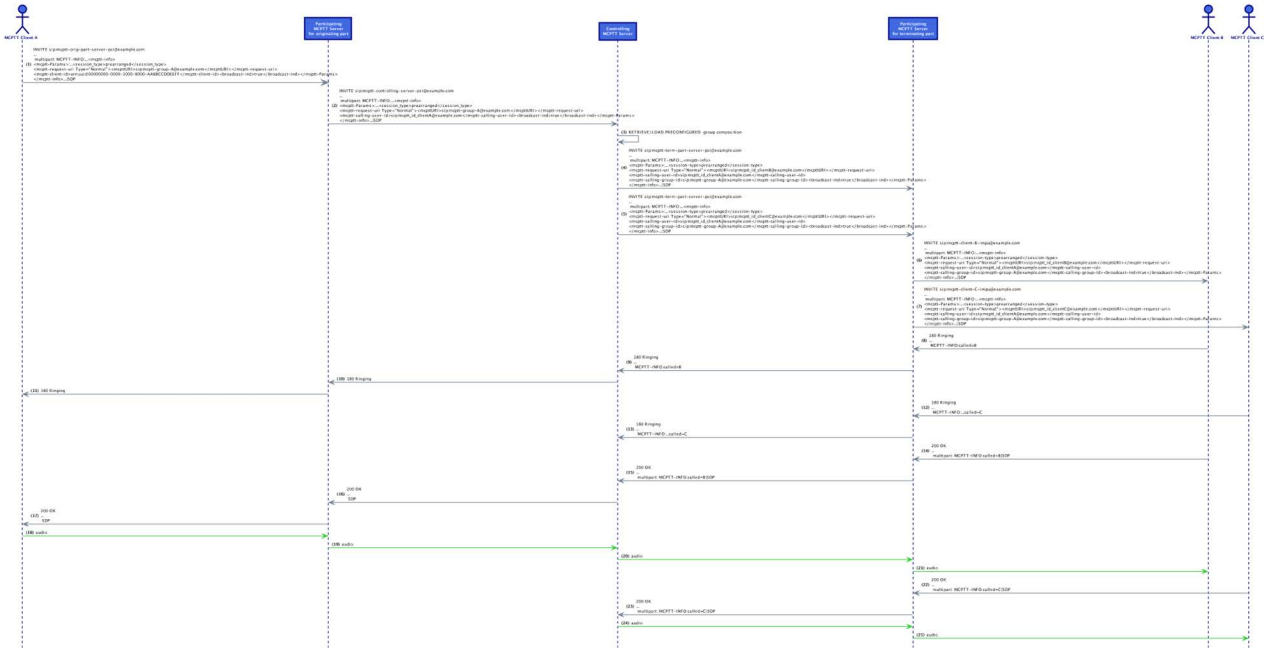

Figure 13: CONN/ONN/GROUP/PREA/ONDEM/NFC/04 Message Sequence

Message Details

```
[1] INVITE MCPTT Caller/UE --> MCPTT Participating

INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-clientA@example.com>
Answer-Mode: Manual
Resource-Priority: mcpttp.5
Content-Type: multipart/mixed; boundary=[boundary]

--[boundary]
Content-Type: application/sdp

v=0
o=MCPTTCLIENT 1183811731 4248272445 IN IP4 IP
s=-
c=IN IP4 IP
t=0 0
m=audio PORT RTP/AVP 105
a=label:1
i=speech
a=rtpmap:105 AMR-WB/16000/1
a=fmtp:105 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
a=ptime:20
a=maxptime:240
m=application 1234 udp MCPTT
a=fmtp:MCPTT mc_queing;mc_priority=5;mc_granted;mc_implicit_request
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-client-id type="Normal">
      <mcpttURI>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttURI>
```

```
    </mcptt-client-id>
    <broadcast-ind>true</broadcast-ind>
  </mcptt-Params>
</mcpttinfo>
--[boundary]


[2] INVITE MCPTT Participating --> MCPTT Controlling

INVITE sip:mcptt-controlling-server-psi@example.com SIP/2.0
To: <sip:mcptt-controlling-server-psi@example.com>
...

--[boundary]
Content-Type: application/sdp
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
    <broadcast-ind>true</broadcast-ind>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
...
...
...
```

Interoperability Test Description

Table 13: CONN/ONN/GROUP/PREA/ONDEM/NFC/04

Interoperability Test Description			
Identifier	CONN/ONN/GROUP/PREA/ONDEM/NFC/04		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a pre-arranged on demand Broadcast Group Call		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system • Calling user is affiliated to the called group		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) initiates a broadcast Group Call to mcptt-group-A by setting the proper elements in the mcptt-info MIME body
	2	check	Dialog creating INVITE received at the MCPTT participating server of mcptt_id_clientA@example.com after traversing SIP core/IMS
	3	check	INVITE received at the MCPTT controlling server
	4	check	The MCPTT controlling server loads the affiliated members of the mcptt-group-A (either preconfigured or retrieved from the GMS) and creates an INVITE per each of the "n" members
	5	check	"n" INVITEs received at the MCPTT participating servers of each mcptt_id_clientX (where X:1..n)
	6	check	"n" INVITEs received at mcptt_id_clientX
	7	check	"n" SIP dialogs established
	8	verify	Call connected and multiple media flows exchanged

7.2.5 MCPTT User initiates an on-demand prearranged MCPTT Group Call: Upgrade to in progress emergency or imminent peril [CONN/ONN/GROUP/PREA/ONDEM/NFC/05]

This test covers the upgrade to either emergency or imminent peril Group Call during an in-progress Group Call as defined in CONN/ONN/GROUP/PREA/ONDEM/NFC/01 (clause 7.2.1).

There, the initial steps are totally equivalent but, upon a new risk or incident the MCPTT User triggers the emergency or imminent peril upgrade mechanism according to clauses 10.1.1.2.1.3 and 10.1.2.2.1.4 in ETSI TS 124 379 [4]). In both cases, a re-INVITE is triggered with the new <emergency-ind> or <imminentperil-ind> elements (see clauses 7.2.2 and 7.2.3 respectively for more info).

Message Sequence Diagram

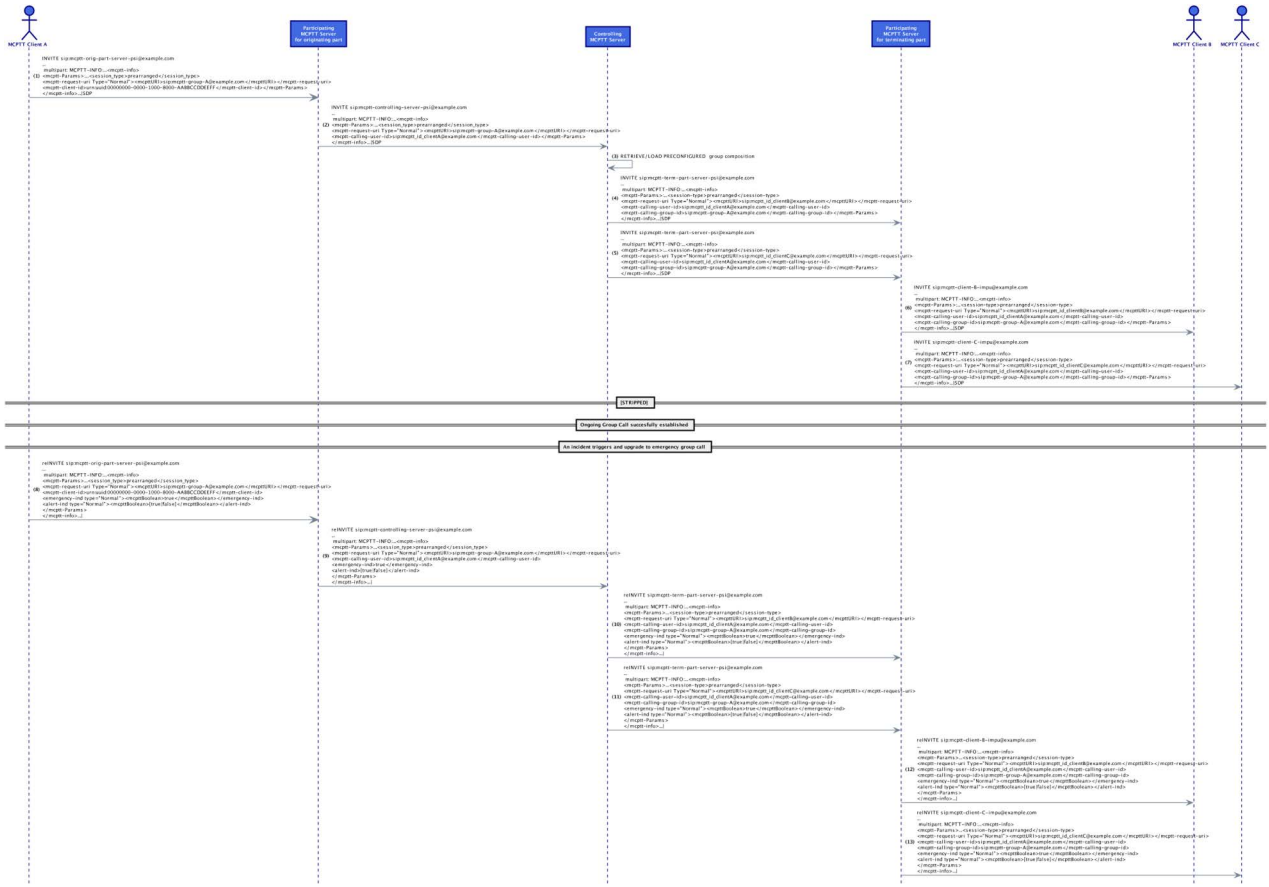

Figure 14: CONN/ONN/GROUP/PREA/ONDEM/NFC/05 Message Sequence

Message Details

```
[8] re-INVITE MCPTT Caller/UE --> MCPTT Participating

[re]INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-clientA@example.com>
Answer-Mode: Manual
Resource-Priority: mcpttp.5
Content-Type: multipart/mixed; boundary=[boundary]

--[boundary]
Content-Type: application/sdp

v=0
o=MCPTTCLIENT 1183811731 4248272445 IN IP4 IP
s=-
c=IN IP4 IP
t=0 0
m=audio PORT RTP/AVP 105
a=label:1
i=speech
a=rtpmap:105 AMR-WB/16000/1
a=fmtp:105 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
a=ptime:20
a=maxptime:240
m=application 1234 udp MCPTT
a=fmtp:MCPTT mc_queing;mc_priority=5;mc_granted;mc_implicit_request
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml
```

```
<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-client-id type="Normal">
      <mcpttURI>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttURI>
    </mcptt-client-id>
    <emergency-ind type="Normal">
      <mcpttBoolean>true</mcpttBoolean>
    </emergency-ind>
    <alert-ind type="Normal">
      <mcpttBoolean>[true|false]</mcpttBoolean>
    </alert-ind>
  </mcptt-Params>
</mcpttinfo>
--[boundary]


[9] re-INVITE MCPTT Participating --> MCPTT Controlling

[re]INVITE sip:mcptt-controlling-server-psi@example.com SIP/2.0
To: <sip:mcptt-controlling-server-psi@example.com>
...

--[boundary]
Content-Type: application/sdp
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
    <emergency-ind type="Normal">
      <mcpttBoolean>true</mcpttBoolean>
    </emergency-ind>
    <alert-ind type="Normal">
      <mcpttBoolean>[true|false]</mcpttBoolean>
    </alert-ind>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
...
...
...
```

Interoperability Test Description

Table 14: CONN/ONN/GROUP/PREA/ONDEM/NFC/05

Interoperability Test Description			
Identifier	CONN/ONN/GROUP/PREA/ONDEM/NFC/05		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling for a Group Call that is upgraded to Imminent Peril or Emergency		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system • Calling user is affiliated to the called group • Group Call properly established		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) initiates a regular Group Call to mcptt-group-A
	2	check	The initial Group Call is properly established
	3	stimulus	Calling user upgrades the call to an Imminent Peril/Emergency one with a new INVITE with the proper elements in the mcptt-info
	4	check	reINVITE received at the MCPTT participating server of mcptt_id_clientA@example.com after traversing SIP core/IMS
	5	check	reINVITE received at the MCPTT controlling server
	6	check	"n" reINVITEs received at mcptt_id_clientX
	7	verify	New status of the Group Call agreed

7.2.6 MCPTT User initiates the termination of an on-demand prearranged MCPTT Group Call [CONN/ONN/GROUP/PREA/ONDEM/NFC/06]

This test covers the termination by the Calling User of an in-progress prearranged MCPTT Group Call (clauses 10.1.1.2.3.1 and 10.1.1.3.3.1 in ETSI TS 124 379 [4]). It therefore comprises checking the correct termination of the Group Call by the classical BYE procedure in clause 6.2.4.1 in ETSI TS 124 379 [4].

In every BYE the MCPTT Session Identity to leave shall be set as Request-URI.

Message Sequence Diagram

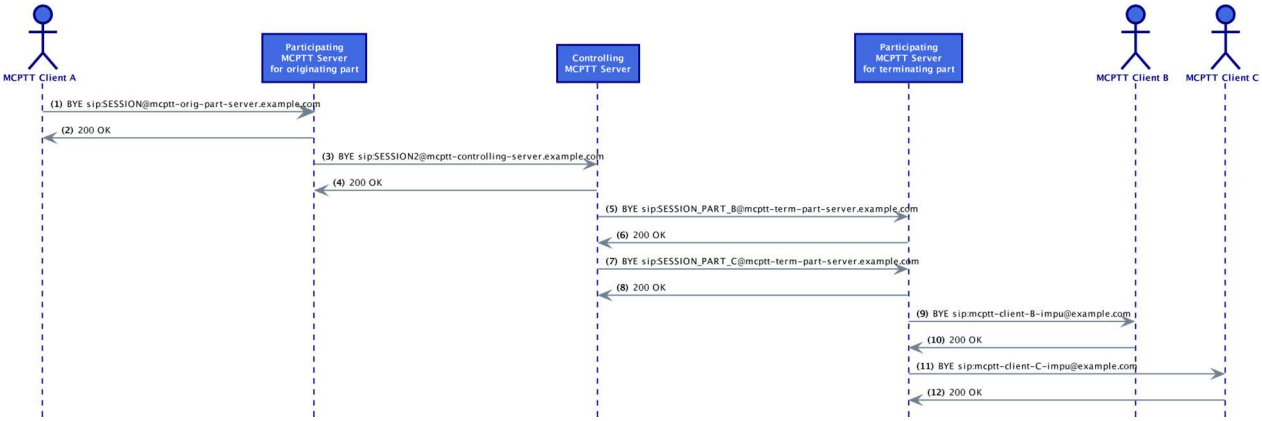

Figure 15: CONN/ONN/GROUP/PREA/ONDEM/NFC/06 Message Sequence

Message Details

```
[1] BYE Caller/UE --> MCPTT Participating

BYE sip:SESSION@mcptt-server-orig-part.example.com SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-clientA@example.com>
CSeq: 2 BYE
Call-ID: XXXX@YYYYYYY


[2] 200 OK MCPTT Participating --> Caller/UE

BYE 200 OK SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>;tag=XXXX
CSeq: 2 BYE
Call-ID: XXXX@YYYYYYY
```

Interoperability Test Description

Table 15: CONN/ONN/GROUP/PREA/ONDEM/NFC/06

Interoperability Test Description			
Identifier	CONN/ONN/GROUP/PREA/ONDEM/NFC/06		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling needed to terminate an ongoing Chat Group Call.		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system • Calling user is affiliated to the called group • Ongoing Group Call		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) initiates an emergency Group Call to mcptt-group-A
	2	check	The initial Group Call is properly stablished
	3	stimulus	Calling user triggers the termination of the call by sending a BYE message
	4	verify	Group call properly terminated
NOTE: In every BYE the MCPTT Session Identity to leave shall be set as Request-URI.			

7.2.7 MCPTT User initiates a prearranged MCPTT Group Call using pre-established session [CONN/ONN/GROUP/PREA/PRE/NFC/01]

This test is equivalent to the on-demand case (see clause 7.2.1) but using pre-established sessions.
Therefore, after a successful pre-establishment procedure by all users, the originating client initiates a prearranged Group Call by generating a REFER request as specified in IETF RFC 3515 [15] and updated by IETF RFC 6665 [19] and IETF RFC 7647 [20].

For simplicity purposes it is assumed that all the clients involved in the Group Call have already carried out the pre-establishment procedure. Hybrid situations could be also considered (i.e. mixing pre-established and on-demand terminating clients of the group) but the diagram illustrates the pre-established case only. For the pre-established sessions each participating function shall use floor control based signalling (MCPC) to notify the new session to originating and terminating Clients.

Message Sequence Diagram

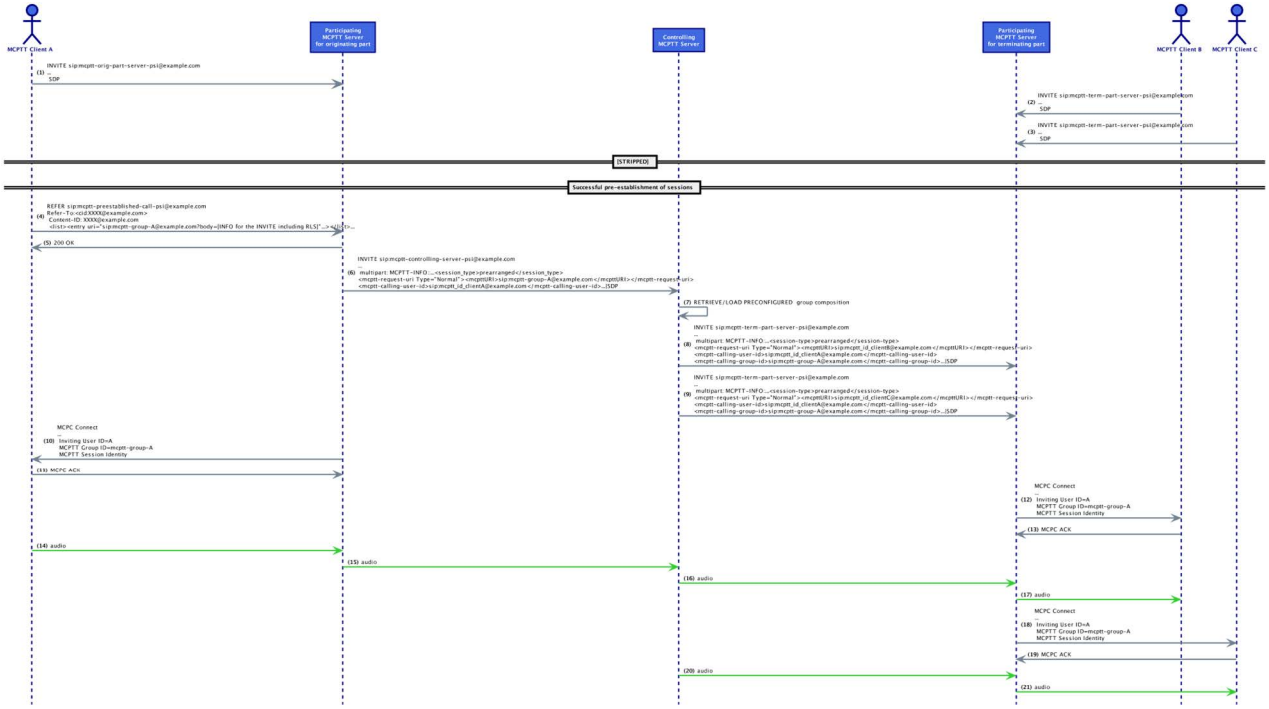

Figure 16: CONN/ONN/GROUP/PREA/PRE/NFC/01 Message Sequence

Message Details

```
[4] REFER MCPTT Caller/UE --> MCPTT Participating

REFER sip:mcptt-preestablished-session-psi@example.com SIP/2.0
From: <sip:mcptt-client-A@example.com>;tag=ABCD
To: <sip:mcptt-preestablished-session-psi@example.com>
Contact: <sip:mcptt-client-A@IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-
service.ims.icsi.mcptt";+g.3gpp.mcptt
CSeq: 2 REFER
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-client-A@example.com>
Supported: norefersub
Refer-Sub: false
Require: multiple-refer
Target-Dialog: 1-26282@IP;local-tag=1;remote-tag=y1DK7rrj2ag0m
Content-Type: application/resource-lists+xml
Resource-Priority: mcpttp.5
Refer-To: <cid:g8QyvQSQ0rBgy7tg8gt45@example.com>
Content-ID: g8QyvQSQ0rBgy7tg8gt45@example.com

          <?xml version="1.0" encoding="UTF-8" ?>
            <resource-lists
                xmlns="urn:ietf:params:xml:ns:resource-lists"
                xmlns:cc="urn:ietf:params:xml:ns:copycontrol">
                <list>
                    <entry
                        uri="sip:mcptt_id_clientB@example.com?body=--YKP42ALY6Zy3ey%0AContent-
Type%3A%20application%2Fvnd.3gpp.mcptt-
info%2Bxml%0A%0A%3C%3Fxml%20version%3D%221.0%22%20encoding%3D%22UTF-
8%22%3F%3E%0A%3Cmcpttinfo%20xmlns%3D%22urn%3A3gpp%3Ans%3AmcpttInfo%3A1.0%22%20xmlns%3Axsi%3D%22http%
3A%2F%2Fwww.w3.org%2F2001%2FXMLSchema-instance%22%3E%20%0A%20%20%3Cmcptt-
Params%3E%20%0A%20%20%20%20%3Csession-type%3Eprearranged%3C%2Fsession-
type%3E%0A%20%20%20%20.....Content-Type%3A%20application%2Fsdp%0A%0Av%3D0%0Ao%3i....-YKP42ALY6Zy3ey-
-&amp;Answer-Mode=Auto&amp;Content-Type=multipart%2Fmixed%3Bboundary%3DYKP42ALY6Zy3ey"
                        cc:copyControl="to"/>
                </list>
            </resource-lists>
```

```
[9] MCPC MCPTT Participating --> MCPTT Callee/UE

Real-time Transport Control Protocol (Application specific)
    Mission Critical Push-to-talk: Pre-established session call control
        MCPTT Session Identity: sip:SESSION_ID_PART_B@mcptt-server-orig-part.example.com:11060
        Media Stream: 1
        Control Channel: 2
        Answer State: Unconfirmed (0)
        Inviting MCPTT User Identity: sip:mcptt_id_clientA@example.com
```

Interoperability Test Description

Table 16: CONN/ONN/GROUP/PREA/PRE/NFC/01

Interoperability Test Description			
Identifier	CONN/ONN/GROUP/PREA/PRE/NFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling for a prearranged Group Call using pre-established session		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Calling user is affiliated to the called group • Pre-established sessions and prearranged Group Call already established		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	Calling user terminates the ongoing call by sending a REFER
	2	check	REFER received at the MCPTT participating server of mcptt_id_clientA@example.com after traversing SIP core/IMS
	3	check	BYE received at the MCPTT controlling server
	4	check	"n" INVITEs received at the respective MCPTT participating servers
	5	check	"n" MCPC procedures to signal the new call to every mcptt_id_clientX
	6	verify	Group call established

7.2.8 MCPTT User initiates the termination of a prearranged MCPTT Group Call using pre-established session [CONN/ONN/GROUP/PREA/PRE/NFC/02]

This test is equivalent to the on-demand case (see clause 7.2.6) but using pre-established sessions.

Therefore, the Calling User of an on-going Group Call using a pre-established session sends an out-of-dialog REFER as described in clause 6.2.4.2 in ETSI TS 124 379 [4] including the "method" SIP URI parameter with the value "BYE" in the URI in the Refer-To header field.

After that initial REFER the Group Call terminating procedure follows the same mechanisms as in clause 7.2.6 till the terminating participating server. As defined in clause 6.3.2.2.8.2 in ETSI TS 124 379 [4] the participating MCPTT function shall then interact with the media plane resources towards the MCPTT client as specified in ETSI TS 124 380 [5] and maintain the pre-established session towards the MCPTT client.

Message Sequence Diagram

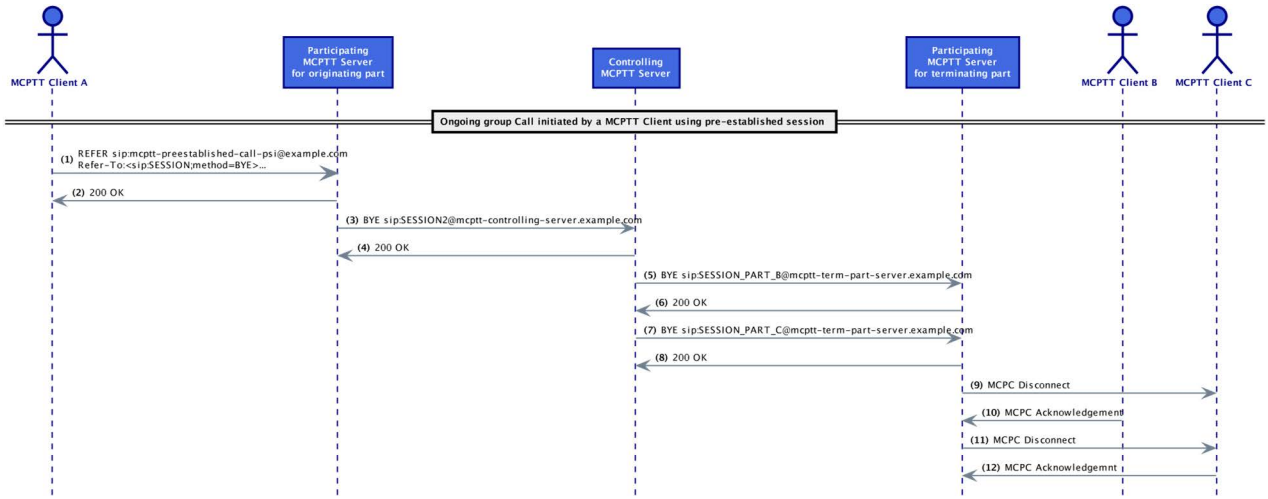

Figure 17: CONN/ONN/GROUP/PREA/PRE/NFC/02 Message Sequence

Message Details

```
[1] REFER MCPTT Caller/UE --> MCPTT Participating

REFER sip:mcptt-preestablished-session@example.com SIP/2.0
From: <sip:mcptt-client-B@example.com>;tag=EFGH
To: <sip:mcptt-preestablished-session@example.com>
Refer-To: <sip:SESSION;method=BYE>
Target-Dialog: sip:CID@example.com


[3] BYE MCPTT Participating --> MCPTT Controlling

BYE sip:SESSION_2@mcptt-server-controlling.example.com SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-clientA@example.com>
```

Interoperability Test Description

Table 17: CONN/ONN/GROUP/PREA/PRE/NFC/02

Interoperability Test Description			
Identifier	CONN/ONN/GROUP/PREA/PRE/NFC/02		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling in order to terminate an ongoing prearranged Group Call using pre-established sessions.		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMSCalling user is affiliated to the called group • Ongoing pre-arranged Group Call with all members using pre-established sessions		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	Users initiates the termination of the ongoing prearranged Group Call
	2	check	Out-of-dialog REFER received at the MCPTT participating server of mcptt_id_clientA@example.com after traversing SIP core/IMS
	3	check	BYE received at the MCPTT controlling server
	4	check	"n" BYEs with the proper Session Identities sent to all the respective MCPTT participating servers
	5	check	"n" MCPC Disconnect sent to all the users
	6	verify	Group call terminated

7.2.9 MCPTT User initiates an on-demand Chat Group Call [CONN/GROUP/CHAT/ONDEM/NFC/01]

This test comprises an on-demand chat Group Call. As in clause 7.2.1 pure SIP signalling will be evaluated (then, no floor control -NFC- mechanisms will be specifically considered apart from the simplest case for verifying e2e communications).

Similarly, in this test case and following diagrams the triggering and possible effects of (un)successful implicit affiliation (in the MCPTT participating server for the case when the calling is not affiliated to the group identified in the "SIP INVITE request for originating participating MCPTT function") is not considered.

Furthermore, for simplicity purposes no emergency/imminent peril condition shall be signalled either by the initial INVITE or the subsequent ones (one per user joining). Therefore most of the associated clauses indicated in the clauses 10.1.2.2.1.1, 10.1.2.3.1.1, 10.1.2.3.1.3 and 10.1.2.4.1.1 in ETSI TS 124 379 [4] shall not take effect. The status of the ongoing chat Group Call shall therefore be always no emergency/imminent peril status. As a result, the MCPTT controlling shall NOT send INVITE requests to the affiliated but not joined members of the chat MCPTT group neither re-INVITE to the affiliated and joined ones.

The effect of (un)successful implicit affiliation, limitation on maximum number of users or ongoing sessions is not considered.

Message Sequence Diagram

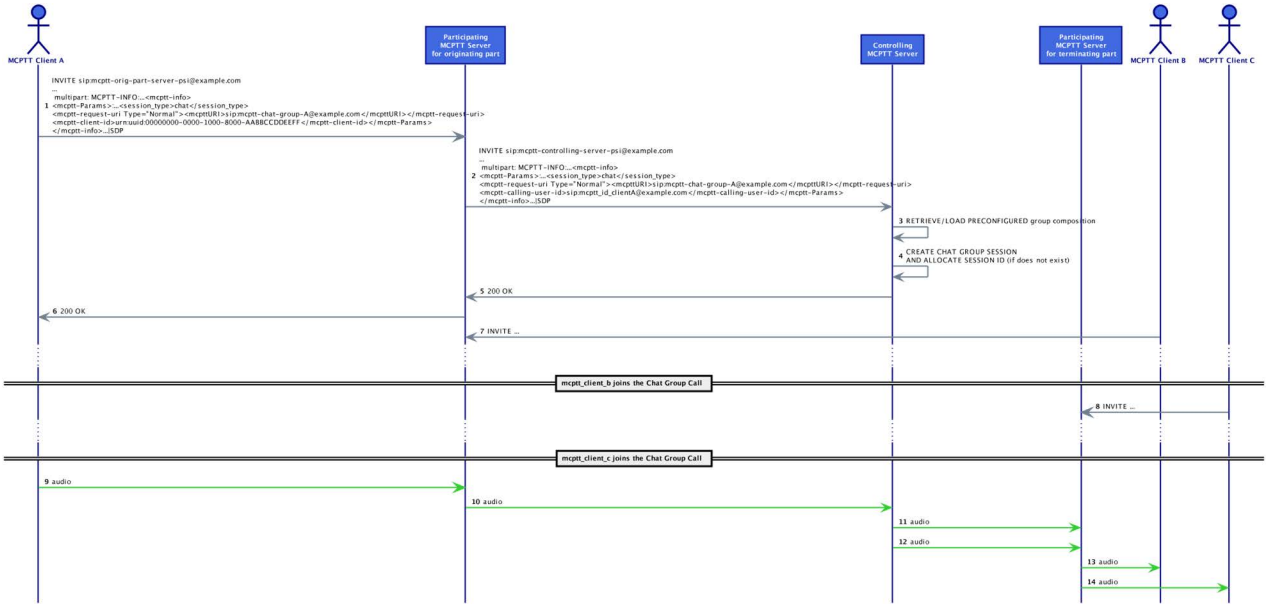

Figure 18: CONN/GROUP/CHAT/ONDEM/NFC/01 Message Sequence

Message Details

```
[1] INVITE MCPTT Caller/UE --> MCPTT Participating

INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-clientA@example.com>
Answer-Mode: Manual
Resource-Priority: mcpttp.5
Content-Type: multipart/mixed; boundary=[boundary]

--[boundary]
Content-Type: application/sdp

v=0
o=MCPTTCLIENT 1183811731 4248272445 IN IP4 IP
s=-
c=IN IP4 IP
t=0 0
m=audio PORT RTP/AVP 105
a=label:1
i=speech
a=rtpmap:105 AMR-WB/16000/1
a=fmtp:105 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
a=ptime:20
a=maxptime:240
m=application 1234 udp MCPTT
a=fmtp:MCPTT mc_queing;mc_priority=5;mc_granted;mc_implicit_request
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-client-id type="Normal">
      <mcpttURI>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttURI>
    </mcptt-client-id>
```

```
  </mcptt-Params>
</mcpttinfo>
--[boundary]


[2] INVITE MCPTT Participating --> MCPTT Controlling

INVITE sip:mcptt-controlling-server-psi@example.com SIP/2.0
To: <sip:mcptt-controlling-server-psi@example.com>
...

--[boundary]
Content-Type: application/sdp
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
...
...
...
```

Interoperability Test Description

Table 18: CONN/GROUP/CHAT/ONDEM/NFC/01

Interoperability Test Description			
Identifier	CONN/GROUP/CHAT/ONDEM/NFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of an on-demand Chat Group Call		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system and users properly affiliated to the called chat group		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) calls mcptt-chat-group-A
	2	check	Dialog creating INVITE received at the MCPTT participating server of mcptt_id_clientA@example.com after traversing SIP core/IMS
	3	check	INVITE received at the MCPTT controlling server
	4	check	The MCPTT controlling server loads the affiliated members of the mcptt-chat-group-A (either preconfigured or retrieved from the GMS), creates the session and returns a 200 OK to the callee. Upon no specific emergency/imminent peril indicator no (re)INVITE will sent to the other joined/not-joined affiliated members
	5	check	Users 2 and 3 repeat the same procedure
	6	verify	Call connected and multiple media flows exchanged

7.2.10 MCPTT User upgrades an ongoing on-demand Chat Group Call to emergency call [CONN/GROUP/CHAT/ONDEM/NFC/02]

This test covers the upgrade to emergency chat Group Call during an in-progress chat Group Call as defined in CONN/ONN/GROUP/CHAT/ONDEM/NFC/01 (clause 7.2.9).

There, the initial steps are totally equivalent but, upon a new risk or incident the MCPTT User triggers the emergency upgrade mechanism according to clauses 10.1.2.2.1.4, 10.1.2.2.1.2, 10.1.2.3.1.2, 10.1.2.3.1.4 and 10.1.2.4.1.2 in ETSI TS 124 379 [4].

A re-INVITE is triggered with the <emergency-ind> element (see clause 7.2.2 for more info) but with the proper <session-type> chat element.

The re-INVITE will be sent from the controlling function to all affiliated and joined members. Additionally in case there are affiliated but not joined members of the group, the controlling function shall send a new INVITE to them so that they are requested to join the group.

Message Sequence Diagram

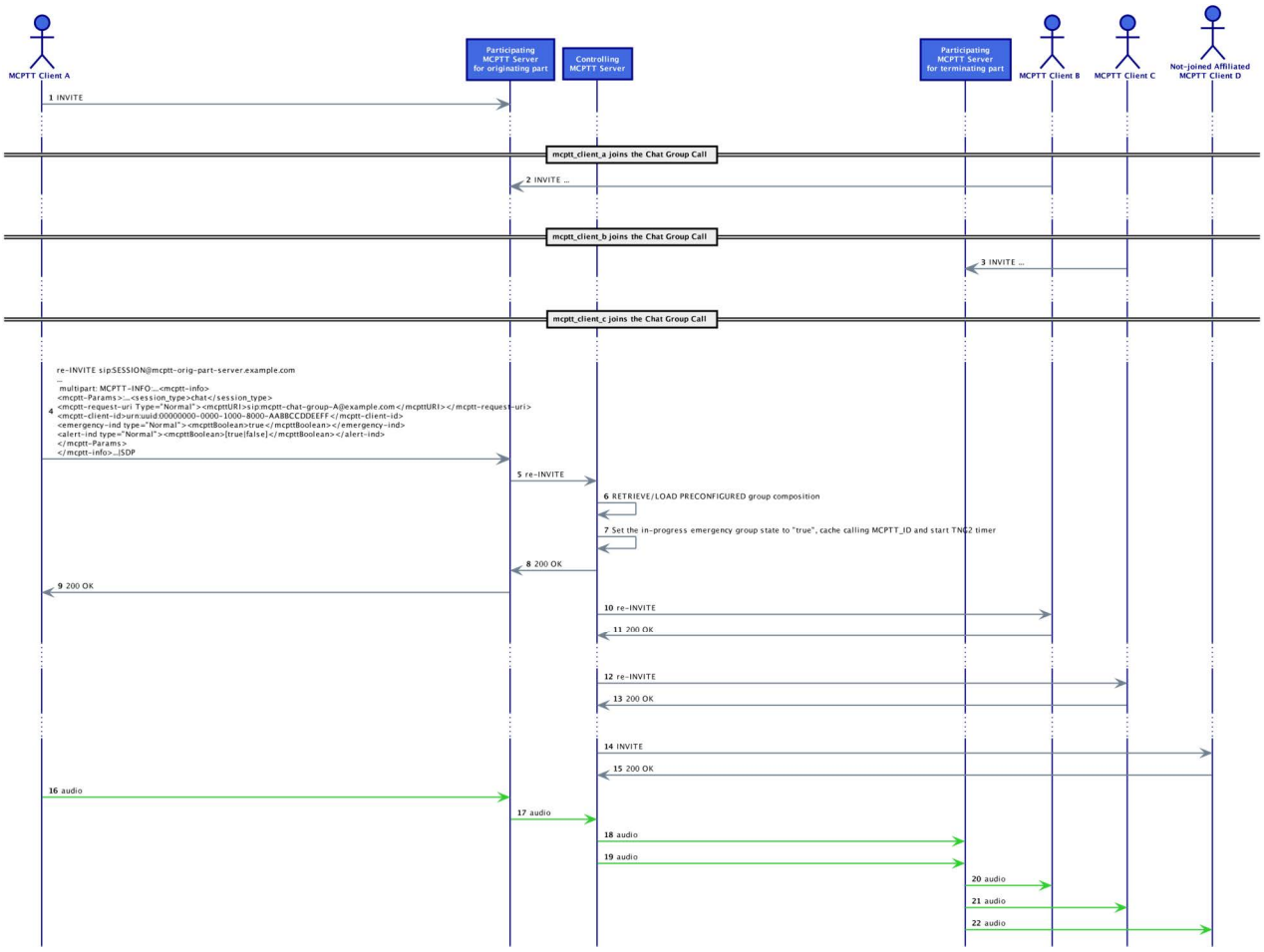

Figure 19: CONN/GROUP/CHAT/ONDEM/NFC/02 Message Sequence

Message Details

```
[1] INVITE MCPTT Caller/UE --> MCPTT Participating

INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-clientA@example.com>
Answer-Mode: Manual
Resource-Priority: mcpttp.5
Content-Type: multipart/mixed; boundary=[boundary]

--[boundary]
Content-Type: application/sdp

v=0
o=MCPTTCLIENT 1183811731 4248272445 IN IP4 IP
s=-
c=IN IP4 IP
t=0 0
m=audio PORT RTP/AVP 105
a=label:1
i=speech
a=rtpmap:105 AMR-WB/16000/1
a=fmtp:105 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
a=ptime:20
a=maxptime:240
m=application 1234 udp MCPTT
a=fmtp:MCPTT mc_queing;mc_priority=5;mc_granted;mc_implicit_request
```

```
...

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-client-id type="Normal">
      <mcpttURI>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttURI>
    </mcptt-client-id>
    <emergency-ind type="Normal">
      <mcpttBoolean>true</mcpttBoolean>
    </emergency-ind>
    <alert-ind type="Normal">
      <mcpttBoolean>[true|false]</mcpttBoolean>
    </alert-ind>
  </mcptt-Params>
</mcpttinfo>
--[boundary]


[2] INVITE MCPTT Participating --> MCPTT Controlling

INVITE sip:mcptt-controlling-server-psi@example.com SIP/2.0
To: <sip:mcptt-controlling-server-psi@example.com>
...

--[boundary]
Content-Type: application/sdp
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
    <emergency-ind type="Normal">
      <mcpttBoolean>true</mcpttBoolean>
    </emergency-ind>
    <alert-ind type="Normal">
      <mcpttBoolean>[true|false]</mcpttBoolean>
    </alert-ind>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
...
...
...
```

Interoperability Test Description

Table 19: CONN/GROUP/CHAT/ONDEM/NFC/02

Interoperability Test Description			
Identifier	CONN/GROUP/CHAT/ONDEM/NFC/02		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of the upgrade of an on-demand chat Group Call to emergency Call		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system and users properly affiliated to the called chat group • Ongoing on-demand chat Group Call where Clients A, B and C have joined (as in clause 7.2.9) while D has not		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) sends a re-INVITE to notify an emergency condition
	2	check	re-INVITE received at the MCPTT participating server of mcptt_id_clientA@example.com after traversing SIP core/IMS
	3	check	re-INVITE received at the MCPTT controlling server
	4	check	The MCPTT controlling server loads the affiliated members of the mcptt-chat-group-A (either preconfigured or retrieved from the GMS) and, upon emergency indicator, sends re-INVITE to joined users (B and C) and a new INVITE to D
	5	verify	Call still connected and emergency state set in all elements

7.2.11 MCPTT User upgrades an ongoing on-demand Chat Group Call to imminent-peril call [CONN/GROUP/CHAT/ONDEM/NFC/03]

This test covers the upgrade to imminent-peril chat Group Call during an in-progress chat Group Call as defined in CONN/ONN/GROUP/CHAT/ONDEM/NFC/01 (clause 7.2.9).

There, the initial steps are also equivalent to clause 7.2.10 but, upon a new risk or incident the MCPTT User triggers the imminent-peril upgrade mechanism according to clauses 10.1.2.2.1.4, 10.1.2.2.1.2, 10.1.2.3.1.2, 10.1.2.3.1.4 and 10.1.2.4.1.3 in ETSI TS 124 379 [4].

A re-INVITE is triggered with the <imminentperil-ind> element (see clause 7.2.3 for more info) with the proper <session-type> chat element. The controlling function shall update the group state according to the new condition. Later, the re-INVITE shall be sent from the controlling function to all joined affiliated members.

Additionally, in case there are affiliated but not joined members of the group, the controlling function shall send a new INVITE to them so that they are requested to join the group.

Message Sequence Diagram

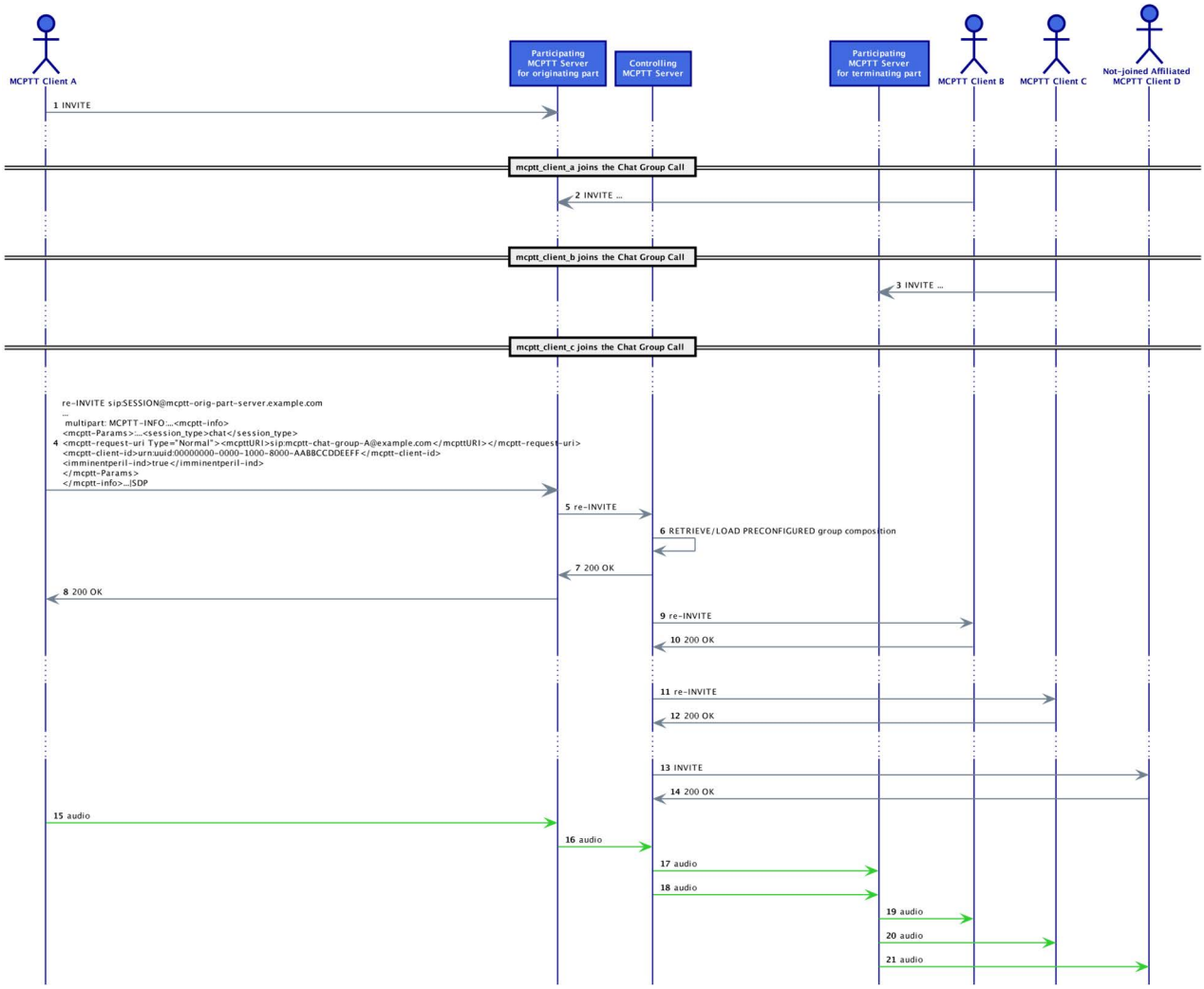

Figure 20: CONN/GROUP/CHAT/ONDEM/NFC/03 Message Sequence

Message Details

```
[1] INVITE MCPTT Caller/UE --> MCPTT Participating

INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-clientA@example.com>
Answer-Mode: Manual
Resource-Priority: mcpttp.5
Content-Type: multipart/mixed; boundary=[boundary]

--[boundary]
Content-Type: application/sdp

v=0
o=MCPTTCLIENT 1183811731 4248272445 IN IP4 IP
s=-
c=IN IP4 IP
t=0 0
m=audio PORT RTP/AVP 105
a=label:1
i=speech
a=rtpmap:105 AMR-WB/16000/1
a=fmtp:105 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
```

```
a=ptime:20
a=maxptime:240
m=application 1234 udp MCPTT
a=fmtp:MCPTT mc_queing;mc_priority=5;mc_granted;mc_implicit_request
...

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-client-id type="Normal">
      <mcpttURI>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttURI>
    </mcptt-client-id>
    <imminentperil-ind>true</imminentperil-ind>
  </mcptt-Params>
</mcpttinfo>
--[boundary]


[2] INVITE MCPTT Participating --> MCPTT Controlling

INVITE sip:mcptt-controlling-server-psi@example.com SIP/2.0
To: <sip:mcptt-controlling-server-psi@example.com>
...

--[boundary]
Content-Type: application/sdp
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
    <imminentperil-ind>true</imminentperil-ind>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
...
...
...
```

Interoperability Test Description

Table 20: CONN/GROUP/CHAT/ONDEM/NFC/03

Interoperability Test Description			
Identifier	CONN/GROUP/CHAT/ONDEM/NFC/03		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of the upgrade of an on-demand chat Group Call to imminent-peril		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system and users properly affiliated to the called chat group • Ongoing on-demand chat Group Call where Clients A, B and C have joined (as in clause 7.2.9) while D has not		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) sends a re-INVITE to notify an imminent-peril condition
	2	check	re-INVITE received at the MCPTT participating server of mcptt_id_clientA@example.com after traversing SIP core/IMS
	3	check	re-INVITE received at the MCPTT controlling server
	4	check	The MCPTT controlling server loads the affiliated members of the mcptt-chat-group-A (either preconfigured or retrieved from the GMS) and, upon imminent-peril indicator, sends re-INVITE to joined users (B and C) and a new INVITE to D
	5	verify	Call still connected and imminent-peril state set in all elements

7.2.12 MCPTT User cancels the emergency condition of an on-demand Chat Group Call [CONN/GROUP/CHAT/ONDEM/NFC/04]

This test covers the cancellation by an User of the in-progress emergency condition of a Chat Group Call.

Upon receiving such a request the MCPTT client shall set the group state to the proper states (MEG 1: no-emergency and MEGC 1: emergency-gc-capable) and generate a SIP re-INVITE request with the new indicators in the mcptt-info XML body according to clause 10.1.2.2.1.3 in ETSI TS 124 379 [4]. The controlling function shall forward the re-INVITE to all the affiliated and joined members of the group and shall send a MESSAGE to any possible affiliated but not joined members.

Message Sequence Diagram

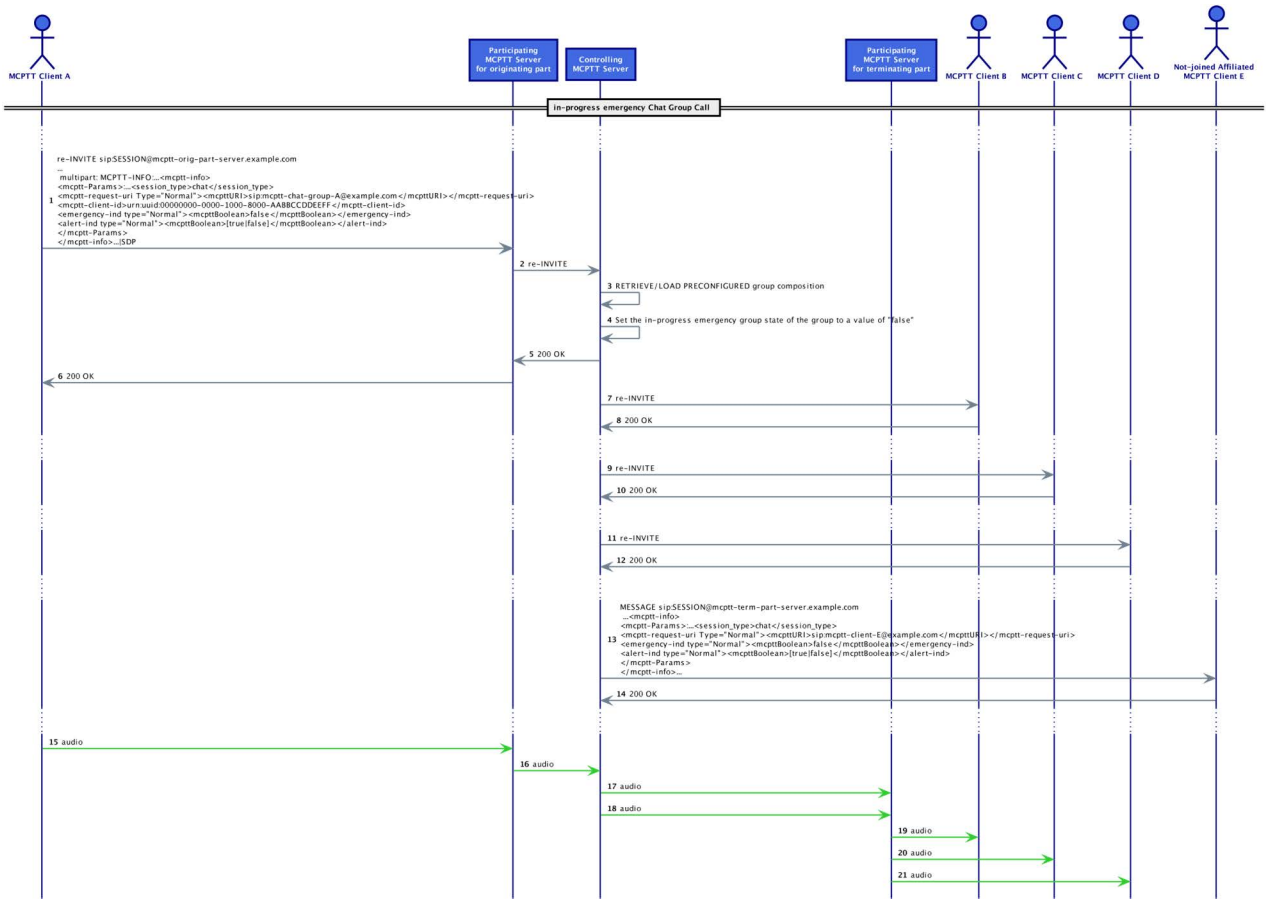

Figure 21: CONN/GROUP/CHAT/ONDEM/NFC/04 Message Sequence

Message Details

```
[1] INVITE MCPTT Caller/UE --> MCPTT Participating

INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-clientA@example.com>
Answer-Mode: Manual
Resource-Priority: mcpttp.5
Content-Type: multipart/mixed; boundary=[boundary]

--[boundary]
Content-Type: application/sdp

v=0
o=MCPTTCLIENT 1183811731 4248272445 IN IP4 IP
s=-
c=IN IP4 IP
t=0 0
m=audio PORT RTP/AVP 105
a=label:1
i=speech
a=rtpmap:105 AMR-WB/16000/1
a=fmtp:105 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
a=ptime:20
a=maxptime:240
m=application 1234 udp MCPTT
a=fmtp:MCPTT mc_queing;mc_priority=5;mc_granted;mc_implicit_request
...
--[boundary]
```

```
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-client-id type="Normal">
      <mcpttURI>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttURI>
    </mcptt-client-id>
    <broadcast-ind>true</broadcast-ind>
  </mcptt-Params>
</mcpttinfo>
--[boundary]


[2] INVITE MCPTT Participating --> MCPTT Controlling

INVITE sip:mcptt-controlling-server-psi@example.com SIP/2.0
To: <sip:mcptt-controlling-server-psi@example.com>
...

--[boundary]
Content-Type: application/sdp
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
    <broadcast-ind>true</broadcast-ind>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
...
...
...
```

Interoperability Test Description

Table 21: CONN/GROUP/CHAT/ONDEM/NFC/04

Interoperability Test Description			
Identifier	CONN/GROUP/CHAT/ONDEM/NFC/04		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of cancellation of the in-progress emergency condition of a chat Group Call		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system and users properly affiliated to the called chat group • Ongoing on-demand emergency chat Group Call		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) sends a re-INVITE to notify the ongoing chat Group Call losing the emergency conditions
	2	check	re-INVITE received at the MCPTT participating server of mcptt_id_clientA@example.com after traversing SIP core/IMS
	3	check	re-INVITE received at the MCPTT controlling server
	4	check	The MCPTT controlling server loads the joined members of the mcptt-chat-group-A and sends re-INVITE to all of them
	5	check	The MCPTT controlling server sends a SIP MES-SAGE to affiliated but not joined members
	6	verify	Call still connected and emergency state "removed" in all elements

7.2.13 MCPTT User cancels the imminent-peril condition of an on-demand Chat Group Call [CONN/GROUP/CHAT/ONDEM/NFC/05]

This test covers the cancellation by an User of the in-progress imminent-peril condition of an Chat Group Call.

Upon receiving such a request the MCPTT client shall set the group state to the proper states (MIG 1: no-imminent-peril and MIGC 1: imminent-peril-gc-capable) and generate a SIP re-INVITE request with the new indicators in the mcptt-info XML body according to clause 10.1.2.2.1.5 in ETSI TS 124 379 [4].

The controlling function shall forward the re-INVITE to all the affiliated and joined members of the group and shall send a MESSAGE to any possible affiliated but not joined members.

Message Sequence Diagram

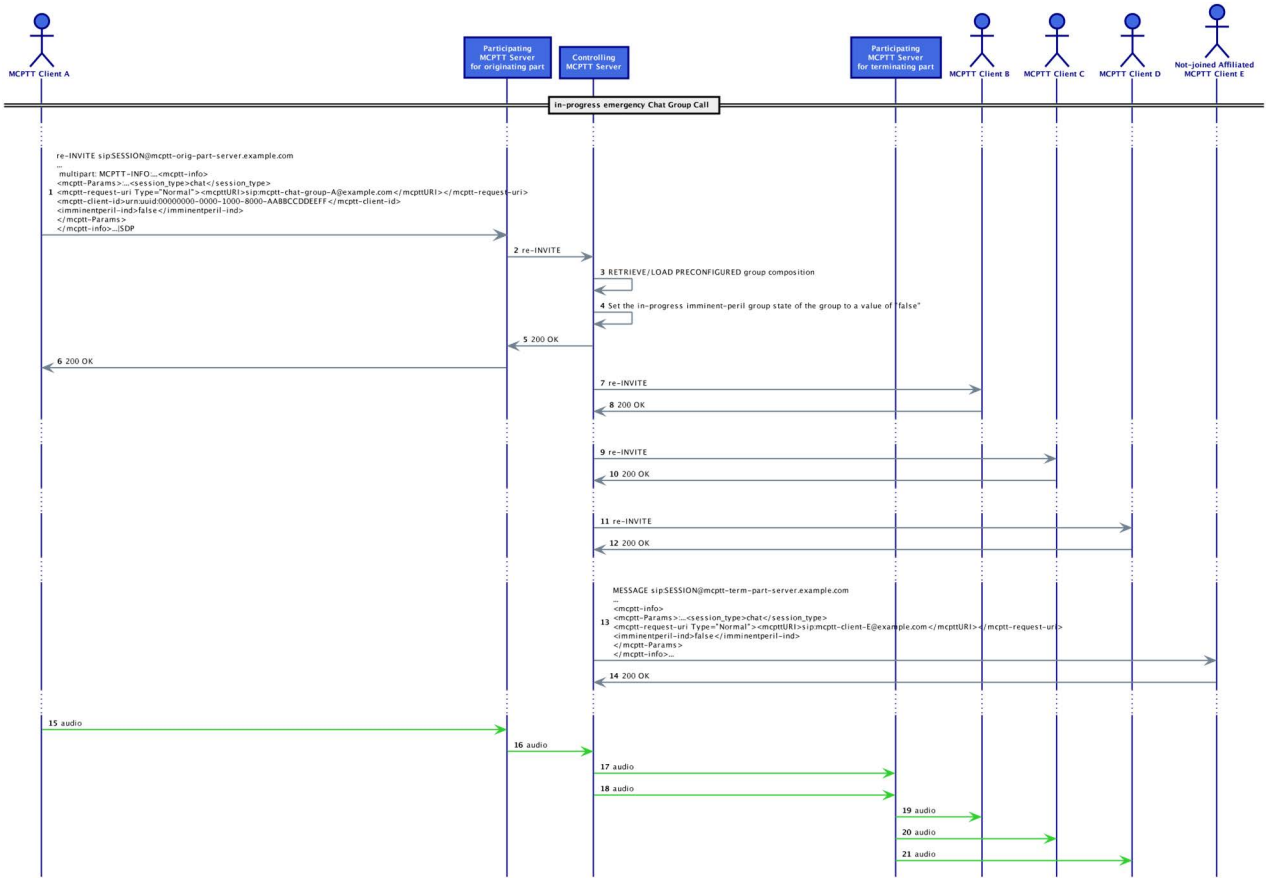

Figure 22: CONN/GROUP/CHAT/ONDEM/NFC/05 Message Sequence

Message Details

```
[8] re-INVITE MCPTT Caller/UE --> MCPTT Participating

[re]INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
To: <sip:mcptt-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-clientA@example.com>
Answer-Mode: Manual
Resource-Priority: mcpttp.5
Content-Type: multipart/mixed; boundary=[boundary]

--[boundary]
Content-Type: application/sdp

v=0
o=MCPTTCLIENT 1183811731 4248272445 IN IP4 IP
s=-
c=IN IP4 IP
t=0 0
m=audio PORT RTP/AVP 105
a=label:1
i=speech
a=rtpmap:105 AMR-WB/16000/1
a=fmtp:105 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
a=ptime:20
a=maxptime:240
m=application 1234 udp MCPTT
a=fmtp:MCPTT mc_queing;mc_priority=5;mc_granted;mc_implicit_request
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml
```

```
<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-client-id type="Normal">
      <mcpttURI>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttURI>
    </mcptt-client-id>
    <emergency-ind type="Normal">
      <mcpttBoolean>true</mcpttBoolean>
    </emergency-ind>
    <alert-ind type="Normal">
      <mcpttBoolean>[true|false]</mcpttBoolean>
    </alert-ind>
  </mcptt-Params>
</mcpttinfo>
--[boundary]


[9] re-INVITE MCPTT Participating --> MCPTT Controlling

[re]INVITE sip:mcptt-controlling-server-psi@example.com SIP/2.0
To: <sip:mcptt-controlling-server-psi@example.com>
...

--[boundary]
Content-Type: application/sdp
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <session-type>prearranged</session-type>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
    <emergency-ind type="Normal">
      <mcpttBoolean>true</mcpttBoolean>
    </emergency-ind>
    <alert-ind type="Normal">
      <mcpttBoolean>[true|false]</mcpttBoolean>
    </alert-ind>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
...
...
...
```

Interoperability Test Description

Table 22: CONN/GROUP/CHAT/ONDEM/NFC/05

Interoperability Test Description			
Identifier	CONN/GROUP/CHAT/ONDEM/NFC/05		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of cancellation of the in-progress imminent-peril condition of a chat Group Call		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system and users properly affiliated to the called chat group • Ongoing on-demand imminent-peril chat Group Call		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) sends a re-INVITE to notify the ongoing chat Group Call losing the emergency conditions
	2	check	re-INVITE received at the MCPTT participating server of mcptt_id_clientA@example.com after traversing SIP core/IMS
	3	check	re-INVITE received at the MCPTT controlling server
	4	check	The MCPTT controlling server loads the joined members of the mcptt-chat-group-A and sends re-INVITE to all of them
	5	check	The MCPTT controlling server sends a SIP MESSAGE to affiliated but not joined members
	6	verify	Call still connected and imminent-peril state "removed" in all elements

7.2.14 MCPTT User initiates a Chat group Call using pre-established session [CONN/GROUP/CHAT/PRE/NFC/01]

This test case comprises the establishment of a "regular" Chat Group Call (i.e. neither emergency nor imminent-peril Chat Group Call) using pre-established session. The procedures are similar to those in clause 7.2.7 but use specific Chat Group Call elements in the signalling as explained in clauses 10.1.2.2.2, 10.1.2.2.1.6, 10.1.2.3.2.1, 10.1.2.3.2.2 and 10.1.2.4.1.1 in ETSI TS 124 379 [4].

Therefore, after a successful establishment of all the sessions of the members the originating MCPTT User shall send a SIP REFER with the Request URI that of the session identity of the pre-established session. In the application/resource-lists MIME body a single <entry> element containing a "uri" attribute set to the chat group identity, extended with an hname "body" URI header field populated with the data to be transferred to the Chat Group INVITE to be sent to the Controlling (i.e. an application/sdp MIME body containing an SDP offer if the session parameters of the pre-established session require modification or if implicit floor control is required and an application/vnd.3gpp.mcptt-info MIME body with the <session-type> element set to a value of "chat"; and the <mcptt-client-id> element set to the MCPTT client ID of the originating MCPTT client).

Later, the participating function shall create the INVITE to be forwarded to the controlling that will handle it following the same procedures as in clause 7.2.9.

If other affiliated members of the group want to use their pre-established sessions to join the Chat Group Call they shall repeat the procedure.

Message Sequence Diagram

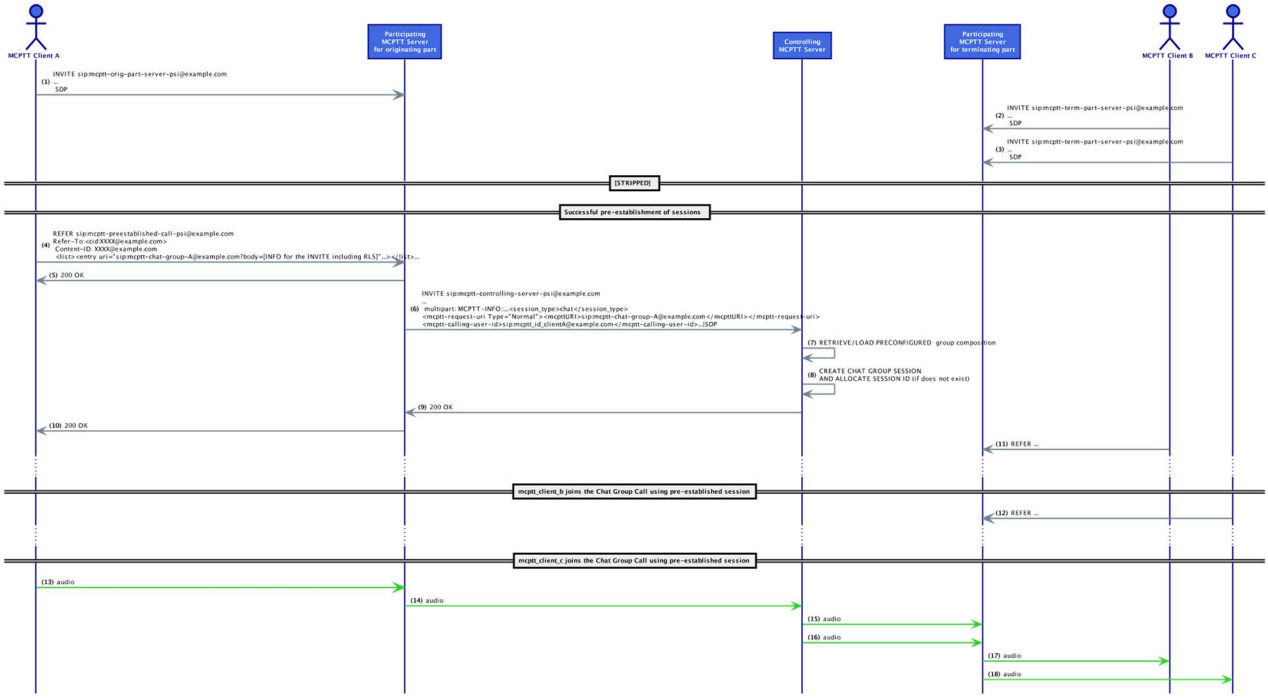

Figure 23: CONN/GROUP/CHAT/PRE/NFC/01 Message Sequence

Message Details

[3] REFER MCPTT Caller/UE --> MCPTT Participating

REFER sip:mcptt-preestablished-session-psi@example.com **SIP/2.0**

From: <sip:mcptt-client-A@example.com>;tag=ABCD

To: <sip:mcptt-preestablished-session-psi@example.com>

Contact: <sip:mcptt-client-A@IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3

A3gpp-service.ims.icsi.mcptt";+g.3gpp.mcptt

CSeq: 2 **REFER**

P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt

P-Asserted-Identity: <sip:mcptt-client-A@example.com>

Supported: norefersub

Refer-Sub: false

Require: multiple-refer

Target-Dialog: 1-26282@IP;local-tag=1;remote-tag=y1DK7rrj2ag0m

Content-Type: application/resource-lists+xml

Resource-Priority: mcpttp.5

Refer-To: <cid:g8QyvQSQ0rBgy7tg8gt45@example.com> **Content-ID:** g8QyvQSQ0rBgy7tg8gt45@example.com

```
<?xml version="1.0" encoding="UTF-8" ?>
  <resource-lists xmlns="urn:ietf:params:xml:ns:resource-lists"
      xmlns:cc="urn:ietf:params:xml:ns:copycontrol"> <list>
          <entry uri="sip:mcptt_id_clientB@example.com?
body=--YKP42ALY6Zy3ey%0AContent-Type%3A%20application%2Fvnd.3gpp.mcptt-info
%2Bxml%0A%0A%3C%3Fxml%20version%3D%221.0%22%20encoding%3D%22UTF-8%22%3F%3E
%0A%3Cmcpttinfo%20xmlns%3D%22urn%3A3gpp%3Ans%3AmcpttInfo%3A1.0%22%20xmlns%3
Axsi%3D%22http%3A%2F%2Fwww.w3.org%2F2001%2FXMLSchema-instance%22%3E%20%0A
%20%20%3Cmcptt-Params%3E%20%0A%20%20%20%20%3Csession-type%3Echat%3C%2 Fsession-
type%3E%0A%20%20%20%20.....Content-Type%3A%20application%2Fsdp%0A
%0Av%3D0%0Ao%3i....-YKP42ALY6Zy3ey--&amp;amp;Answer-Mode=Auto&amp;amp; Content-
Type=multipart%2Fmixed%3Bboundary%3DYKP42ALY6Zy3ey" cc:copyControl="to"/>
          </list>
      </resource-lists>
```

Interoperability Test Description

Table 23: CONN/GROUP/CHAT/PRE/NFC/01

Interoperability Test Description			
Identifier	CONN/GROUP/CHAT/PRE/NFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a Chat Group Call using pre-established sessions		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system and users properly affiliated to the called chat group		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) pre-establishes a session
	2	check	Pre-established session is established
	3	check	The rest of affiliated Users successfully complete the pre-establishment of their sessions
	4	stimulus	User 1 (mcptt_id_clientA@example.com) calls mcptt-chat-group-A using his/her pre-established session
	5	check	The REFER arrives at the participating which forwards the associated reINVITE to the controlling function. The latter activates the Chat Group Call
	6	check	Users 2 and 3 repeat the same procedure
	7	verify	Call connected and multiple media flows exchanged

7.2.15 MCPTT User initiates an on-demand private MCPTT call in automatic commencement model with floor control [CONN/PRIV/AUTO/ONDEM/WFC/NFC/01]

This test shall verify a pure private automatic on-demand call with floor control and MCPTT users in the same MCPTT system as defined in clause 10.7.2.2.1 in ETSI TS 123 179 [2]. Specific procedures for private calls with floor control are defined in clause 11.1.1 in ETSI TS 124 379 [4].

Note that WFC stands for "with floor control" and NFC "no floor control". Even though it referred to floor control (half-duplex) calls, SIP connectivity only will be tested. Additionally, unless explicitly indicated, the audio flow related arrows simply depicts the half/full duplex conversation, therefore FC mechanisms will be omitted.

The automatic commencement model indicates the terminating Client will take the call without interacting with the User (see IETF RFC 5373 [18] for the message format in the originating User -specially AnswerMode header- and procedures in the terminating User in clause 6.2.3.1.1 in ETSI TS 124 379 [4]).

Message Sequence Diagram

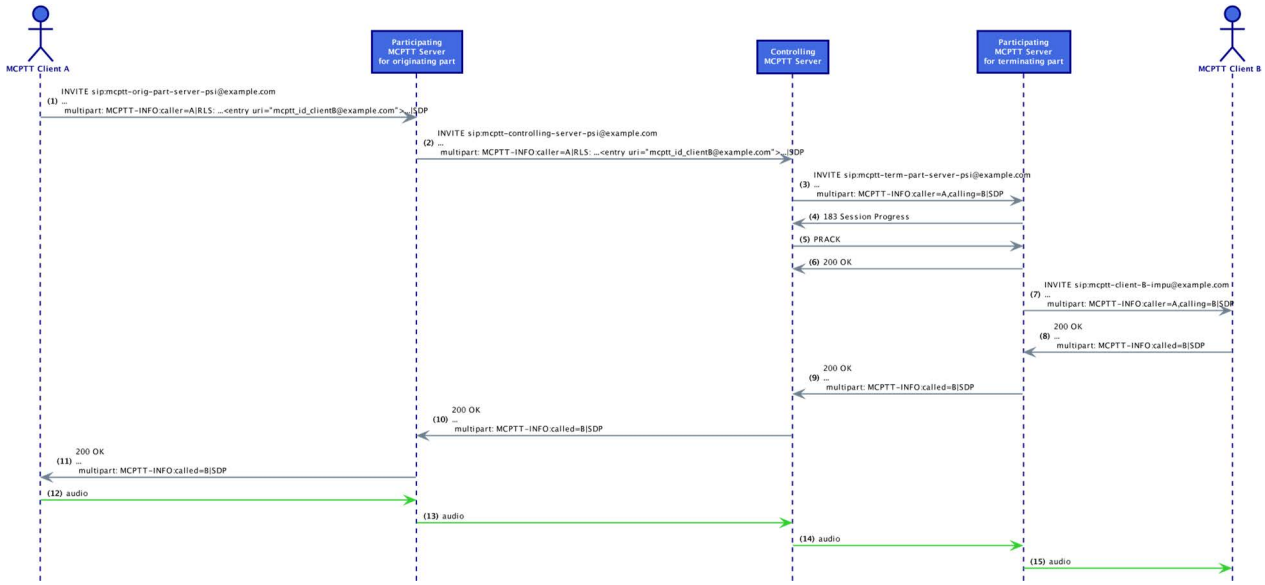

Figure 24: CONN/PRIV/AUTO/ONDEM/WFC/NFC/01 Message Sequence

Message Details

```
[1] INVITE MCPTT Caller/UE --> MCPTT Participating

INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
 Via: SIP/2.0/UDP IP:PORT;branch=BRANCH
 From: <sip:mcptt-client-A-impu@example.com>;tag=TAG
 To: <sip:mcptt-server-orig-part-psi@example.com>
 Contact: <sip:mcptt-client-A-impu@IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-
service.ims.icsi.mcptt";+g.3gpp.mcptt
 ...
 Accept-Contact: *;+g.3gpp.mcptt;require;explicit
 Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
 P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
 [Privacy: id]
 P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
 Answer-Mode: Auto
 Content-Type: multipart/mixed; boundary=[boundary]

 --[boundary]
 Content-Type: application/vnd.3gpp.mcptt-info+xml

 <?xml version="1.0" encoding="UTF-8"?>
 <mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
   <mcptt-Params>
     <session-type>private</session-type>
```

```
   </mcptt-Params>
 </mcpttinfo>

 --[boundary]
 Content-Type: application/resource-lists+xml

 <?xml version="1.0" encoding="UTF-8"?>
 <resource-lists xmlns="urn:ietf:params:xml:ns:resource-lists"
xmlns:cc="urn:ietf:params:xml:ns:copycontrol">
   <list>
     <entry uri="sip:mcptt_id_clientB@example.com" cc:copyControl="to"/>
   </list>
 </resource-lists>

 --[boundary]
 Content-Type: application/sdp

 ...

 --[boundary]--
```

Interoperability Test Description

Table 24: CONN/PRIV/AUTO/ONDEM/WFC/NFC/01

Interoperability Test Description			
Identifier	CONN/PRIV/AUTO/ONDEM/WFC/NFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a private call with automatic commencement mode		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) calls User 2 (mcptt_id_clientB@example.com)
	2	check	Dialog creating INVITE received at the MCPTT participating server of User 1
	3	check	The participating server adapts the mcptt-info accordingly and creates an INVITE to the controlling server
	4	check	The controlling server check permissions and forward the INVITE to the participating server of the callee
	5	check	Upon arrival of the INVITE adapted by the terminating participating function at User 2 the call is automatically taken
	6	verify	Call connected and media flows exchanged

7.2.16 MCPTT User initiates an on-demand private MCPTT call in manual commencement model with floor control [CONN/PRIV/MANUAL/ONDEM/WFC/NFC/01]

This test covers the Manual commencement mode of the private call. Therefore the INVITE should include an Answer-Mode header field with the value "Manual" according to the rules and procedures of IETF RFC 5373 [18] while in test CONN/ONN_OTT/PRIV/AUTO/ONDEM/WFC/NFC/01 covered in clause 7.2.15 the value of the header should be "Auto". The resulting procedure is quite equivalent but 180 Ringing packet is now generated and forwarded to the inviting MCPTT user.

Message Sequence Diagram

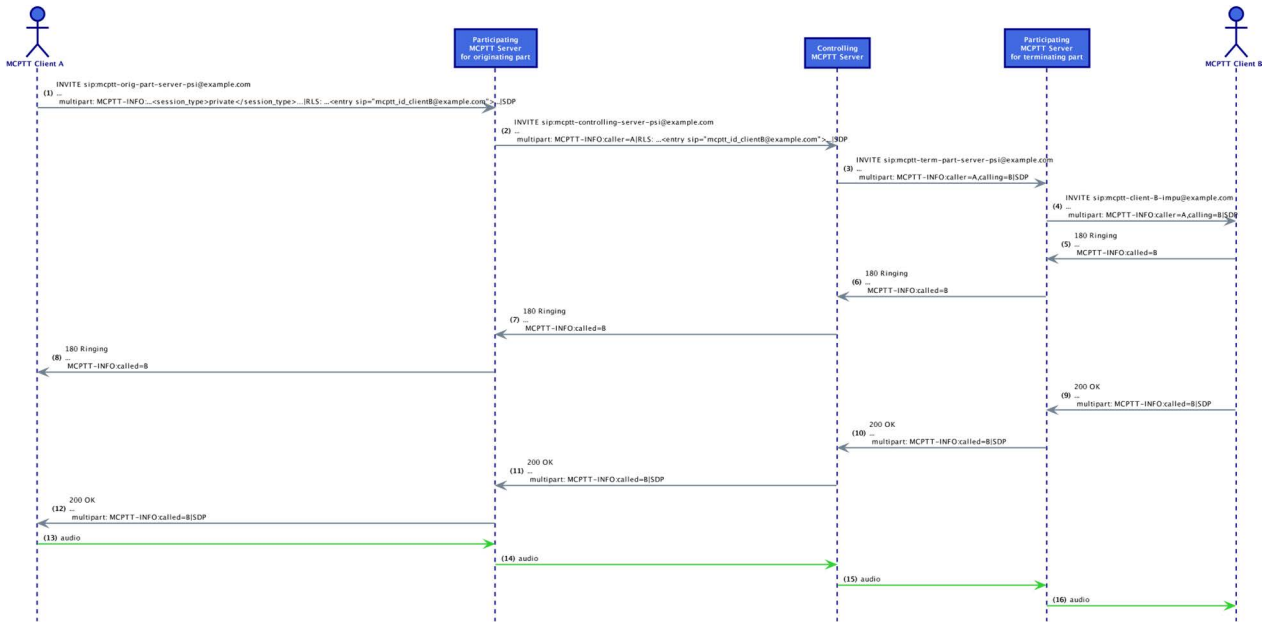

Figure 25: CONN/PRIV/MANUAL/ONDEM/WFC/NFC/01 Message Sequence

Message Details

The initial **INVITE** would be equivalent to that in clause 8.2.1 but with the header: **Answer-Mode: Manual**

Interoperability Test Description

Table 25: CONN/PRIV/MANUAL/ONDEM/WFC/NFC/01

Interoperability Test Description			
Identifier	CONN/PRIV/MANUAL/ONDEM/WFC/NFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a private call with manual commencement mode		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) calls User 2 (mcptt_id_clientB@example.com)
	2	check	Dialog creating INVITE received at the MCPTT participating server of User 1
	3	check	The participating server adapts the mcptt-info accordingly and creates an INVITE to the controlling server
	4	check	The controlling server check permissions and forward the INVITE to the participating server of the callee
	5	check	Upon arrival of the INVITE adapted by the terminating participating function to the terminating Client User 2 is notified
	6	check	User 2 accepts the private call and all the signalling is completed
	7	verify	Call connected and media flows exchanged

7.2.17 MCPTT User initiates a pre-established private MCPTT call in automatic commencement model with floor control [CONN/PRIV/AUTO/PRE/WFC/NFC/01]

This test shall verify a pure private automatic pre-established call with floor control and MCPTT users in the same MCPTT system as defined in clause 10.7.2 in ETSI TS 123 179 [2]. Most procedures are described in clause 8 (for pre-establishment), clause 11.1.1.2.2 (for private call) in ETSI TS 124 379 [4] and clause 9 in ETSI TS 124 380 [5] (for Floor Controlling mechanisms).

According to clause 10.5 in ETSI TS 123 179 [2] a MCPTT client establishes one or more pre-established sessions to an MCPTT server after SIP registration, and prior to initiating any of the above procedures to other MCPTT users. When establishing a pre-established session, the MCPTT client negotiates the media parameters to reduce call setup delay by avoiding the need to negotiate media parameters and reserving bearer resources during the MCPTT call. In fact after the pre-established session is established, the media bearer carrying the floor control messages shall be always active. Additionally, the MCPTT client shall be able to activate the media bearer carrying the voice whenever needed:

- Immediately after the pre-established session procedure; or
- Using SIP signalling when an MCPTT call is initiated.

Considering that both the originating and terminating user may or may not have a pre-established session, the procedure varies according to those combinations.

For an incoming MCPTT call setup for a private call using a pre-established session, an MCPTT UE is notified of the start of the MCPTT call control using SIP procedures in manual commencement mode and using floor control procedures in automatic commencement mode. Therefore sequence diagrams in clauses 7.2.17 and 7.2.18 differ in the notification to the callee. On-Network pre-established sessions in both cases demand:

- MCPTT client: procedures specified in clauses 8.2.1, 8.3.1 and 8.4.1 in ETSI TS 124 379 [4], and the procedures specified in ETSI TS 124 380 [5].
- MCPTT server: procedures specified in clauses 8.2.2, 8.3.2 and 8.4.2 in ETSI TS 124 379 [4], and the procedures specified in ETSI TS 124 380 [5].

Message Sequence Diagram

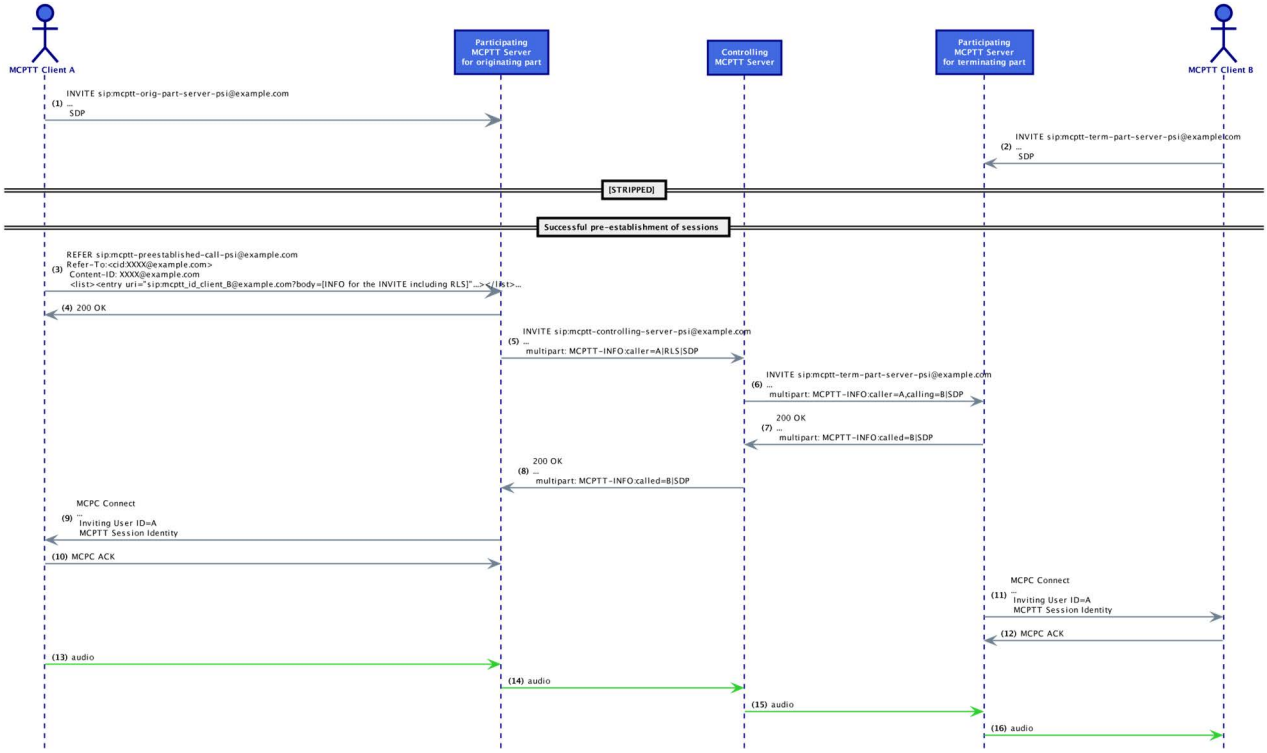

Figure 26: CONN/PRIV/AUTO/PRE/WFC/NFC/01 Message Sequence

Message Details

```
[3] REFER MCPTT Caller/UE --> MCPTT Participating

REFER sip:mcptt-preestablished-session-psi@example.com SIP/2.0
From: <sip:mcptt-client-A@example.com>;tag=ABCD
To: <sip:mcptt-preestablished-session-psi@example.com>
Contact: <sip:mcptt-client-A@IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-
service.ims.icsi.mcptt";+g.3gpp.mcptt
CSeq: 2 REFER
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-client-A@example.com>
Supported: norefersub
Refer-Sub: false
Require: multiple-refer
Target-Dialog: 1-26282@IP;local-tag=1;remote-tag=y1DK7rrj2ag0m
Content-Type: application/resource-lists+xml
Resource-Priority: mcpttp.5
Refer-To: <cid:g8QyvQSQ0rBgy7tg8gt45@example.com>
Content-ID: g8QyvQSQ0rBgy7tg8gt45@example.com

<?xml version="1.0" encoding="UTF-8"?>
```

```
<resource-lists xmlns="urn:ietf:params:xml:ns:resource-lists"
xmlns:cc="urn:ietf:params:xml:ns:copycontrol">
<list>
<entry uri="sip:mcptt_id_clientB@example.com?body=--YKP42ALY6Zy3ey%0AContent-
Type%3A%20application%2Fvnd.3gpp.mcptt-
info%2Bxml%0A%0A%3C%3Fxml%20version%3D%221.0%22%20encoding%3D%22UTF-
8%22%3F%3E%0A%3Cmcpttinfo%3E%20%0A%20%20%3Cmcptt-Params%3E%20%0A%20%20%20%20%3Csession-
type%3Eprivate%3C%2Fsession-type%3E%0A%20%20%20%20%3Cmcptt-calling-user-
id%3Esip:mcptt_id_clientA@example.com%3C%2Fmcptt-calling-user-id%3E%20%0A%20%20%3C%2Fmcptt-
Params%3E%20%0A%3C%2Fmcpttinfo%3E%20%0A%0A--YKP42ALY6Zy3ey%0AContent-
Type%3A%20application%2Fresource-
lists%2Bxml%0A%0A%3C%3Fxml%20version%3D%221.0%22%20encoding%3D%22UTF-8%22%3F%3E%0A%3Cresource-
lists%20xmlns%3D%22urn%3Aietf%3Aparams%3Axml%3Ans%3Aresource-
lists%22%20xmlns%3Acc%3D%22urn%3Aietf%3Aparams%3Axml%3Ans%3Acopycontrol%22%3E%0A%20%20%3Clist%3E%0A%
20%20%20%20%3Centry%20uri%3D%22sip:mcptt_id_clientB@example.com%22%20cc%3AcopyControl%3D%22to%22%2F%
3E%0A%20%20%3C%2Flist%3E%0A%3C%2Fresource-lists%3E%0A%0A--YKP42ALY6Zy3ey%0AContent-
Type%3A%20application%2Fsdp%0A%0Av%3D0%0Ao%3DMCPTTCLIENT%201183811731%204248272445%20IN%20IP4%20IP%0
As%3D-
%0Ac%3DIN%20IP4%20IP%0At%3D0%200%0Am%3Daudio%2012000%20RTP%2FAVP%2099%0Aa%3Dlabel%3A1%0Ai%3Dspeech%0
Aa%3Drtpmap%3A99%20AMR-WB%2F16000%2F1%0Aa%3Dfmtp%3A99%20mode-change-period%3D1%3B%20mode-change-
capability%3D2%3B%20mode-change-neighbor%3D0%3B%20max-
red%3D0%0Aa%3Dptime%3A20%0Aa%3Dmaxptime%3A240%0Am%3Dapplication%201234%20udp%20MCPTT%0Aa%3Dfmtp%3AMC
PTT%20mc_queueing%3Bmc_priority%3D5%3Bmc_implicit_request%0A%0A--YKP42ALY6Zy3ey--&amp;amp;Answer-
Mode=Auto&amp;amp;Content-Type=multipart%2Fmixed%3Bboundary%3DYKP42ALY6Zy3ey" cc:copyControl="to"/>
</list>
</resource-lists>
```

Interoperability Test Description

Table 26: CONN/PRIV/AUTO/PRE/WFC/NFC/01

Interoperability Test Description			
Identifier	CONN/PRIV/AUTO/PRE/WFC/NFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a private call with automatic commencement mode using pre-established sessions		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	The MCPTT clients of User 1 (mcptt_id_clientA@example.com) and User 2 (mcptt_id_clientB@example.com) pre-establish their respective session to the proper participating
	2	check	Sessions pre-established
	3	stimulus	User 1 calls User 2 using pre-established session
	4	check	REFER is created and sent to the participating server of User 1
	5	check	The participating server creates the proper INVITE with the data embedded in the REFER and forwards it to the controlling
	6	check	The controlling server forwards the INVITE to the participating server of the callee and sends a 200 back to the participating of the caller
	7	check	The participating of the caller notifies him/her using MCPC (Floor Control) Connect message
	8	check	Similarly Client User 2 is notified with MCPC Connect and Call automatically accepted
	9	verify	Call connected and media flows exchanged

7.2.18 MCPTT User initiates a pre-established private MCPTT call in manual commencement model with floor control [CONN/ONN/PRIV/MANUAL/ONDEM/WFC/NFC/01]

As specified in clause 6.3.2.2.6.3 of ETSI TS 124 379 [4] the procedure is equivalent to the Automatic mode but includes a new SIP signalling procedure in the terminating part and upon receiving a SIP 200 (OK) response to the SIP re-INVITE request, the participating MCPTT function sends a MCPC Connect message, in order to give MCPTT session identity to the terminating MCPTT client. The MCPTT client B accepts the invitation and sends an MCPC Acknowledge message as described in ETSI TS 124 380 [5], annex A.

Message Sequence Diagram

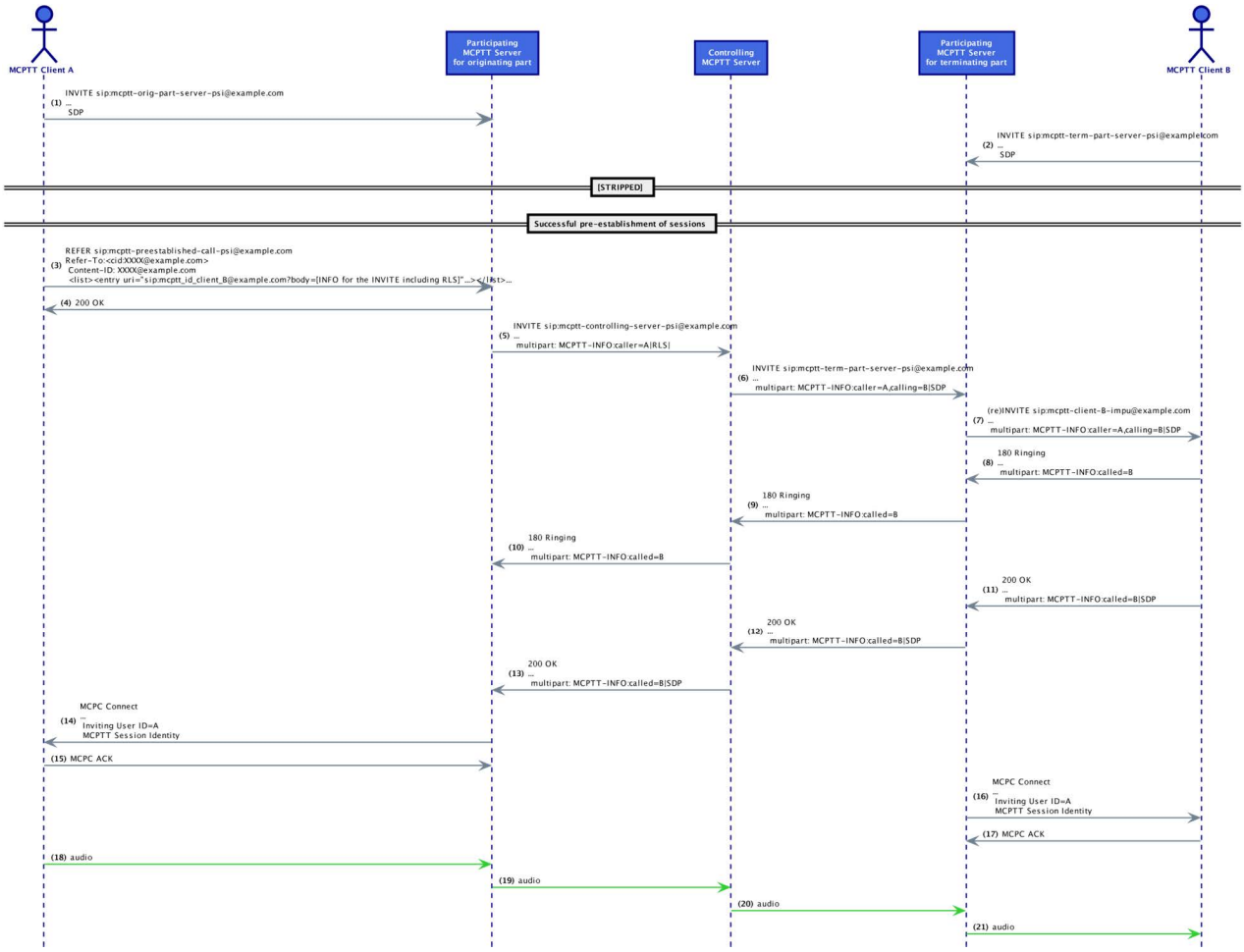

Figure 27: CONN/ONN/PRIV/MANUAL/ONDEM/WFC/NFC/01 Message Sequence

Message Details

Equivalent to that in **Auto** Mode (clause 8.2.3) but with the header Answer-Mode=Manual in the body header of the URI attribute of the <entry> element in the application/resource-lists MIME body of the **REFER** message.

Interoperability Test Description

Table 27: CONN/ONN/PRIV/MANUAL/ONDEM/WFC/NFC/01

Interoperability Test Description			
Identifier	CONN/ONN/PRIV/MANUAL/ONDEM/WFC/NFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a private call with manual commencement mode using pre-established sessions		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	The MCPTT clients of User 1 (mcptt_id_clientA@example.com) and User 2 (mcptt_id_clientB@example.com) pre-establish their respective session to the proper participating
	2	check	Sessions pre-established
	3	stimulus	User 1 calls User 2 using pre-established session
	4	check	REFER is created and sent to the participating server of User 1
	5	check	The participating server creates the proper INVITE with the data embedded in the REFER and forwards it to the controlling
	6	check	The controlling server forwards the INVITE to the participating server of the callee and sends a 200 ok back to the participating of the caller
	7	check	The participating of the caller notifies him/her by sending a (re)INVITE with the SDP of the callee
	8	check	User 2 answers the call and MCPC Connect messages are triggered by both participating servers
	9	verify	Call connected and media flows exchanged

7.2.19 MCPTT User initiates an on-demand private MCPTT call in automatic commencement model without floor control [CONN/PRIV/AUTO/ONDEM/WOFC/01]

This test shall verify a pure private automatic on-demand call without floor control and MCPTT users in the same MCPTT system as defined in clause 10.7.2.2.1 in ETSI TS 123 179 [2]. Specific procedures for private calls without floor control are defined in clause 11.1.2 in ETSI TS 124 379 [4].

More specifically, when the MCPTT user wants to make an on-demand private call without floor control, the MCPTT client shall follow the procedures in clause 11.1.1.2.1.1 (those shown in clause 7.2.15) but not including any Implicit floor control mechanism and removing the media-level section for the media floor control entity.

Message Sequence Diagram

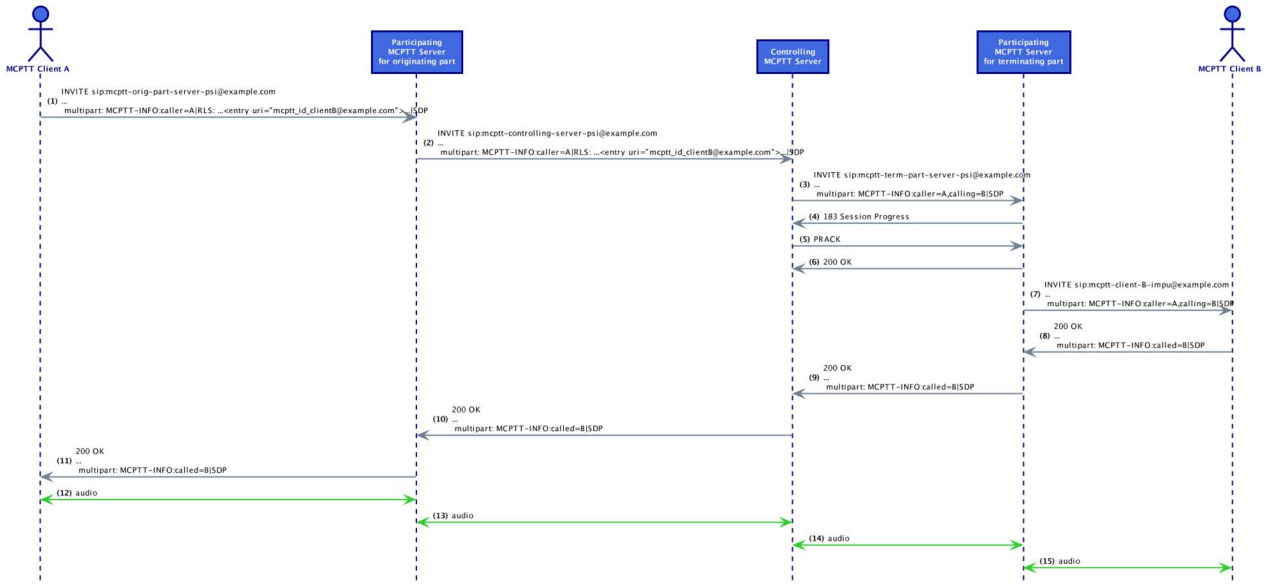

Figure 28: CONN/PRIV/AUTO/ONDEM/WOFC/01 Message Sequence

Message Details

```
[1] INVITE MCPTT Caller/UE --> MCPTT Participating

INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
 Via: SIP/2.0/UDP IP:PORT;branch=BRANCH
 From: <sip:mcptt-client-A-impu@example.com>;tag=TAG
 To: <sip:mcptt-server-orig-part-psi@example.com>
 Contact: <sip:mcptt-client-A-impu@IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-
service.ims.icsi.mcptt";+g.3gpp.mcptt
 ...
 Accept-Contact: *;+g.3gpp.mcptt;require;explicit
 Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
 P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
 [Privacy: id]
 P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
 Answer-Mode: Auto
 Content-Type: multipart/mixed; boundary=[boundary]

 --[boundary]
 Content-Type: application/vnd.3gpp.mcptt-info+xml

 <?xml version="1.0" encoding="UTF-8"?>
 <mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
   <mcptt-Params>
     <session-type>private</session-type>
   </mcptt-Params>
 </mcpttinfo>

 --[boundary]
 Content-Type: application/resource-lists+xml

 <?xml version="1.0" encoding="UTF-8"?>
 <resource-lists xmlns="urn:ietf:params:xml:ns:resource-lists"
xmlns:cc="urn:ietf:params:xml:ns:copycontrol">
   <list>
     <entry uri="sip:mcptt_id_clientB@example.com" cc:copyControl="to"/>
   </list>
 </resource-lists>

 --[boundary]
 Content-Type: application/sdp

v=0
o=MCPTTCLIENT 1183811731 4248272445 IN IP4 IP
s=-
c=IN IP4 IP
```

```
t=0 0
m=audio PORT RTP/AVP 105
a=label:1
i=speech
a=rtpmap:105 AMR-WB/16000/1
a=fmtp:105 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
a=ptime:20
a=maxptime:240
==> NOTE: REMOVED LINES
-- m=application 1234 udp MCPTT
-- a=fmtp:MCPTT mc_queing;mc_priority=5;mc_granted;mc_implicit_request
=======================================================
 ...

 --[boundary]
```

Interoperability Test Description

Table 28: CONN/PRIV/AUTO/ONDEM/WOFC/01

Interoperability Test Description			
Identifier	CONN/PRIV/AUTO/ONDEM/WOFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a private call without floor control with automatic commencement mode		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) calls User 2 (mcptt_id_clientB@example.com)
	2	check	Dialog creating INVITE received at the MCPTT participating server of User 1
	3	check	The participating server adapts the mcptt-info accordingly and creates an INVITE to the controlling server
	4	check	The controlling server check permissions and forward the INVITE to the participating server of the callee
	5	check	Upon arrival of the INVITE adapted by the terminating participating function at User 2 the call is automatically taken
	6	verify	Call connected and bidirectional media flows exchanged

7.2.20 MCPTT User initiates an on-demand private MCPTT call in manual commencement model without floor control [CONN/PRIV/MANUAL/ONDEM/WOFC/01]

Equivalent test to that in clause 7.2.16 but with no media-level section for the media floor control entity in the exchanged SDPs.

Message Sequence Diagram: check figure 25.

Message Details

Check clause 7.2.16 but with a SDP with no m=application XXXX udp MCPTT media floor control entity.

Interoperability Test Description

Table 29: CONN/PRIV/MANUAL/ONDEM/WOFC/01

Interoperability Test Description			
Identifier	CONN/PRIV/MANUAL/ONDEM/WOFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a private call without floor control with manual commencement mode		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) calls User 2 (mcptt_id_clientB@example.com)
	2	check	Dialog creating INVITE received at the MCPTT participating server of User 1
	3	check	The participating server adapts the mcptt-info accordingly and creates an INVITE to the controlling server
	4	check	The controlling server check permissions and forward the INVITE to the participating server of the callee
	5	check	Upon arrival of the INVITE adapted by the terminating participating function to the terminating Client User 2 is notified
	6	check	User 2 accepts the private call and all the signalling is completed
	7	verify	Call connected and simultaneous bidirectional media flows exchanged

7.2.21 MCPTT User initiates a pre-established private MCPTT call in automatic commencement model without floor control [CONN/PRIV/AUTO/PRE/WOFC/01]

Equivalent test to that in clause 7.2.17 but with no media-level section for the media floor control entity in the exchanged SDPs.

Message Sequence Diagram: check figure 26.

Message Details

Check clause 7.2.17 but with a SDP with no m=application XXXX udp MCPTT media floor control entity.

Interoperability Test Description

Table 30: CONN/PRIV/AUTO/PRE/WOFC/01

Interoperability Test Description			
Identifier	CONN/PRIV/AUTO/PRE/WOFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a private call without floor control with automatic commencement mode using pre-established sessions		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	The MCPTT clients of User 1 (mcptt_id_clientA@example.com) and User 2 (mcptt_id_clientB@example.com) pre-establish their respective session to the proper participating
	2	check	Sessions pre-established
	3	stimulus	User 1 calls User 2 using pre-established session
	4	check	REFER sent to the participating of User 1
	5	check	The participating server creates the proper INVITE with the data embedded in the REFER and forwards it to the controlling
	6	check	The controlling server forwards the INVITE to the participating server of the callee and sends a 200 ok back to the participating of the caller
	7	check	The participating of the caller notifies him/her using MCPC Connect message
	8	check	Similarly Client User 2 is notified with MCPC Connect and Call automatically accepted
	9	verify	Call connected and simultaneous bidirectional media flows exchanged

7.2.22 MCPTT User initiates a pre-established private MCPTT call in manual commencement model without floor control [CONN/ONN/PRIV/MANUAL/ONDEM/WOFC/01]

Equivalent test to that in clause 7.2.18 but with no media-level section for the media floor control entity in the exchanged SDPs.

Message Sequence Diagram: check figure 27.

Message Details

Check clause 7.2.18 but with a SDP with no m=application XXXX udp MCPTT media floor control entity.

Interoperability Test Description

Table 31: CONN/ONN/PRIV/MANUAL/ONDEM/WOFC/01

Interoperability Test Description			
Identifier	CONN/ONN/PRIV/MANUAL/ONDEM/WOFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a private call without floor control with manual commencement mode using pre-established sessions		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	The MCPTT clients of User 1 (mcptt_id_clientA@example.com) and User 2 (mcptt_id_clientB@example.com) pre-establish their respective session to the proper participating
	2	check	Sessions pre-established
	3	stimulus	User 1 calls User 2 using pre-established session
	4	check	REFER sent to the participating of User 1
	5	check	The participating server creates the proper INVITE with the data embedded in the REFER and forwards it to the controlling
	6	check	The controlling server forwards the INVITE to the participating server of the callee and sends a 200 ok back to the participating of the caller
	7	check	The participating of the caller notifies him/her by sending a (re)INVITE with the SDP of the callee
	8	check	User 2 answers the call and MCPC Connect messages are triggered by both participating servers
	9	verify	Call connected and simultaneous bidirectional media flows exchanged

7.3 Floor Controlling (FC)

7.3.1 Basic FC functionality [FC/BASIC/01]

This test shall verify the basic Floor Controlling functionality as defined by ETSI TS 124 380 [5]. In order to do so, after a successful establishment of a prearranged on-demand Group Call different users shall request the Token and Floor Control server capabilities on the controlling server shall be tested. For the test it is assumed that no Implicit Floor Control request has been included or that the token has been released previously, so that "Floor idle" state is considered as pre-condition.

Note that since MCPTT Floor Control protocol uses binary RTCP-based signalling, in the sequence diagram and message details the decoded meaning of (some of) the selected values for different meaning fields are displayed.

Message Sequence Diagram

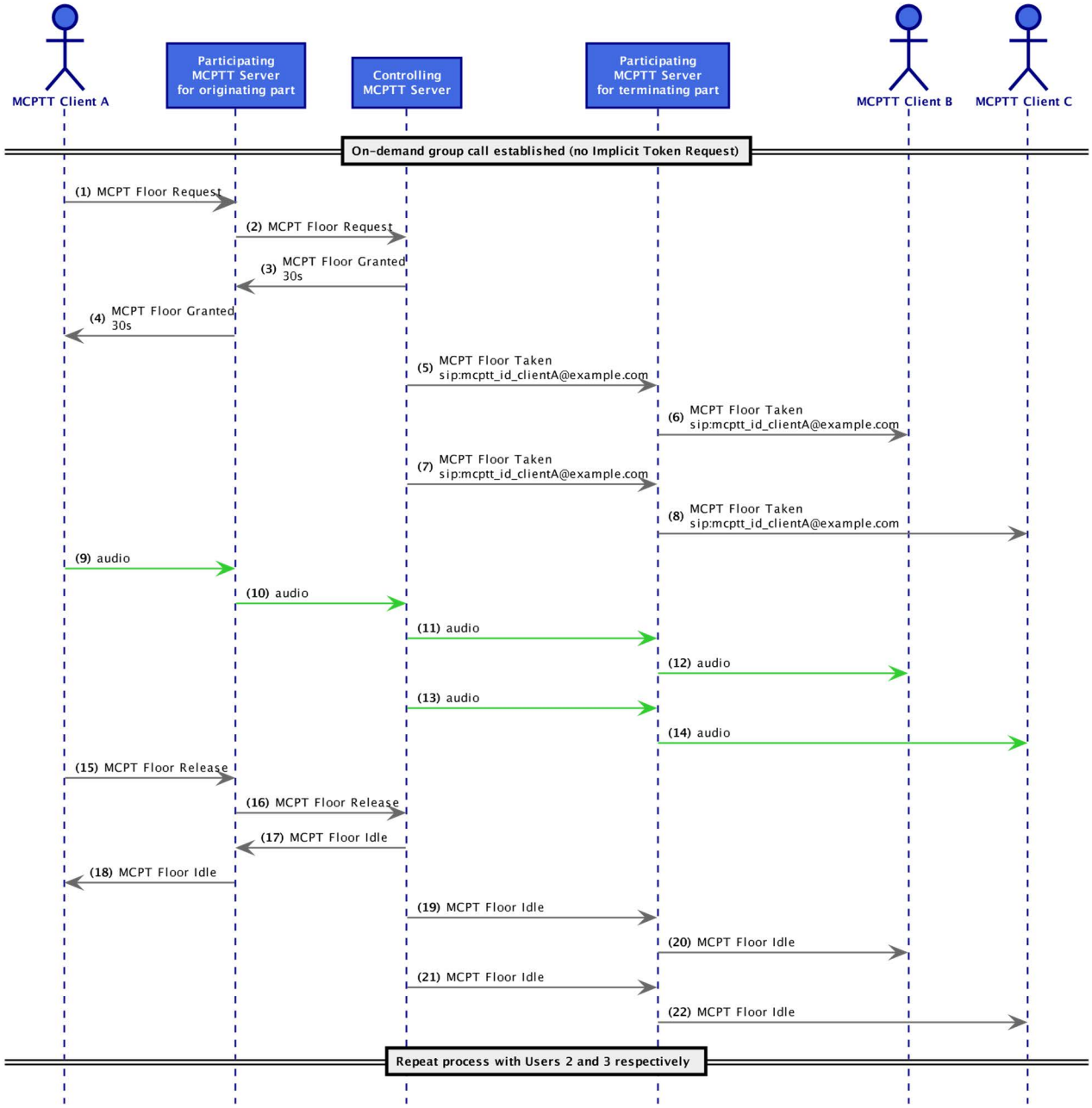

Figure 29: FC/BASIC/01 Message Sequence

Message Details

```
[1] MCPT Floor Request Caller/UE --> MCPTT Participating

Real-time Transport Control Protocol (Application specific)
    Subtype: 0
    Packet type: Application specific (204)
    Name (ASCII): MCPT
    Mission Critical Push-to-talk: Floor control
        ...0 .... = ACK Requirement: ACK not required (0)
        .... 0000 = Message type: Floor Request (0)
        Floor Priority: 5
        Floor Indicator: 0x8000
            1... .... .... .... = Normal: 1
            .0.. .... .... .... = Broadcast Group: 0
            ..0. .... .... .... = System: 0
            ...0 .... .... .... = Emergency: 0
            .... 0... .... .... = Imminent Peril: 0
```

```
[3] MCPT Floor Taken MCPTT Controlling --> MCPTT Participating

Real-time Transport Control Protocol (Application specific)
    Subtype: 2
    Packet type: Application specific (204)
    Name (ASCII): MCPT
    Mission Critical Push-to-talk: Floor control
        ...0 .... = ACK Requirement: ACK not required (0)
        .... 0010 = Message type: Floor Taken (2)
        Granted Party's Identity: sip:mcptt_id_clientA@example.com
        Permission to Request the Floor: True
        Sequence Number: 1
        Floor Indicator: 0x8000
            1... .... .... .... = Normal: 1
            .0.. .... .... .... = Broadcast Group: 0
            ..0. .... .... .... = System: 0
            ...0 .... .... .... = Emergency: 0
            .... 0... .... .... = Imminent Peril: 0

[5] MCPT Floor Granted MCPTT Controlling --> MCPTT Participating

Real-time Transport Control Protocol (Application specific)
    Subtype: 1
    Packet type: Application specific (204)
    Name (ASCII): MCPT
    Mission Critical Push-to-talk: Floor control
        ...0 .... = ACK Requirement: ACK not required (0)
        .... 0001 = Message type: Floor Granted (1)
        Duration (s): 30
        Floor Priority: 5
        Floor Indicator: 0x8000
            1... .... .... .... = Normal: 1
            .0.. .... .... .... = Broadcast Group: 0
            ..0. .... .... .... = System: 0
            ...0 .... .... .... = Emergency: 0
            .... 0... .... .... = Imminent Peril: 0
```

Interoperability Test Description

Table 32: FC/BASIC/01

Interoperability Test Description			
Identifier	FC/BASIC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and MCPTT Floor Controlling capabilities in Clients and controlling		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • UEs properly registered to the SIP core/IMS and MCPTT system • On-demand pre-arranged Group Call properly established and in • Floor-Idle state		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) pushes the PTT button
	2	check	RTCP App based MCPT Floor Request is sent to the participating
	3	check	Floor Request sent to the controlling
	4	check	Floor Granted (30s) sent back to User 1 and Floor Taken sent to Users 2 and 3
	5	verify	Uni-directional flow from User 1 to Users 2 and 3
	6	stimulus	User 1 releases the PTT button
	7	check	RTCP App based MCPT Floor Release is sent to the participating
	8	check	Floor Release sent to the controlling
	9	check	Floor Idle sent back to Users 1, 2 and 3
	10	verify	Floor available for further request

7.3.2 Basic FC functionality. Effect of Priorities. [FC/BASIC/02]

This test case extends the previous basic on in clause 7.3.1 by showing the preemptiveness capabilities in the Floor Control when a user with higher priority requests the Token already granted to another lower-priority one. In fact as defined in clause 4.1.1.2 in ETSI TS 124 380 [5] whenever a new request with higher priority than the ongoing talk burst arrives, the floor control server revokes the current talk burst by sending a Floor Revoke message to the current talker. The current talker is interrupted and the current media burst is ended by the current floor participant by sending a Floor Release message. Then the floor control server sends a Floor Granted message to the revoking user and send Floor Taken message to other group members.

Therefore, the example in clause A.3.5 of ETSI TS 124 380 [5] will be followed. Note that, although the whole annex A is informative (not normative), it is referenced here in order to better illustrate the test case. Similarly clauses A.3.3 to A.3.4 show other examples of "advanced" floor controlling mechanisms. However, these examples are not considered in the present document. Note that the max floor priority that can be requested in a Floor Request message is negotiated between the MCPTT client and the controlling MCPTT function using the "mc_priority" fmtp parameter. In the following sequence diagrams and messages it is assumed values 5 and 10 are compatible with the negotiated maximum value.

Message Sequence Diagram

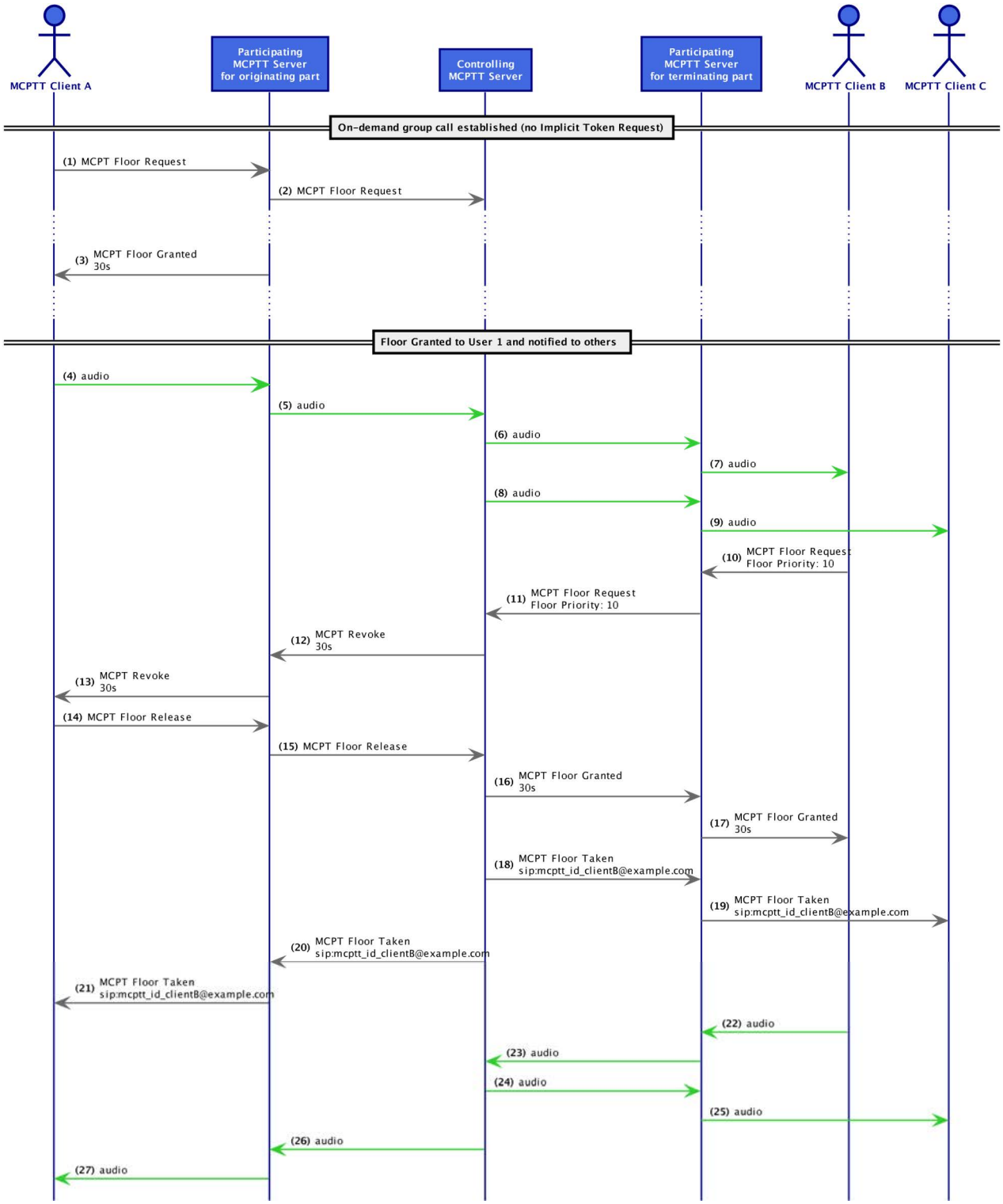

Figure 30: FC/BASIC/02 Message Sequence

Message Details

```
[10] MCPT Floor Request Caller/UE --> MCPTT Participating

Real-time Transport Control Protocol (Application specific)
    Subtype: 0
    Packet type: Application specific (204)
    Name (ASCII): MCPT
    Mission Critical Push-to-talk: Floor control
```

```
        ...0 .... = ACK Requirement: ACK not required (0)
        .... 0000 = Message type: Floor Request (0)
        Floor Priority: 10
        Floor Indicator: 0x8000
            1... .... .... .... = Normal: 1
            .0.. .... .... .... = Broadcast Group: 0
            ..0. .... .... .... = System: 0
            ...0 .... .... .... = Emergency: 0
            .... 0... .... .... = Imminent Peril: 0

[12] MCPT Floor Revoke MCPTT Controlling --> MCPTT Participating

Real-time Transport Control Protocol (Application specific)
    Subtype: 2
    Packet type: Application specific (204)
    Name (ASCII): MCPT
    Mission Critical Push-to-talk: Floor control
        ...0 .... = ACK Requirement: ACK not required (0)
        .... 0010 = Message type: Floor Revoke (6)
    Revoke Cause: Media Burst pre-empted (4)
    Revoke Phrase: Media Burst pre-empted
```

Interoperability Test Description

Table 33: FC/BASIC/02

Interoperability Test Description			
Identifier	FC/BASIC/02		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and MCPTT Floor Controlling capabilities in Clients and controlling. Effect of priorities will be checked.		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MCLTE-1 only), MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only), (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • UEs properly registered to the SIP core/IMS and MCPTT system • On-demand pre-arranged Group Call properly established and User 1 has been granted the token		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 2 (mcptt_id_clientb@example.com) with higher priority pushes the PTT button
	2	check	Floor Request is sent to the participating
	3	check	Floor Request sent to the controlling
	4	check	Floor Revoked sent to User 1 which Releases the token explicitly
	5	check	Floor Granted sent to User 2 and Floor Taken sent to Users 1 and 3
	6	verify	Uni-directional flow from User 2 to Users 1 and 3

7.4 Registration and Service Authorization (RegAuth)

7.4.1 MCPTT User authenticates to the IdMS [REGAUTH/IDMSAUTH/01]

MCPTT User gets authenticated in the IdMS using OpenID Connect Core 1.0 as specified in ETSI TS 124 482 [7]. Web-based user and password mechanism shall be used so that the MCPTT Client receives the access and identity tokens that shall be later used for all the service authorization mechanisms.

Message Sequence Diagram

Figure 31: REGAUTH/IDMSAUTH/01 Message Sequence

Message Details

```
[1] OpenID AuthReq MCPTT Client --> IdMS

GET /URL/authorize?acr_values=3gpp%3Aacr%3Apassword&code_challenge=XGCy7NHC9hndd_TiiSBLo4QZa-
G1lvrHghUsh8dSwdo&client_id=mcptt_client&state=h2xxOC0gFfJOZvj5&redirect_uri=http%3A%2F%2Fhttpbin.or
g%2Fget&response_type=code&code_challenge_method=S256&scope=openid+3gpp%3Amcptt%3Aptt_server+3gpp%3A
mcptt%3Aconfig_management_server HTTP/1.1
....
Connection: keep-alive
Upgrade-Insecure-Requests: 1

[2]  IdMS --> MCPTT Client

HTTP/1.1 302 Found
Set-Cookie: JSESSIONID=mw5e....r4ww2jx;Path=/URL
X-Frame-Options: DENY
Location: http://proxyoridmswebserver:8080/URL/login
Content-Length: 0

[5] MCPTT Client --> IdMS

POST /URL/token HTTP/1.1
Connection: keep-alive
Accept-Encoding: gzip, deflate
Accept: */*
Content-Type: application/x-www-form-urlencoded
...

code=5pSsvN&code_verifier=XjtFDTFt1b6ye5CU&state=h2xxOC0gFfJOZvj5&redirect_uri=http%3A%2F%2Fhttpbin.
org%2Fget&client_id=mcptt_client&grant_type=authorization_code
```

```
[6] IdMS --> MCPTT Client

HTTP/1.1 200 OK
Access-Control-Allow-Origin: *
Content-Type: application/json;charset=UTF-8
Transfer-Encoding: chunked

6EB
{"access_token":"eyJra....FzthA","token_type":"Bearer","refresh_token":"eyJhb....ODI2NC02Y2Y4LTRhOTg
tOWRhMC00MWNkNzJmYmE2N2IifQ.","expires_in":3599,"scope":"3gpp:mcptt:ptt_server openid
3gpp:mcptt:config_management_server","id_token":"eyJra....h_SxV3ak4zk2FYLWHdwvA_MtaxoNw"
    1
}
0
```

Interoperability Test Description

Table 34: REGAUTH/IDMSAUTH/01

Interoperability Test Description			
Identifier	REGAUTH/IDMSAUTH/01		
Test Objective	Verify IP connectivity, proper access from the MCPTT Client to the IdMS and successful authentication mechanism		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• OpenID Connect Core 1.0 (see ETSI TS 124 482 [7])		
Applicability	• MCPTT-Client_IDMS		
Pre-test conditions	• IP connectivity among all elements of the specific scenario, access to the IdMS via the proper APN and tunnelling mechanism -if any-		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 either using CMS URL or hardcoded ones access the IdMS
	2	check	Initial Authentication Request
	3	check	User properly authenticate using web based user & password
	4	check	User requests all the token associated to the relevant scopes
	5	verify	User 1 correctly authenticated and data and identity tokens correctly received

7.4.2 MCPTT User gets registered and authorized using third-party registration [REGAUTH/3PRTYREG/REGISTER/01]

Assuming an IMS Core, the MCPTT Client registers and the S-CSCF sends a third-party registration. In this test case and associated diagram and message details it is assumed that the MCPTT User has previously authenticated with the IdMS and got the mcptt_id and needed Access Token, so that it would be included in the mcptt-info body in the original REGISTER (see clauses 7.2.1 and 7.3.2 in ETSI TS 124 379 [4]). If this is not the case, the 3rd party register shall not be used for Service Authorization and later PUBLISH including not only poc-settings but also needed credentials shall be mandatory.

Message Sequence Diagram

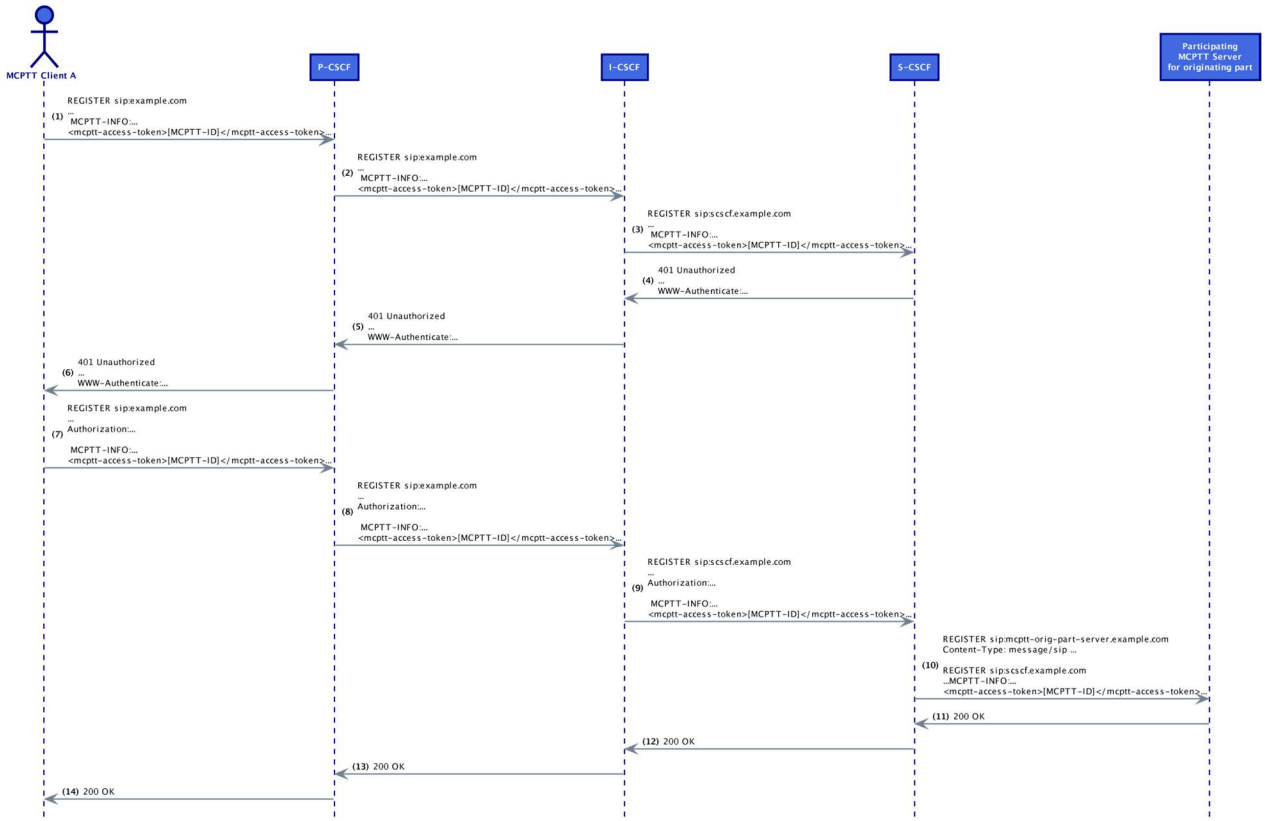

Figure 32: REGAUTH/3PRTYREG/REGISTER/01 Message Sequence

Message Details

```
[1] UE --> P-CSCF

REGISTER sip:example.com SIP/2.0
Via: SIP/2.0/UDP IP:PORT;branch=BRANCH
From: <sip:mcptt-client-A-impu@example.com>;tag=TAG
To: <sip:mcptt-client-A-impu@example.com>
Contact: sip:mcptt-client-A-impu@IP:PORT;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-
service.ims.icsi.mcptt";+g.3gpp.mcptt
...
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0">
  <mcptt-Params>
    <mcptt-access-token type="Normal">
      <mcpttString>eyJhbGciOiJIUzI5c...stripped...u5CSpyHI</mcpttString>
    </mcptt-access-token>
    <mcptt-client-id type="Normal">
      <mcpttString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttString>
    </mcptt-client-id>
  </mcptt-Params>
</mcpttinfo>
```

```
[10] S-CSCF --> MCPTT Participating

REGISTER sip:mcptt-orig-part-server.example.com SIP/2.0
Via: SIP/2.0/UDP 51.254.109.162:6060;branch=BRANCH
To: <sip:mcptt-client-A-impu@example.com>
From: <sip:scscf.example.com>;tag=TAG
Event: registration
Contact: <sip:scscf.example.com:6060>
...
Content-Type: message/sip

REGISTER sip:scscf.example.com SIP/2.0
Via: SIP/2.0/UDP IP:PORT;branch=BRANCH
From: <sip:mcptt-client-A-impu@example.com>;tag=TAG
To: <sip:mcptt-client-A-impu@example.com>
Contact: sip:mcptt-client-A-impu@IP:PORT;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-
service.ims.icsi.mcptt";+g.3gpp.mcptt
...
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0">
  <mcptt-Params>
    <mcptt-access-token type="Normal">
      <mcpttString>eyJhbGciOiJIUzI5c...stripped...u5CSpyHI</mcpttString>
    </mcptt-access-token>
    <mcptt-client-id type="Normal">
      <mcpttString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttString>
    </mcptt-client-id>
  </mcptt-Params>
</mcpttinfo>
```

Interoperability Test Description

Table 35: REGAUTH/3PRTYREG/REGISTER/01

Interoperability Test Description			
Identifier	REGAUTH/3PRTYREG/REGISTER/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing and 3rd party registration to the MCPTT Participating		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_REGAUTH • IMS_3RDPARTYREGISTER		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • Client previously authenticated in the IdMS -or the Identity and Access Token have been received by other mean-		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) registers with its IMPU and MCPTT specific info mcptt-info
	2	check	REGISTER sent to the P-CSCF with mcptt-info body
	3	check	REGISTER sent to the S-CSCF
	4	check	S-CSCF creates a 3rd Party Register towards the participating and embeds the original REGISTER as body
	5	verify	User 1 correctly registered to the IMS Core and MCPTT participating. IMPU vs. mcptt_id binding and service authorization completed.

7.4.3 MCPTT User gets authorized using PUBLISH mechanism [REGAUTH/PUBLISH/REGISTER/01]

If the User was not authenticated with the IdMS prior to the IMS REGISTER, it shall submit later the MCPTT User credentials for proper Service Authorization and binding between IMPU and mcptt_id. Following clause 7.3.3 in ETSI TS 124 379 [4] the MCPTT server shall support obtaining service authorization specific information from a SIP PUBLISH request for both MCPTT server settings (using an Event header field set to the "poc-settings" and an application/poc-settings+xml MIME body) and Service Authorization by an additional application/vnd.3gpp.mcptt-info+xml MIME body containing an <mcptt-access-token> element and an <mcptt-client-id> element.

Message Sequence Diagram

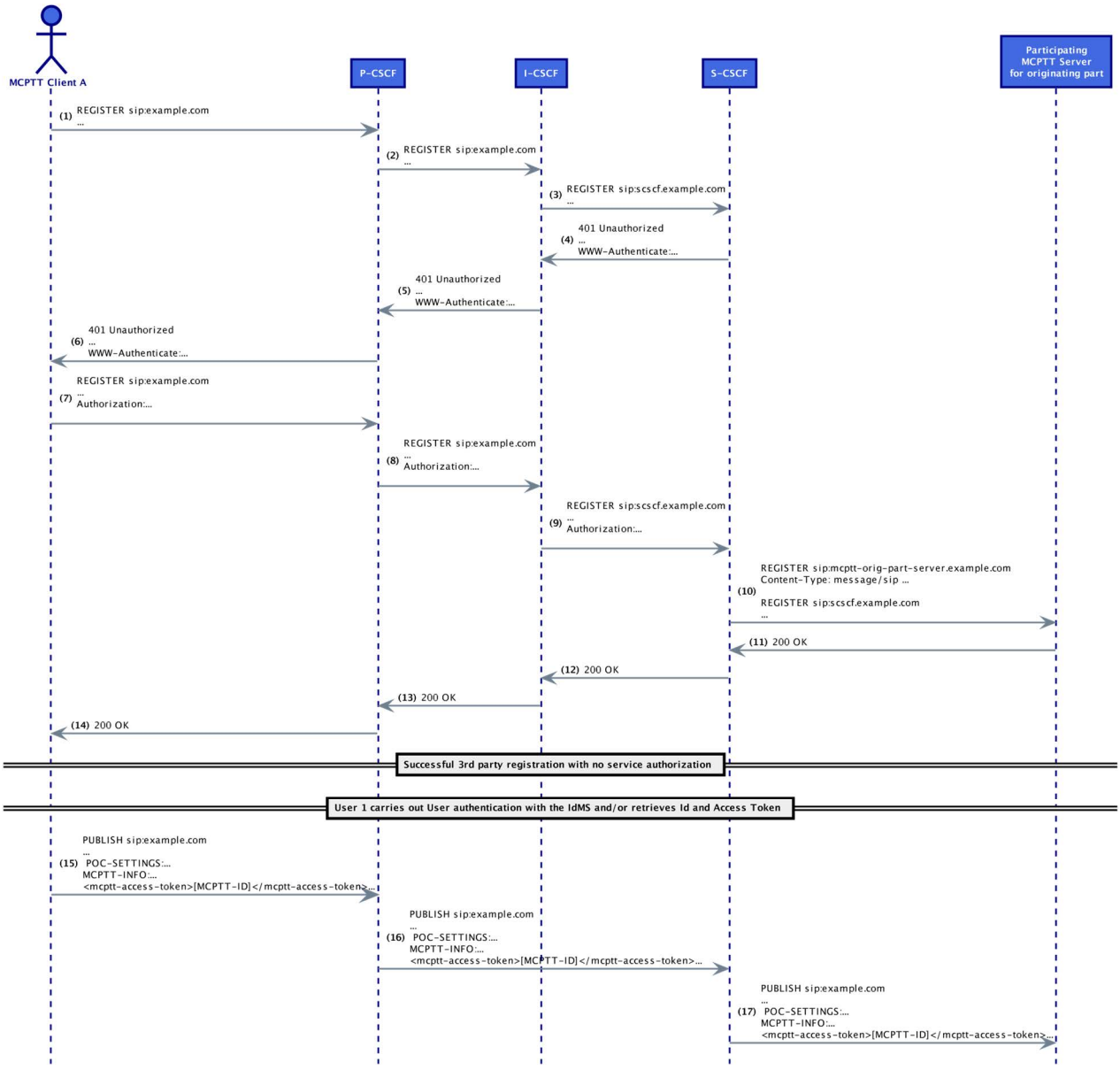

Figure 33: REGAUTH/PUBLISH/REGISTER/01 Message Sequence

Message Details

```
[1] UE --> P-CSCF

REGISTER sip:example.com SIP/2.0
Via: SIP/2.0/UDP IP:PORT;branch=BRANCH
From: <sip:mcptt-client-A-impu@example.com>;tag=TAG
To: <sip:mcptt-client-A-impu@example.com>
```

```
Contact: sip:mcptt-client-A-impu@IP:PORT;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-
service.ims.icsi.mcptt";+g.3gpp.mcptt
...

[10] S-CSCF --> MCPTT Participating

REGISTER sip:mcptt-orig-part-server.example.com SIP/2.0
Via: SIP/2.0/UDP 51.254.109.162:6060;branch=BRANCH
To: <sip:mcptt-client-A-impu@example.com>
From: <sip:scscf.example.com>;tag=TAG
Event: registration
Contact: <sip:scscf.example.com:6060>
...
Content-Type: message/sip

REGISTER sip:scscf.example.com SIP/2.0
Via: SIP/2.0/UDP IP:PORT;branch=BRANCH
From: <sip:mcptt-client-A-impu@example.com>;tag=TAG
To: <sip:mcptt-client-A-impu@example.com>
Contact: sip:mcptt-client-A-impu@IP:PORT;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-
service.ims.icsi.mcptt";+g.3gpp.mcptt
...

[15] UE --> P-CSCF

PUBLISH sip:mcptt-orig-part-server.example.com SIP/2.0
...
Content-Type: multipart/mixed; boundary=[boundary]

--[boundary]
Content-Type: application/poc-settings+xml
...

--[boundary]
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0">
  <mcptt-Params>
    <mcptt-access-token type="Normal">
      <mcpttString>eyJhbGciOiJIUzI5c...stripped...u5CSpyHI</mcpttString>
    </mcptt-access-token>
    <mcptt-client-id type="Normal">
      <mcpttString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttString>
    </mcptt-client-id>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
```

Interoperability Test Description

Table 36: REGAUTH/PUBLISH/REGISTER/01

Interoperability Test Description			
Identifier	REGAUTH/PUBLISH/REGISTER/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, 3rd party registration to the MCPTT Participating and SIP PUBLISH based service authorization mechanism		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_PUBAUTH • IMS_3RDPARTYREGISTER		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • Proper configuration of PCC related Functional elements (P-CSCF and PCRF)		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) registers with its IMPU
	2	check	REGISTER sent to the P-CSCF without mcptt-info body
	3	check	REGISTER sent to the S-CSCF
	4	check	S-CSCF creates a 3rd Party Register towards the participating and embeds the original REGISTER as body
	5	check	Upon successful user authentication to the IdMS the Client sends a PUBLISH including poc-settings and mcptt_info with the credentials
	6	verify	User 1 correctly registered to the IMS Core and MCPTT participating. IMPU vs. mcptt_id binding and service authorization completed.

7.5 Policing (PCC)

7.5.1 Setup of an Unicast MC Bearer by SIP Core/IMS [PCC/BEARERSETUP/01]

A SIP/Core IMS compatible with MCPTT specific RX interface definition shall be able to signal required QoS . The overall procedure is defined in clauses 5.2.9.3, 9.2.2.3.1, 9.2.2.3.2, 10.11.2 and 10.11.3 in Stage 2 [2].

In order to evaluate the interface an on-demand private call will be used.

Message Sequence Diagram

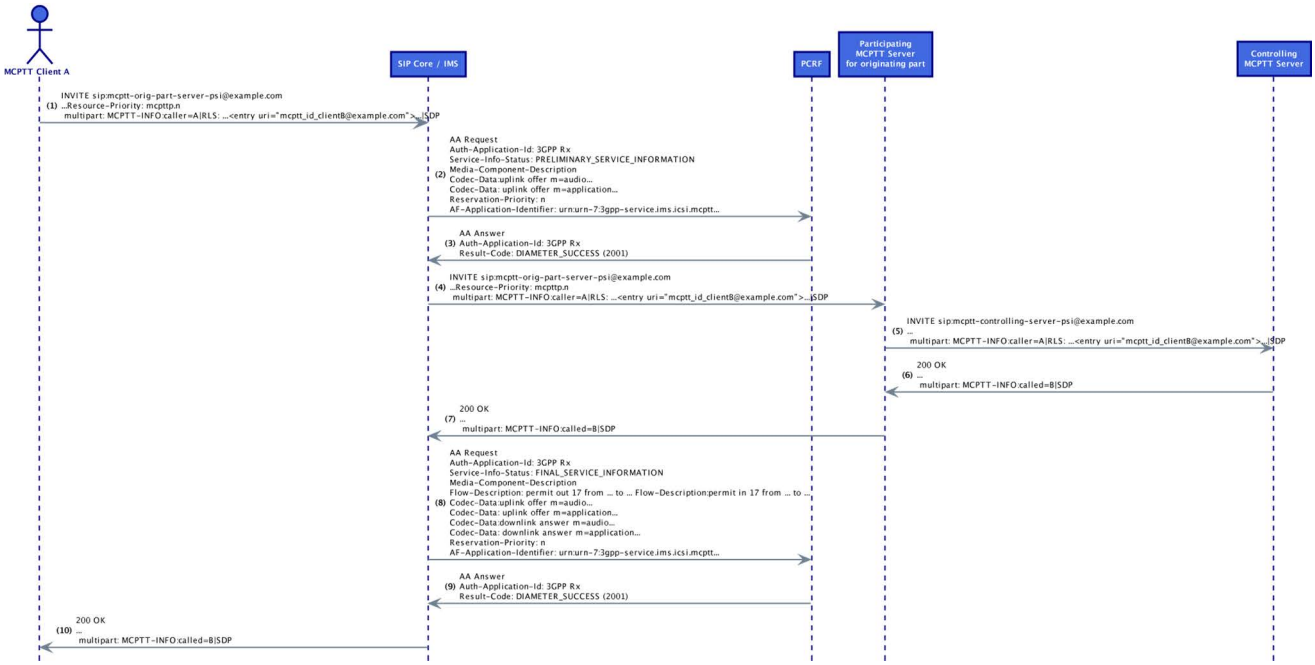

Figure 34: PCC/BEARERSETUP/01 Message Sequence

Message Details

```
[1] INVITE MCPTT Caller/UE --> SIP Core/IMS

INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
 Via: SIP/2.0/UDP IP:PORT;branch=BRANCH
 From: <sip:mcptt-client-A-impu@example.com>;tag=TAG
 To: <sip:mcptt-server-orig-part-psi@example.com>
 Contact: <sip:mcptt-client-A-impu@IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-
service.ims.icsi.mcptt";+g.3gpp.mcptt
 ...
 Accept-Contact: *;+g.3gpp.mcptt;require;explicit
 Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
 P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
 [Privacy: id]
 P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
 Answer-Mode: Auto
 Content-Type: multipart/mixed; boundary=[boundary]
 Resource-Priority: mcpttp.5

 --[boundary]
 Content-Type: application/vnd.3gpp.mcptt-info+xml

 <?xml version="1.0" encoding="UTF-8"?>
 <mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
   <mcptt-Params>
     <session-type>private</session-type>
   </mcptt-Params>
 </mcpttinfo>

 --[boundary]
 Content-Type: application/resource-lists+xml

 <?xml version="1.0" encoding="UTF-8"?>
 <resource-lists xmlns="urn:ietf:params:xml:ns:resource-lists"
xmlns:cc="urn:ietf:params:xml:ns:copycontrol">
   <list>
     <entry uri="sip:mcptt_id_clientB@example.com" cc:copyControl="to"/>
   </list>
 </resource-lists>

 --[boundary]
 Content-Type: application/sdp
```

```
 ...

 --[boundary]--

[2] AA-Request SIP Core/IMS --> PCRF

AA-Request

Auth-Application-Id: 3GPP Rx (16777236)
Service-Info-Status: PRELIMINARY_SERVICE_INFORMATION (1)
Media-Component-Description
  Media-Component-Number: 1
  Media-Sub-Component:
    Flow-Number: 1
    Flow-Status: ENABLED (2)
    Flow-Usage: NO_INFORMATION (0)
  Media-Sub-Component:
    Flow-Number: 2
    Flow-Status: ENABLED (2)
    Flow-Usage: RTCP (1)
  Codec-Data: uplink offer m=audio...
  Media-Type: AUDIO (0)
Media-Component-Description
  Media-Component-Number: 2
  Media-Sub-Component:
    Flow-Number: 1
    Flow-Status: ENABLED (2)
    Flow-Usage: NO_INFORMATION (0)
  Codec-Data: uplink offer m=application...
  Media-Type: APPLICATION (3)
Rx-Request-Type: INITIAL_REQUEST (0)
MCPTT-Identifier: mcpttp
Reservation-Priority: PRIORITY-FIVE (5)
AF-Application-Identifier: urn:urn-7:3gpp-service.ims.icsi.mcptt
...


[8] AA-Request SIP Core/IMS --> PCRF

AA-Request

Auth-Application-Id: 3GPP Rx (16777236)
Service-Info-Status: FINAL_SERVICE_INFORMATION (0)
Media-Component-Description
  Media-Component-Number: 1
  Media-Sub-Component:
    Flow-Number: 1
    Flow-Status: ENABLED (2)
    Flow-Description: permit out 17 from ... to ...
    Flow-Description: permit in 17 from ... to ...
    Flow-Usage: NO_INFORMATION (0)
  Media-Sub-Component:
    Flow-Number: 2
    Flow-Status: ENABLED (2)
    Flow-Description: permit out 17 from ... to ...
    Flow-Description: permit in 17 from ... to ...
    Flow-Usage: RTCP (1)
  Codec-Data: uplink offer m=audio...
  Codec-Data: downlink answer m=audio...
  Media-Type: AUDIO (0)
Media-Component-Description
  Media-Component-Number: 2
  Media-Sub-Component:
    Flow-Number: 1
    Flow-Status: ENABLED (2)
    Flow-Description: permit out 17 from ... to ...
    Flow-Description: permit in 17 from ... to ...
    Flow-Usage: NO_INFORMATION (0)
  Codec-Data: uplink offer m=application...
  Codec-Data: downlink answer m=application...
  Media-Type: APPLICATION (3)
Rx-Request-Type: INITIAL_REQUEST (0)
MCPTT-Identifier: mcpttp
Reservation-Priority: PRIORITY-FIVE (5)
AF-Application-Identifier: urn:urn-7:3gpp-service.ims.icsi.mcptt
...
```

Interoperability Test Description

Table 37: PCC/BEARERSETUP/01

Interoperability Test Description			
Identifier	PCC/BEARERSETUP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and IMS PCC mechanisms supporting MCPTT applications		
Configuration(s)	• CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6) • IMS_RX (clause 6.4)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) calls User 2 (mcptt_id_clientB@example.com)
	2	check	Dialog creating INVITE received at the P-CSCF
	3	check	The P-CSCF signals via DIAMETER the QoS requirement to the PCRF
	4	check	User 2 accepts the private call and all the signalling is completed
	5	verify	Call connected, unicast MC bearer established and media flows exchanged

7.5.2 Setup of an Unicast MC Bearer by MCPTT Participating AS [PCC/BEARERSETUP/02]

Equivalent to clause 7.5.1 but it is the Participating AS the responsible for interacting with the PCRF using the MCPTT-5 reference point (equivalent to RX interface).

Message Sequence Diagram

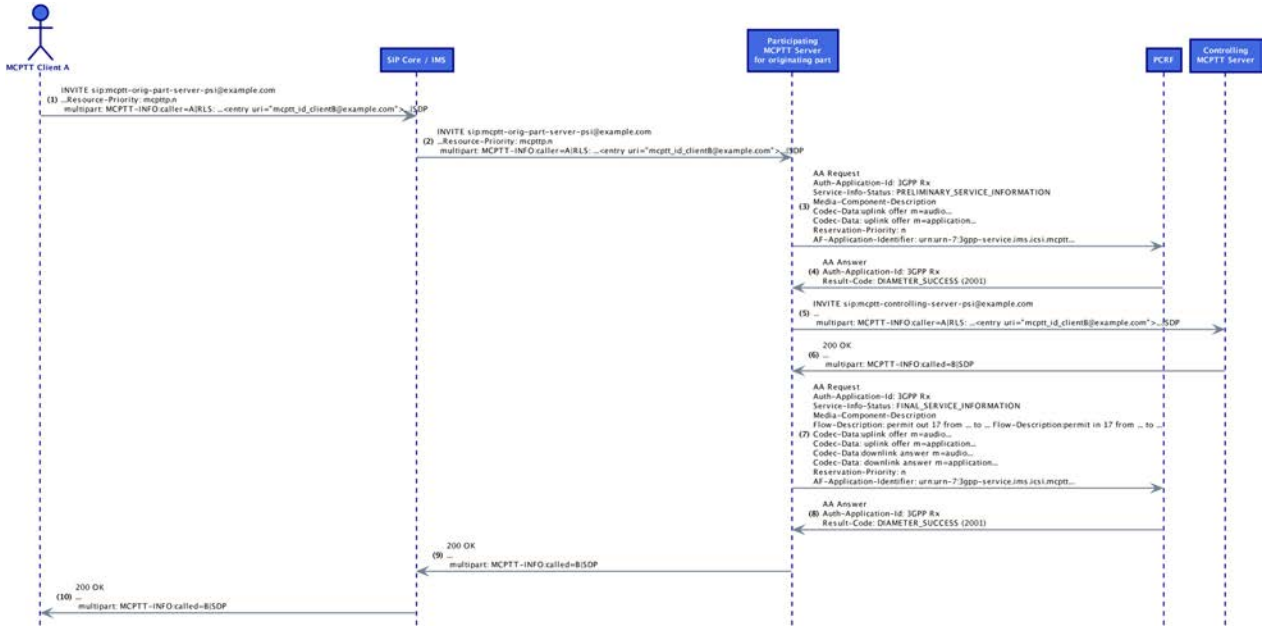

Figure 35: PCC/BEARERSETUP/02 Message Sequence

Message Details

```
[3] MCPTT Participating --> PCRF

AA-Request

Auth-Application-Id: 3GPP Rx (16777236)
Service-Info-Status: PRELIMINARY_SERVICE_INFORMATION (1)
Media-Component-Description
  Media-Component-Number: 1
  Media-Sub-Component:
    Flow-Number: 1
    Flow-Status: ENABLED (2)
    Flow-Usage: NO_INFORMATION (0)
  Media-Sub-Component:
    Flow-Number: 2
    Flow-Status: ENABLED (2)
    Flow-Usage: RTCP (1)
  Codec-Data: uplink offer m=audio...
  Media-Type: AUDIO (0)
Media-Component-Description
  Media-Component-Number: 2
  Media-Sub-Component:
    Flow-Number: 1
    Flow-Status: ENABLED (2)
    Flow-Usage: NO_INFORMATION (0)
  Codec-Data: uplink offer m=application...
  Media-Type: APPLICATION (3)
Rx-Request-Type: INITIAL_REQUEST (0)
MCPTT-Identifier: mcpttp
Reservation-Priority: PRIORITY-FIVE (5)
AF-Application-Identifier: urn:urn-7:3gpp-service.ims.icsi.mcptt
...


[7] MCPTT Participating --> PCRF

AA-Request

Auth-Application-Id: 3GPP Rx (16777236)
Service-Info-Status: FINAL_SERVICE_INFORMATION (0)
Media-Component-Description
  Media-Component-Number: 1
  Media-Sub-Component:
    Flow-Number: 1
```

```
    Flow-Status: ENABLED (2)
    Flow-Description: permit out 17 from ... to ...
    Flow-Description: permit in 17 from ... to ...
    Flow-Usage: NO_INFORMATION (0)
  Media-Sub-Component:
    Flow-Number: 2
    Flow-Status: ENABLED (2)
    Flow-Description: permit out 17 from ... to ...
    Flow-Description: permit in 17 from ... to ...
    Flow-Usage: RTCP (1)
  Codec-Data: uplink offer m=audio...
  Codec-Data: downlink answer m=audio...
  Media-Type: AUDIO (0)
Media-Component-Description
  Media-Component-Number: 2
  Media-Sub-Component:
    Flow-Number: 1
    Flow-Status: ENABLED (2)
    Flow-Description: permit out 17 from ... to ...
    Flow-Description: permit in 17 from ... to ...
    Flow-Usage: NO_INFORMATION (0)
  Codec-Data: uplink offer m=application...
  Codec-Data: downlink answer m=application...
  Media-Type: APPLICATION (3)
Rx-Request-Type: INITIAL_REQUEST (0)
MCPTT-Identifier: mcpttp
Reservation-Priority: PRIORITY-FIVE (5)
AF-Application-Identifier: urn:urn-7:3gpp-service.ims.icsi.mcptt
...
```

Interoperability Test Description

Table 38: PCC/BEARERSETUP/02

Interoperability Test Description			
Identifier	PCC/BEARERSETUP/02		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and MCPTT participating signalling MCPTT PCC applications		
Configuration(s)	• CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_RX, MCPTT-Part_MCPTT-FC (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) calls User 2 (mcptt_id_clientB@example.com)
	2	check	The call setup traverses the IMS Core without triggering any PCC mechanism
	3	check	Dialog creating INVITE received at the MCPTT participating server of User 1
	4	check	The participating signals via DIAMETER the QoS requirement to the PCRF
	5	check	User 2 accepts the private call and all the signalling is completed
	6	verify	Call connected, unicast MC bearer established and media flows exchanged

7.5.3 Update of an Unicast MC Bearer by SIP Core/IMS [PCC/BEARERUPDATE/01]

Upon a change in an on-going session characteristics (i.e. due to an upgrade to emergency or imminent-peril call) a SIP/Core IMS compatible with MCPTT specific RX interface definition shall be able to update the required QoS . In order to evaluate the interface an on-demand private call will be used.

Message Sequence Diagram

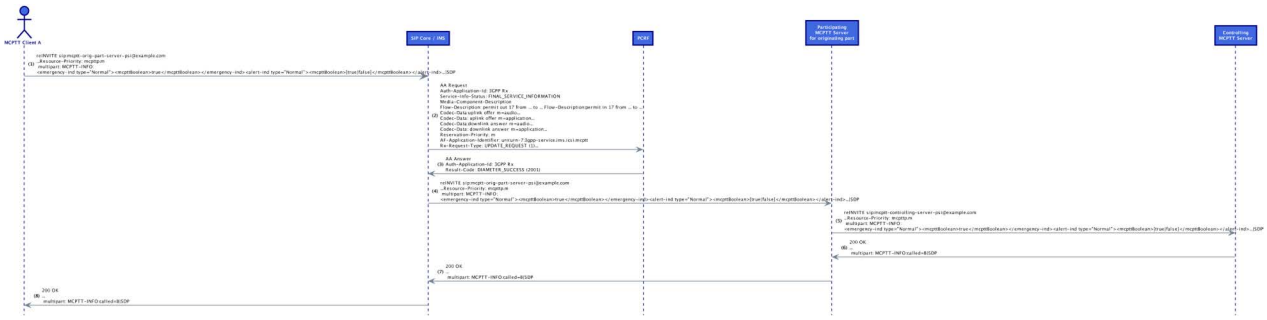

Figure 36: PCC/BEARERUPDATE/01 Message Sequence

Message Details

```
[1] INVITE MCPTT Caller/UE --> SIP Core/IMS

INVITE sip:mcptt-server-orig-part-psi@example.com SIP/2.0
 Via: SIP/2.0/UDP IP:PORT;branch=BRANCH
 From: <sip:mcptt-client-A-impu@example.com>;tag=TAG
 To: <sip:mcptt-server-orig-part-psi@example.com>
 Contact: <sip:mcptt-client-A-impu@IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-
service.ims.icsi.mcptt";+g.3gpp.mcptt
 ...
 Accept-Contact: *;+g.3gpp.mcptt;require;explicit
 Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
 P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
 [Privacy: id]
 P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
 Answer-Mode: Auto
 Content-Type: multipart/mixed; boundary=[boundary]
 Resource-Priority: mcpttp.10

 --[boundary]
 Content-Type: application/vnd.3gpp.mcptt-info+xml

 <?xml version="1.0" encoding="UTF-8"?>
 <mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
   <mcptt-Params>
     <session-type>private</session-type>
     <emergency-ind type="Normal">
        <mcpttBoolean>true</mcpttBoolean>
     </emergency-ind>
   </mcptt-Params>
 </mcpttinfo>

 --[boundary]
 Content-Type: application/sdp

 ...

 --[boundary]

[2] AA-Request SIP Core/IMS --> PCRF

AA-Request

Auth-Application-Id: 3GPP Rx (16777236)
Service-Info-Status: FINAL_SERVICE_INFORMATION (0)
Media-Component-Description
  Media-Component-Number: 1
```

```
  Media-Sub-Component:
    Flow-Number: 1
    Flow-Status: ENABLED (2)
    Flow-Description: permit out 17 from ... to ...
    Flow-Description: permit in 17 from ... to ...
    Flow-Usage: NO_INFORMATION (0)
  Media-Sub-Component:
    Flow-Number: 2
    Flow-Status: ENABLED (2)
    Flow-Description: permit out 17 from ... to ...
    Flow-Description: permit in 17 from ... to ...
    Flow-Usage: RTCP (1)
  Codec-Data: uplink offer m=audio...
  Codec-Data: downlink answer m=audio...
  Media-Type: AUDIO (0)
Media-Component-Description
  Media-Component-Number: 2
  Media-Sub-Component:
    Flow-Number: 1
    Flow-Status: ENABLED (2)
    Flow-Description: permit out 17 from ... to ...
    Flow-Description: permit in 17 from ... to ...
    Flow-Usage: NO_INFORMATION (0)
  Codec-Data: uplink offer m=application...
  Codec-Data: downlink answer m=application...
  Media-Type: APPLICATION (3)
Rx-Request-Type: UPDATE_REQUEST (1)
MCPTT-Identifier: mcpttp
Reservation-Priority: PRIORITY-TEN (10)
AF-Application-Identifier: urn:urn-7:3gpp-service.ims.icsi.mcptt
...
```

Interoperability Test Description

Table 39: PCC/BEARERUPDATE/01

Interoperability Test Description			
Identifier	PCC/BEARERUPDATE/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and IMS PCC mechanisms supporting MCPTT applications		
Configuration(s)	• CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6) • IMS_RX (clause 6.4)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system • Ongoing private call between User 1 and User 2 with certain bearer conditions		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	Change in the conditions of the ongoing call
	2	check	(re)INVITE received at the P-CSCF
	3	check	The P-CSCF signals via DIAMETER the new QoS requirement to the PCRF
	4	verify	Call ongoing, unicast MC bearer updated

7.5.4 Update of an Unicast MC Bearer by MCPTT Participating AS [PCC/BEARERUPDATE/02]

Equivalent to clause 7.5.3 but it is the Participating AS the responsible for interacting with the PCRF using the MCPTT-5 reference point (equivalent to RX interface).

Message Sequence Diagram

Figure 37: PCC/BEARERUPDATE/02 Message Sequence

Message Details

```
[3] MCPTT Participating --> PCRF

AA-Request

Auth-Application-Id: 3GPP Rx (16777236)
Service-Info-Status: FINAL_SERVICE_INFORMATION (0)
Media-Component-Description
  Media-Component-Number: 1
  Media-Sub-Component:
    Flow-Number: 1
    Flow-Status: ENABLED (2)
    Flow-Description: permit out 17 from ... to ...
    Flow-Description: permit in 17 from ... to ...
    Flow-Usage: NO_INFORMATION (0)
  Media-Sub-Component:
    Flow-Number: 2
    Flow-Status: ENABLED (2)
    Flow-Description: permit out 17 from ... to ...
    Flow-Description: permit in 17 from ... to ...
    Flow-Usage: RTCP (1)
  Codec-Data: uplink offer m=audio...
  Codec-Data: downlink answer m=audio...
  Media-Type: AUDIO (0)
Media-Component-Description
  Media-Component-Number: 2
  Media-Sub-Component:
    Flow-Number: 1
    Flow-Status: ENABLED (2)
    Flow-Description: permit out 17 from ... to ...
    Flow-Description: permit in 17 from ... to ...
    Flow-Usage: NO_INFORMATION (0)
  Codec-Data: uplink offer m=application...
  Codec-Data: downlink answer m=application...
  Media-Type: APPLICATION (3)
Rx-Request-Type: UPDATE_REQUEST (1)
MCPTT-Identifier: mcpttp
Reservation-Priority: PRIORITY-TEN (10)
AF-Application-Identifier: urn:urn-7:3gpp-service.ims.icsi.mcptt
...
```

Interoperability Test Description

Table 40: PCC/BEARERUPDATE/02

Interoperability Test Description			
Identifier	PCC/BEARERUPDATE/02		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and MCPTT participating signalling MCPTT PCC applications		
Configuration(s)	• CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_RX, MCPTT-Part_MCPTT-FC (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS and MCPTT system • Ongoing private call between User 1 and User 2 with certain bearer conditions		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	Change in the conditions of the ongoing call
	2	check	The reINVITE traverses the IMS Core without triggering any PCC mechanism
	3	check	reINVITE received at the MCPTT participating server of User 1
	4	check	The participating signals via DIAMETER the updated QoS requirement to the PCRF
	5	verify	Call ongoing, unicast MC bearer updated

7.6 eMBMS (EMBMS)

7.6.1 void

7.6.2 Use of dynamically established MBMS bearers in prearranged MCPTT group calls with pre-allocated TMGIs [EMBMS/ACTIVATEBEARER/WPRETMGI/01]

In an on-going prearranged MCPTT group call the MCPTT Participating server uses the MB2-C interface to the BM-SC to allocate a TMGI using the GCS-Action-Request message and procedures described in clause 5.2.1 in ETSI TS 129 468 [13]. Later, it uses the allocated TMGI to request the activation of a MBMS bearer by using the GCS-Action-Request with the MBMS StartStop Indication AVP set to "START" as described in clause 5.3.2 in ETSI TS 129 468 [13]. Upon successful activation the MCPTT Participating may send the multicast data flow to the MB2-U endpoint (unicast IP and Port in the BM-SC).

Then, the Participating notifies client(s) using a SIP MESSAGE request as described in clause 14.2.2.2 in ETSI TS 124 379 [4] that a new MBMS bearer is available in the service area. This message includes the TMGI, the port of the general purpose subchannel and the multicast IP. When the client enters the MBMS service area and starts listening to the general purpose subchannel, it notifies the Participating server about this event with a SIP MESSAGE as described in clause 14.3.3 in ETSI TS 124 379 [4]. After receiving this message the Participating server can start sending Map-Group-To-Bearer messages to the BM-SC IP and port received in MB2-C procedures (MB2-U interface). These messages include the MCPTT group identity and the media/floor control subchannel ports. The BM-SC is in charge of delivering these messages to the MCPTT clients using the MBMS bearer. When the clients receive this information, they will send another SIP MESSAGE to notify that they are able to listen to audio and floor control subchannels through MBMS. When the Participating server receives this message, it will start sending RTP audio packets and floor control TAKEN and IDLE messages via MB2-U interface.

NOTE: In all eMBMS sequence diagrams the MCCP term is used for the MBMS signalling protocol. In newer versions (i.e. March 2017) of ETSI TS 124 379 [4] the term MCMC is used. However the old notation is kept in the present document to respect the alignment with the December 2016 3GPP version.

Message Sequence Diagram

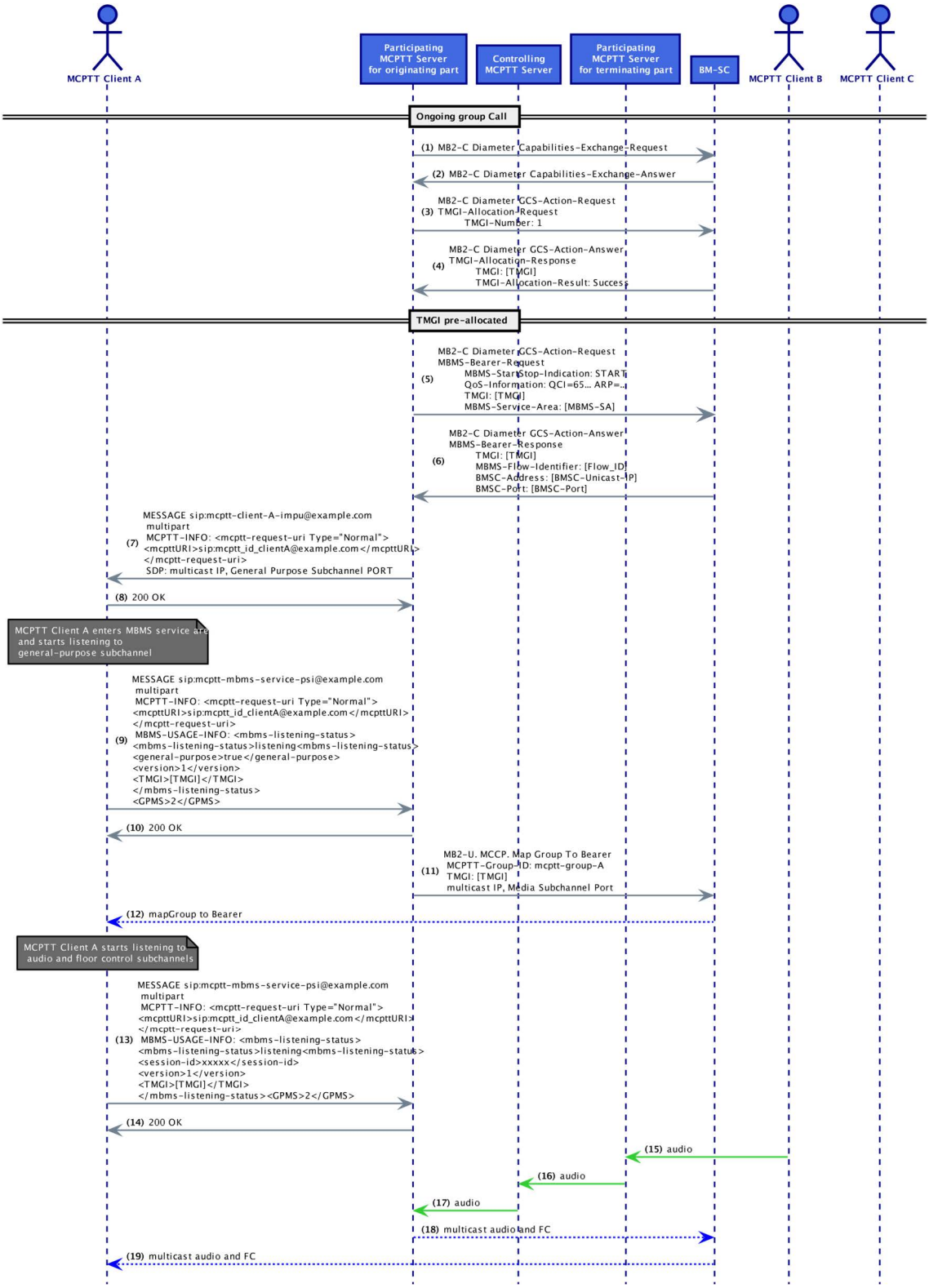

Figure 38: EMBMS/ACTIVATEBEARER/WPRETMGI/01 Message Sequence

Message Details

```
[3] MB2-C GCS-Action-Request  MCPTT Participating --> BM-SC

Origin-Host: mcptt-orig-part-server.example.com
Origin-Realm: example.com
```

```
Destination-Host: bm-sc.example.com
Destination-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
TMGI-Allocation-Request:
  TMGI-Number: 1
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support
```

[4] MB2-C GCS-Action-Answer BM-SC --> MCPTT Participating

```
Origin-Host: bm-sc.example.com
Origin-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
Result-Code: DIAMETER_SUCCESS (2001)
TMGI-Allocation-Response:
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
  MBMS-Session-Duration: 070800
    .... .... .... .... .000 0000 = Estimated session duration days: 0
    0000 0001 0010 1100 0... .... = Estimated session duration seconds: 600
  TMGI-Allocation-Result: 1
    ...0 .... = Too many TMGIs requested: Not set
    .... 0... = Unknown TMGI: Not set
    .... .0.. = Resources exceeded: Not set
    .... ..0. = Authorization rejected: Not set
    .... ...1 = Success: Set
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support
```

[5] MB2-C GCS-Action-Request MCPTT Participating --> BM-SC

```
Origin-Host: mcptt-orig-part-server.example.com
Origin-Realm: example.com
Destination-Host: bm-sc.example.com
Destination-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
MBMS-Bearer-Request:
  MBMS-StartStop-Indication: START (0)
  QoS-Information:
    QoS-Class-Identifier: 65
    Max-Requested-Bandwidth-DL: 41000
    Guaranteed-Bitrate-DL: 41000
    Allocation-Retention-Priority:
      Priority-Level: 5
      Pre-emption-Capability: PRE-EMPTION_CAPABILITY_ENABLED (0)
      Pre-emption-Vulnerability: PRE-EMPTION_VULNERABILITY_ENABLED (0)
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
  MB2U-Security: 0
  MBMS-Service-Area: 0230391ed2ad9c
    Number of MBMS service area codes: 3
    MBMS service area code: 12345
    MBMS service area code: 7890
    MBMS service area code: 44444
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support
```

[6] MB2-C GCS-Action-Answer BM-SC --> MCPTT Participating

```
Origin-Host: bm-sc.example.com
Origin-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
MBMS-Bearer-Response:
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
  MBMS-Flow-Identifier: 0001
  MBMS-Session-Duration: 012c00
  .... .... .... .... .000 0000 = Estimated session duration days: 0
  0000 0001 0010 1100 0... .... = Estimated session duration seconds: 600
  BMSC-Address: [BMSC-Unicast-IP]
  BMSC-Port: [BMSC-Port]
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support


[7] MESSAGE MCPTT Participating --> MCPTT Client A

MESSAGE sip:mcptt-client-A-impu@example.com SIP/2.0
From: <sip:mcptt-mbms-service@example.com>;tag=[tag]
To: <sip:mcptt-client-A-impu@example.com>
Call-ID: [call_id]
CSeq: [seq] MESSAGE
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Content-Type: multipart/mixed;boundary=[boundary]
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-mbms-service@example.com>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/sdp
Content-Disposition: render

v=0
o=MCPTT-SERVER 181160244 2621525762 IN IP4 [MULTICAST_IP]
m=audio 9 RTP/AVP 99
i=speech
c=IN IP4 0.0.0.0
a=rtpmap:99 AMR-WB/16000/1
a=fmtp:99 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
m=application [GPMS_PORT] udp MCPTT
c=IN IP4 [MULTICAST_IP]
m=application 9 udp MCPTT
c=IN IP4 0.0.0.0
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-mbms-usage-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcptt-mbms-usage-info xmlns="urn:3gpp:ns:mcpttMbmsUsage:1.0">
  <announcement>
    <TMGI>864a1600f110</TMGI>
    <QCI>65</QCI>
    <mbms-service-areas>0230391ed2ad9c</mbms-service-areas>
  </announcement>
  <GPMS>2</GPMS>
</mcptt-mbms-usage-info>

--[boundary]--
```

```
[9] MESSAGE MCPTT Client A --> MCPTT Participating

MESSAGE sip:mcptt-mbms-service@example.com SIP/2.0
From: <sip:mcptt-client-A@example.com>;tag=[tag]
To: <sip:mcptt-mbms-service@example.com>
Call-ID: [call_id]
CSeq: [cseq] MESSAGE
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
Content-Type: multipart/mixed;boundary=[boundary]

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-mbms-usage-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcptt-mbms-usage-info xmlns="urn:3gpp:ns:mcpttMbmsUsage:1.0">
  <mbms-listening-status>
    <mbms-listening-status>listening</mbms-listening-status>
    <general-purpose>true</general-purpose>
    <version>1</version>
    <TMGI>864a1600f110</TMGI>
  </mbms-listening-status>
  <GPMS>2</GPMS>
</mcptt-mbms-usage-info>
--[boundary]--


[11] MCCP Map Group To Bearer   MCPTT Participating --> BM-SC

Map Group To Bearer
MCPTT Group Identity: sip:mcptt-group-A@example.com
Temporary Mobile Group Identity (TMGI): 864a1600f110
MBMS Subchannel: 13000000271200002711ef000001
  0001 .... = Audio m-line Number: 1
  .... 0011 = Floor m-line Number: 3
  0000 .... = IP Version: IP version 4 (0)
  Floor Control Port: [FLOOR_CONTROL_SUBSCHANNEL_PORT]
  Media Port: [MEDIA_SUBSCHANNEL_PORT]
  IPv4 Address: [MULTICAST_IP]


[12] MESSAGE MCPTT Client A --> MCPTT Participating

MESSAGE sip:mcptt-mbms-service@example.com SIP/2.0
From: <sip:mcptt-client-A@example.com>;tag=[tag]
To: <sip:mcptt-mbms-service@example.com>
Call-ID: [call_id]
CSeq: [cseq] MESSAGE
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
Content-Type: multipart/mixed;boundary=[boundary]

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
```

```
Content-Type: application/vnd.3gpp.mcptt-mbms-usage-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcptt-mbms-usage-info xmlns="urn:3gpp:ns:mcpttMbmsUsage:1.0">
  <mbms-listening-status>
    <mbms-listening-status>listening</mbms-listening-status>
    <session-id>sip:session_id@mcptt-server.example.com</session-id>
    <version>1</version>
    <TMGI>864a1600f110</TMGI>
  </mbms-listening-status>
  <GPMS>2</GPMS>
</mcptt-mbms-usage-info>
--[boundary]--
```

Interoperability Test Description

Table 41: EMBMS/ACTIVATEBEARER/WPRETMGI/01

Interoperability Test Description			
Identifier	EMBMS/ACTIVATEBEARER/WPRETMGI/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling, eMBMS signalling using SIP to the clients and MB2-C/U interfaces to the BM-SC		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • Diameter in MB2-C (see ETSI TS 129 468 [13])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC, MCPTTClient_EMBMS (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_GCSE (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id - Ongoing prearranged group call		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	MCPTT Participating requests the allocation of a TMGI
	2	stimulus	Upon successful TMGI allocation MCPTT participating requests the activation of a MBMS bearer
	3	stimulus	Upon successful MBMS bearer activation MCPTT participating notifies users using SIP MESSAGE the general purpose subchannel port where the multicast signalling will be sent to
	4	stimulus	Users notify using SIP MESSAGE that they are listening to the general purpose subchannel
	5	stimulus	Participating uses Map Group To Bearer to start sending Floor Control/Audio packets over multicast
	6	check	Users successfully listening to multicast group call

7.6.3 Use of dynamically established MBMS bearers in prearranged MCPTT group calls without pre-allocated TMGIs [EMBMS/ACTIVATEBEARER/WOPRETMGI/01]

The procedure is equivalent to that in clause 7.6.2 but no TMGI is explicitly pre-allocated. Instead, the BM-SC will provide the TMGI (i.e. by previous signalling or preprovisioning) and no TMGI is signalled in the GCS-Action-Request message.

Message Sequence Diagram

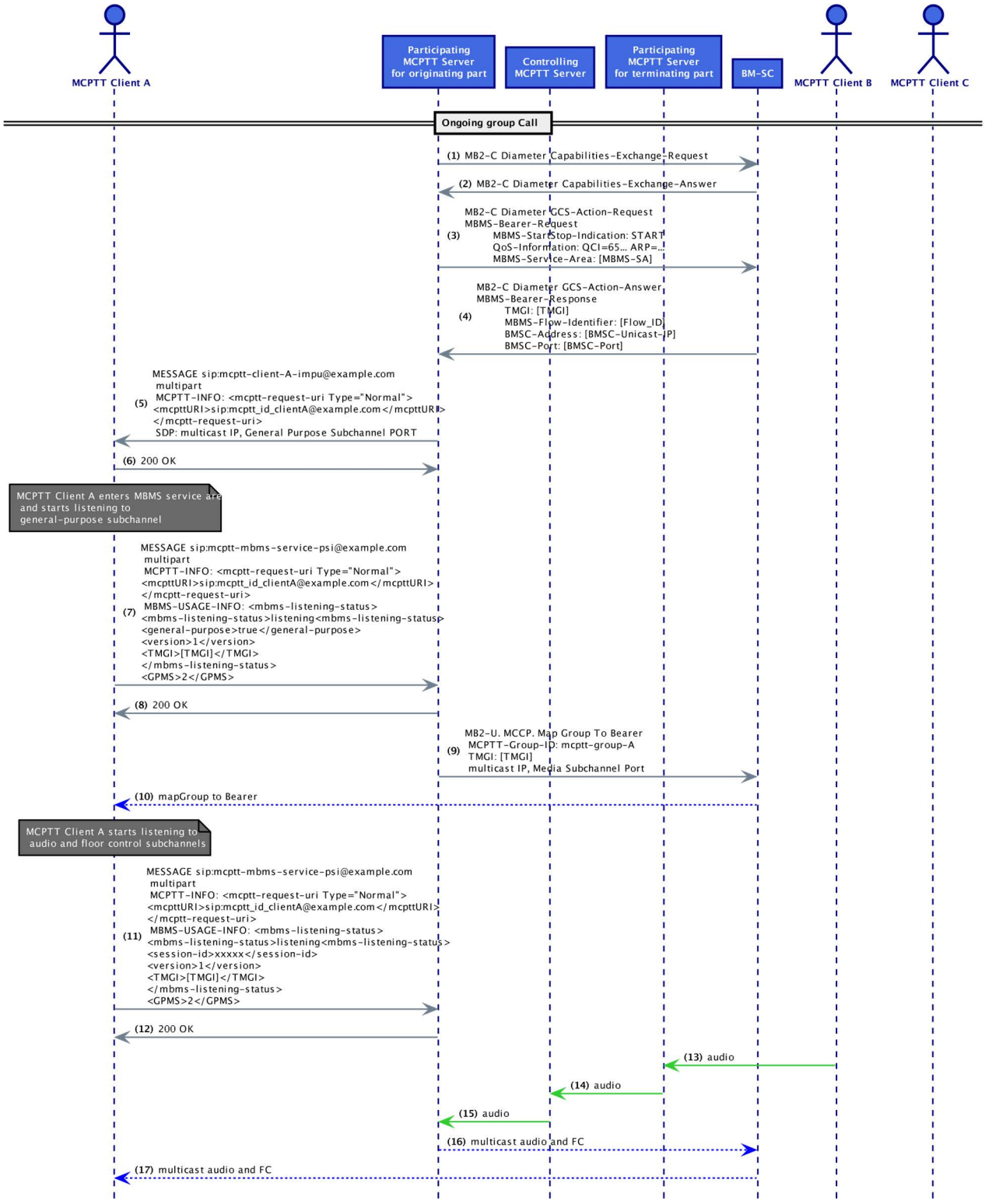

Figure 39: EMBMS/ACTIVATEBEARER/WOPRETMGI/01 Message Sequence

Message Details

```
[3] MB2-C GCS-Action-Request  MCPTT Participating --> BM-SC

Origin-Host: mcptt-orig-part-server.example.com
Origin-Realm: example.com
Destination-Host: bm-sc.example.com
Destination-Realm: example.com
```

```
Auth-Application-Id: 3GPP MB2-C (16777335)
MBMS-Bearer-Request:
  MBMS-StartStop-Indication: START (0)
  QoS-Information:
    QoS-Class-Identifier: 65
    Max-Requested-Bandwidth-DL: 41000
    Guaranteed-Bitrate-DL: 41000
    Allocation-Retention-Priority:
      Priority-Level: 5
      Pre-emption-Capability: PRE-EMPTION_CAPABILITY_ENABLED (0)
      Pre-emption-Vulnerability: PRE-EMPTION_VULNERABILITY_ENABLED (0)
  MB2U-Security: 0
  MBMS-Service-Area: 0230391ed2ad9c
    Number of MBMS service area codes: 3
    MBMS service area code: 12345
    MBMS service area code: 7890
    MBMS service area code: 44444
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support


[4] MB2-C GCS-Action-Answer  BM-SC --> MCPTT Participating

Origin-Host: bm-sc.example.com
Origin-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
MBMS-Bearer-Response:
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
  MBMS-Flow-Identifier: 0001
  MBMS-Session-Duration: 012c00
  .... .... .... .... .000 0000 = Estimated session duration days: 0
  0000 0001 0010 1100 0... .... = Estimated session duration seconds: 600
  BMSC-Address: [BMSC-Unicast-IP]
  BMSC-Port: [BMSC-Port]
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support
```

Interoperability Test Description

Table 42: EMBMS/ACTIVATEBEARER/WOPRETMGI/01

Interoperability Test Description			
Identifier	EMBMS/ACTIVATEBEARER/WOPRETMGI/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling, eMBMS signalling using SIP to the clients and MB2-C/U interfaces to the BM-SC		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • Diameter in MB2-C (see ETSI TS 129 468 [13])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC, MCPTTClient_EMBMS (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_GCSE (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id Ongoing prearranged group call		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	MCPTT Participating requests the activation of a MBMS bearer with no TMGI
	2	stimulus	Upon successful MBMS bearer activation MCPTT participating notifies users using SIP MESSAGE the general purpose subchannel port where the multicast signalling will be sent to
	3	stimulus	Users notify using SIP MESSAGE that they are listening to the general purpose subchannel
	4	stimulus	Participating uses Map Group To Bearer to start sending Floor Control/Audio packets over multicast
	5	check	Users successfully listening to multicast group call

7.6.4 Use of pre-established MBMS bearers in prearranged group calls with pre-allocated TMGIs [EMBMS/PREBEARER/WPRETMGI/01]

This test case is equivalent to that in clause 7.6.2 but all the MBMS bearer activation and signalling procedures is carried out before the Group Call setup is carried out (instead of dynamic embms bearer activation on an ongoing group call).

Following high level description in Stage 2 ETSI TS 123 179 [2], clauses 10.10.2 and 10.10.4.2.1 and, more specifically, the flow diagram in figure 10.10.2.2-1, the Activation and Announcement of the EMBMS bearer would be prior to the Call Setup procedure. Then, the Map Group To Bearer messages will notify EMBMS users about the new session.

Message Sequence Diagram

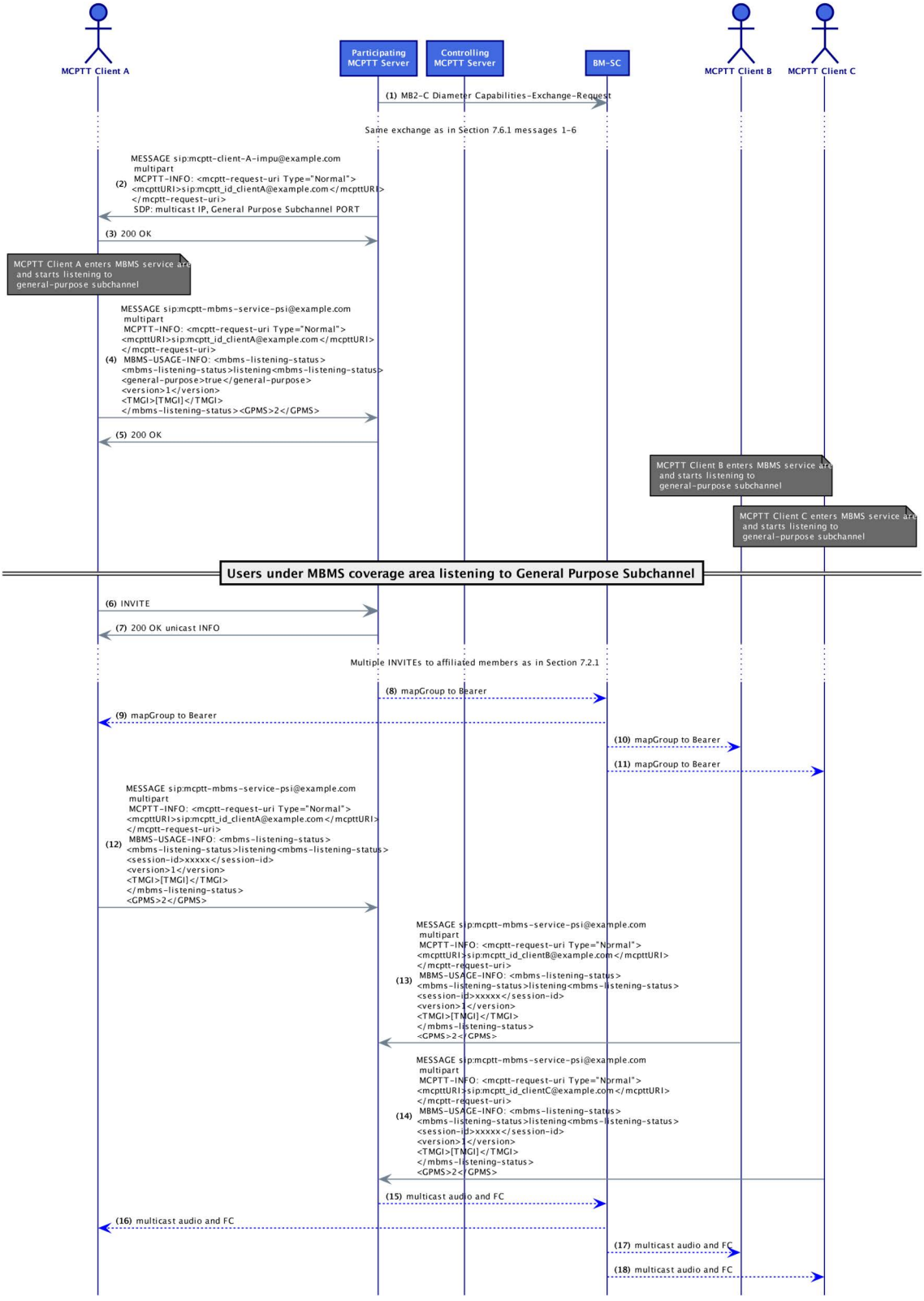

Figure 40: EMBMS/PREBEARER/WPRETMGI/01 Message Sequence

Message Details

```
[2] MESSAGE MCPTT Participating --> MCPTT Client A

MESSAGE sip:mcptt-client-A-impu@example.com SIP/2.0
From: <sip:mcptt-mbms-service@example.com>;tag=[tag]
To: <sip:mcptt-client-A-impu@example.com>
Call-ID: [call_id]
CSeq: [seq] MESSAGE
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Content-Type: multipart/mixed;boundary=[boundary]
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-mbms-service@example.com>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/sdp
Content-Disposition: render

v=0
o=MCPTT-SERVER 181160244 2621525762 IN IP4 [MULTICAST_IP]
m=audio 9 RTP/AVP 99
i=speech
c=IN IP4 0.0.0.0
a=rtpmap:99 AMR-WB/16000/1
a=fmtp:99 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
m=application [GPMS_PORT] udp MCPTT
c=IN IP4 [MULTICAST_IP]
m=application 9 udp MCPTT
c=IN IP4 0.0.0.0
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-mbms-usage-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcptt-mbms-usage-info xmlns="urn:3gpp:ns:mcpttMbmsUsage:1.0">
  <announcement>
    <TMGI>864a1600f110</TMGI>
    <QCI>65</QCI>
    <mbms-service-areas>0230391ed2ad9c</mbms-service-areas>
  </announcement>
  <GPMS>2</GPMS>
</mcptt-mbms-usage-info>

--[boundary]--


[4] MESSAGE MCPTT Client A --> MCPTT Participating

MESSAGE sip:mcptt-mbms-service@example.com SIP/2.0
From: <sip:mcptt-client-A@example.com>;tag=[tag]
To: <sip:mcptt-mbms-service@example.com>
Call-ID: [call_id]
CSeq: [cseq] MESSAGE
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
Content-Type: multipart/mixed;boundary=[boundary]

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
```

```
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-mbms-usage-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcptt-mbms-usage-info xmlns="urn:3gpp:ns:mcpttMbmsUsage:1.0">
  <mbms-listening-status>
    <mbms-listening-status>listening</mbms-listening-status>
    <general-purpose>true</general-purpose>
    <version>1</version>
    <TMGI>864a1600f110</TMGI>
  </mbms-listening-status>
  <GPMS>2</GPMS>
</mcptt-mbms-usage-info>
--[boundary]--


[8] MESSAGE MCPTT Client A --> MCPTT Participating

MESSAGE sip:mcptt-mbms-service@example.com SIP/2.0
From: <sip:mcptt-client-A@example.com>;tag=[tag]
To: <sip:mcptt-mbms-service@example.com>
Call-ID: [call_id]
CSeq: [cseq] MESSAGE
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
Content-Type: multipart/mixed;boundary=[boundary]

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-mbms-usage-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcptt-mbms-usage-info xmlns="urn:3gpp:ns:mcpttMbmsUsage:1.0">
  <mbms-listening-status>
    <mbms-listening-status>listening</mbms-listening-status>
    <session-id>sip:session_id@mcptt-server.example.com</session-id>
    <version>1</version>
    <TMGI>864a1600f110</TMGI>
  </mbms-listening-status>
  <GPMS>2</GPMS>
</mcptt-mbms-usage-info>
--[boundary]--
```

Interoperability Test Description

Table 43: EMBMS/PREBEARER/WPRETMGI/01

Interoperability Test Description			
Identifier	EMBMS/PREBEARER/WPRETMGI/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling, eMBMS signalling using SIP to the clients and MB2-C/U interfaces to the BM-SC		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • Diameter in MB2-C (see ETSI TS 129 468 [13])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC, MCPTTClient_EMBMS (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_GCSE (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	MCPTT Participating requests the allocation of a TMGI and activation of MBMS bearer following procedures in clause 7.6.2
	2	stimulus	Users notify the participating about their status (listening to general purpose subchannel) using SIP MESSAGE
	3	stimulus	Users notify using SIP MESSAGE that they are listening to the general purpose subchannel
	4	stimulus	User initiates the Group Call using traditional SIP signalling
	5	stimulus	Participating uses Map Group To Bearer to all participants
	6	stimulus	Upon reception of proper listening to the new MBMS bearer and MCPTT participating starts sending audio/FC over MBMS
	7	check	Users successfully listening to multicast group call

7.6.5 Use of pre-established MBMS bearers in prearranged group calls without pre-allocated TMGIs [EMBMS/PREBEARER/WOPRETMGI/01]

This test case is equivalent to that in clause 7.6.3 but all the MBMS bearer activation and signalling procedures is carried out before the Group Call setup is carried out (instead of dynamic embms bearer activation on an ongoing group call).

Following high level description in Stage 2 ETSI TS 123 179 [2] clauses 10.10.2 and 10.10.4.2.1 and, more specifically, the flow diagram in figure 10.10.2.2-1, the Activation and Announcement of the EMBMS bearer would be prior to the Call Setup procedure. Then, the Map Group To Bearer messages will notify EMBMS users about the new session.

Message Sequence Diagram

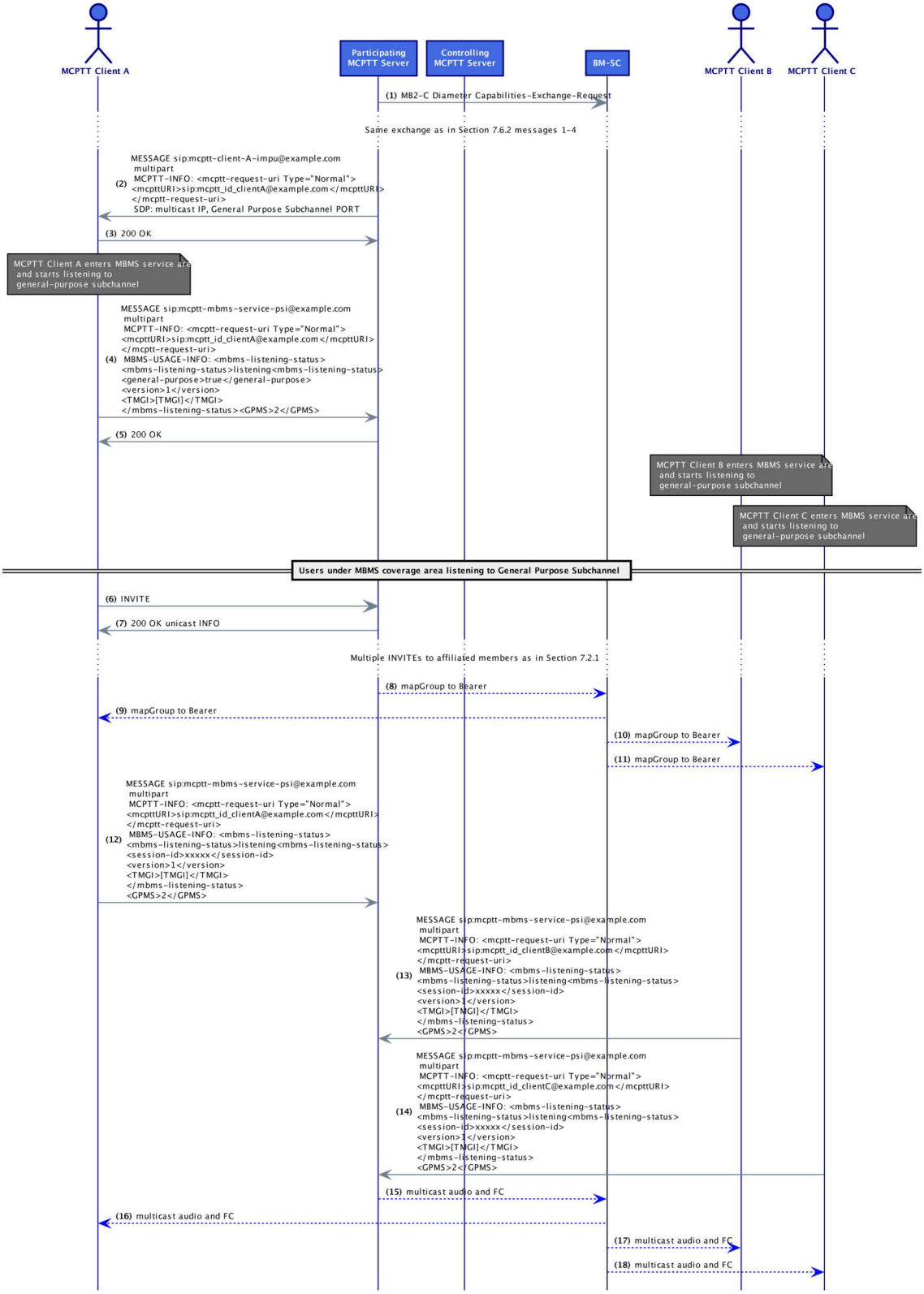

Figure 41: EMBMS/PREBEARER/WOPRETMGI/01 Message Sequence

Message Details

```
[2] MESSAGE MCPTT Participating --> MCPTT Client A

MESSAGE sip:mcptt-client-A-impu@example.com SIP/2.0
From: <sip:mcptt-mbms-service@example.com>;tag=[tag]
```

```
To: <sip:mcptt-client-A-impu@example.com>
Call-ID: [call_id]
CSeq: [seq] MESSAGE
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Content-Type: multipart/mixed;boundary=[boundary]
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-mbms-service@example.com>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/sdp
Content-Disposition: render

v=0
o=MCPTT-SERVER 181160244 2621525762 IN IP4 [MULTICAST_IP]
m=audio 9 RTP/AVP 99
i=speech
c=IN IP4 0.0.0.0
a=rtpmap:99 AMR-WB/16000/1
a=fmtp:99 mode-change-period=1; mode-change-capability=2; mode-change-neighbor=0; max-red=0
m=application [GPMS_PORT] udp MCPTT
c=IN IP4 [MULTICAST_IP]
m=application 9 udp MCPTT
c=IN IP4 0.0.0.0
...
--[boundary]
Content-Type: application/vnd.3gpp.mcptt-mbms-usage-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcptt-mbms-usage-info xmlns="urn:3gpp:ns:mcpttMbmsUsage:1.0">
  <announcement>
    <TMGI>864a1600f110</TMGI>
    <QCI>65</QCI>
    <mbms-service-areas>0230391ed2ad9c</mbms-service-areas>
  </announcement>
  <GPMS>2</GPMS>
</mcptt-mbms-usage-info>

--[boundary]--


[4] MESSAGE MCPTT Client A --> MCPTT Participating

MESSAGE sip:mcptt-mbms-service@example.com SIP/2.0
From: <sip:mcptt-client-A@example.com>;tag=[tag]
To: <sip:mcptt-mbms-service@example.com>
Call-ID: [call_id]
CSeq: [cseq] MESSAGE
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
Content-Type: multipart/mixed;boundary=[boundary]

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-mbms-usage-info+xml
```

```
<?xml version="1.0" encoding="UTF-8"?>
<mcptt-mbms-usage-info xmlns="urn:3gpp:ns:mcpttMbmsUsage:1.0">
  <mbms-listening-status>
    <mbms-listening-status>listening</mbms-listening-status>
    <general-purpose>true</general-purpose>
    <version>1</version>
    <TMGI>864a1600f110</TMGI>
  </mbms-listening-status>
  <GPMS>2</GPMS>
</mcptt-mbms-usage-info>
--[boundary]--
```

[8] MESSAGE MCPTT Client A --> MCPTT Participating

```
MESSAGE sip:mcptt-mbms-service@example.com SIP/2.0
From: <sip:mcptt-client-A@example.com>;tag=[tag]
To: <sip:mcptt-mbms-service@example.com>
Call-ID: [call_id]
CSeq: [cseq] MESSAGE
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
Content-Type: multipart/mixed;boundary=[boundary]

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-mbms-usage-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcptt-mbms-usage-info xmlns="urn:3gpp:ns:mcpttMbmsUsage:1.0">
  <mbms-listening-status>
    <mbms-listening-status>listening</mbms-listening-status>
    <session-id>sip:session_id@mcptt-server.example.com</session-id>
    <version>1</version>
    <TMGI>864a1600f110</TMGI>
  </mbms-listening-status>
  <GPMS>2</GPMS>
</mcptt-mbms-usage-info>
--[boundary]--
```

Interoperability Test Description

Table 44: EMBMS/PREBEARER/WOPRETMGI/01

Interoperability Test Description			
Identifier	EMBMS/PREBEARER/WOPRETMGI/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling, eMBMS signalling using SIP to the clients and MB2-C/U interfaces to the BM-SC		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • Diameter in MB2-C (see ETSI TS 129 468 [13])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC, MCPTTClient_EMBMS (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_GCSE (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	MCPTT Participating requests the activation of MBMS bearer following procedures in clause 7.6.3
	2	stimulus	Users notify the participating about their status (listening to general purpose subchannel) using SIP MESSAGE
	3	stimulus	Users notify using SIP MESSAGE that they are listening to the general purpose subchannel
	4	stimulus	User initiates the Group Call using traditional SIP signalling
	5	stimulus	Participating uses Map Group To Bearer to all participants
	6	stimulus	Upon reception of proper listening to the new MBMS bearer and MCPTT participating starts sending audio/FC over MBMS
	7	check	Users successfully listening to multicast group call

7.6.6 Modification of MBMS bearers upon reception of emergency upgrade request [EMBMS/MODIFYBEARER/01]

This test covers the upgrade to emergency state of an on-going prearranged MCPTT group call. The MCPTT Participating server uses the MB2-C interface to the BM-SC to update a previously activated eMBMS bearer, which was set following any of the procedures described in clauses 7.6.2, 7.6.3, 7.6.4 or 7.6.5 of the present document. The MCPTT Participating server will send a GCS-Action-Request with the MBMS-StartStop-Indication AVP set to "UPDATE" value as described in clause 5.3.4 in ETSI TS 129 468 [13]. In the reINVITE request the MCPTT Client includes a new Resource-Priority header set to a high priority value, which corresponds with the emergency state. The MCPTT Participating server shall set the Allocation-Retention-Priority AVP of the MBMS-Bearer-Request accordingly.

Message Sequence Diagram

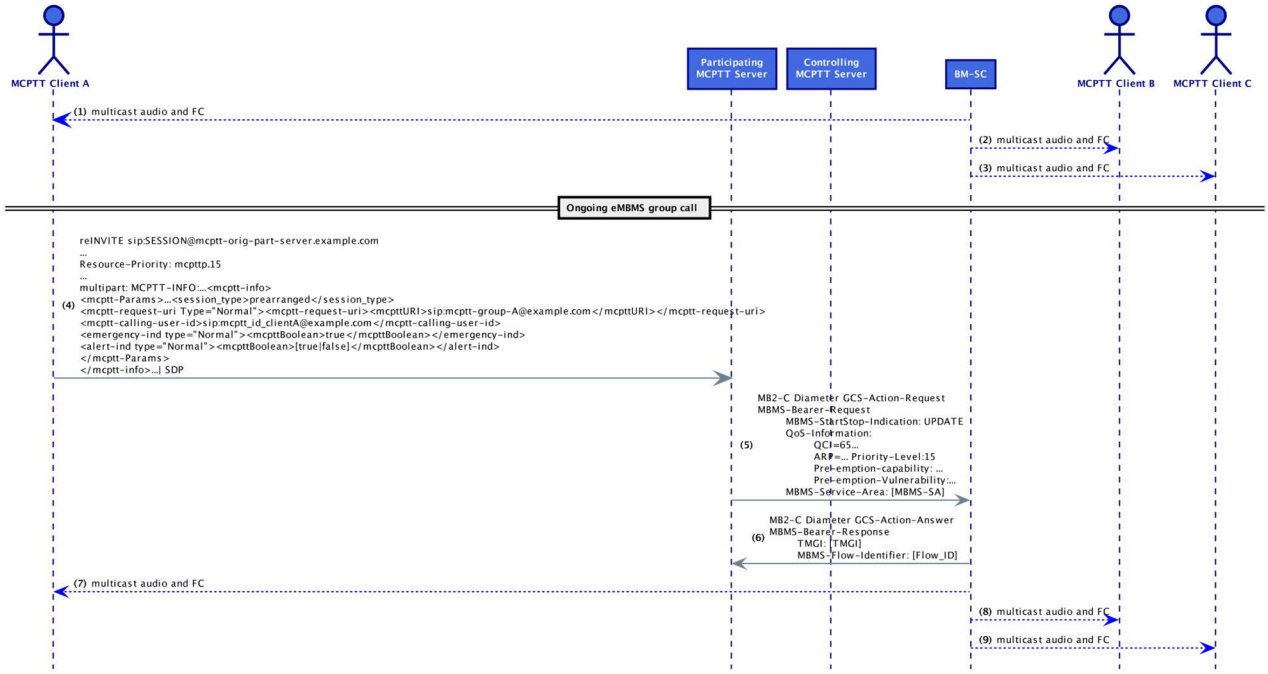

Figure 42: EMBMS/MODIFYBEARER/01 Message Sequence

Message Details

```
[2] MB2-C GCS-Action-Request  MCPTT Participating --> BM-SC

Origin-Host: mcptt-orig-part-server.example.com
Origin-Realm: example.com
Destination-Host: bm-sc.example.com
Destination-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
MBMS-Bearer-Request:
  MBMS-StartStop-Indication: UPDATE (2)
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
  MBMS-Flow-Identifier: 0001
  QoS-Information:
    QoS-Class-Identifier: 65
    Max-Requested-Bandwidth-DL: 41000
    Guaranteed-Bitrate-DL: 41000
    Allocation-Retention-Priority:
      Priority-Level: 15
      Pre-emption-Capability: PRE-EMPTION_CAPABILITY_ENABLED (0)
      Pre-emption-Vulnerability: PRE-EMPTION_VULNERABILITY_ENABLED (0)
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support


[3] MB2-C GCS-Action-Answer  BM-SC --> MCPTT Participating

Origin-Host: bm-sc.example.com
Origin-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
MBMS-Bearer-Response:
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
  MBMS-Flow-Identifier: 0001
Supported-Features:
```

```
Vendor-Id: 3GPP (10415)
Feature-List-ID: 1
Feature-List:
........x - Heartbeat support
........x. - MBMS cell list support
```

Interoperability Test Description

Table 45: EMBMS/MODIFYBEARER/01

Interoperability Test Description			
Identifier	EMBMS/MODIFYBEARER/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling, eMBMS signalling using SIP to the clients and MB2-C/U interfaces to the BM-SC to update an existing MBMS bearer		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • Diameter in MB2-C (see ETSI TS 129 468 [13])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC, MCPTTClient_EMBMS (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_GCSE (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id • Ongoing group call and MBMS bearer stablished		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	MCPTT User reINVITEs to notify the new emergency call condition using proper <emergency-ind>
	2	stimulus	Participating sends a GCS-Action-Request to the BM-SC to UPDATE the bearer
	3	stimulus	BM-SC modifies the bearer according and sends a response back
	4	check	MBMS bearer updated with emergency associated QoS Information

7.6.7 Deactivation of MBMS bearers after termination of a prearranged MCPTT group call with TMGI deallocation [EMBMS/DEACTBEARER/WTMGIDEA/01]

When the Participating MCPTT server receives a BYE request for the last user left in an on-going prearranged MCPTT group session which uses eMBMS, it shall first send an Unmap Group to Bearer request over MB2-U channel. If configured to do so, the Participating MCPTT server shall also deactivate the eMBMS bearer and the TMGI which was allocated for the eMBMS activation. This test case comprises the deactivation of an eMBMS bearer after the termination of a MCPTT session and also the deallocation of the TMGI.

The Participating MCPTT server shall deactivate the eMBMS bearer by sending a GCS-ActionRequest with the MBMS-StartStop-Indication AVP set to "STOP" value as described in clause 5.3.3 in ETSI TS 129 468 [13]. After deactivating the eMBMS bearer, the Participating MCPTT server shall also deallocate the TMGI which was allocated for the MCPTT session. The Participating MCPTT server will follow the procedures described in clause 5.2.2 of ETSI TS 129 468 [13]. It shall send another GCS-Action-Request with a TMGI-Deallocation-Request AVP, which includes the TMGI to be deallocated.

Message Sequence Diagram

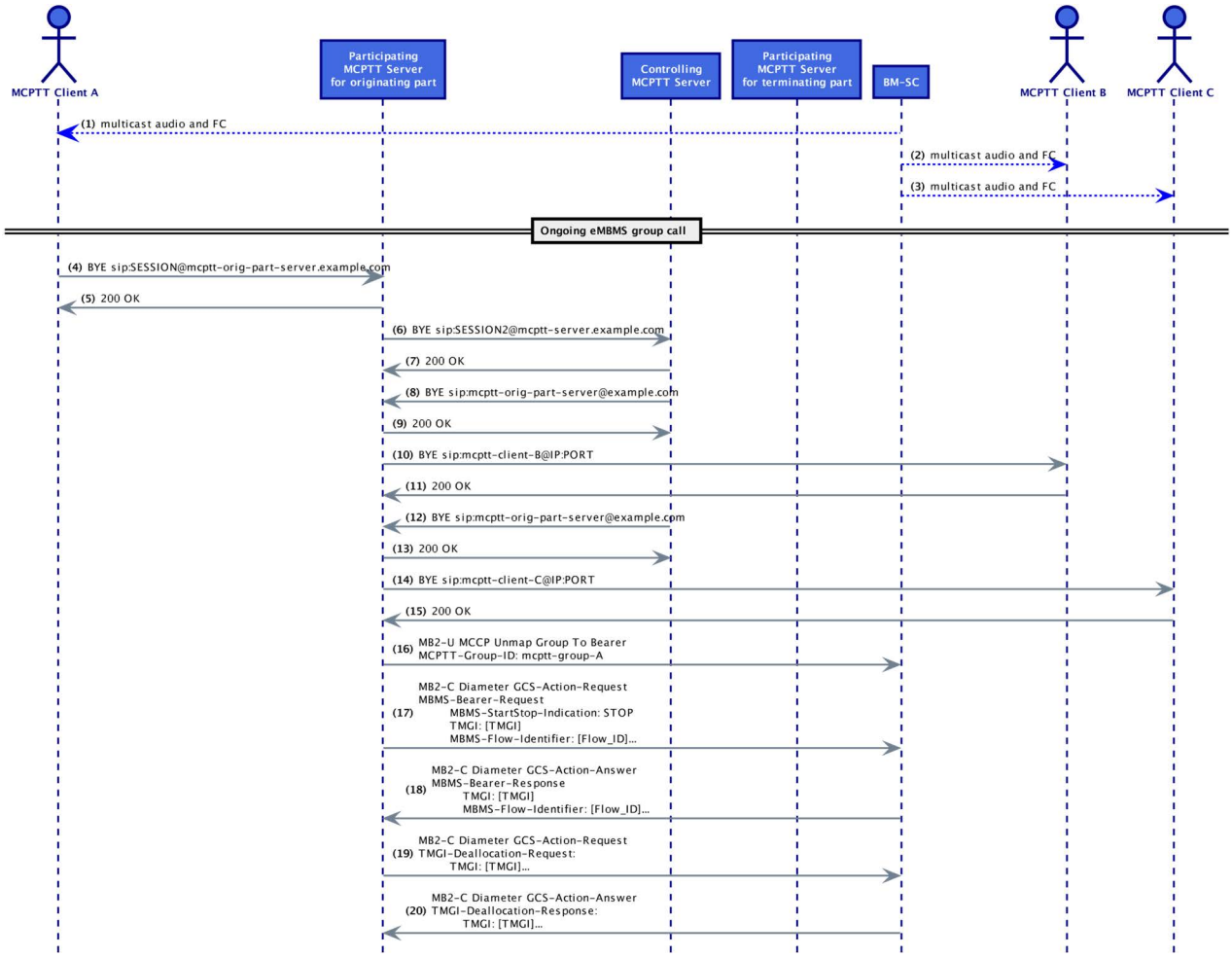

Figure 43: EMBMS/DEACTBEARER/WTMGIDEA/01 Message Sequence

Message Details

```
[13] MCCP Unmap Group To Bearer   MCPTT Participating --> BM-SC

Unmap Group To Bearer
MCPTT Group Identity: sip:mcptt-group-A@example.com

[14] MB2-C GCS-Action-Request  MCPTT Participating --> BM-SC

Origin-Host: mcptt-orig-part-server.example.com
Origin-Realm: example.com
Destination-Host: bm-sc.example.com
Destination-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
MBMS-Bearer-Request:
  MBMS-StartStop-Indication: STOP (1)
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
  MBMS-Flow-Identifier: 0001
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support
```

```
[15] MB2-C GCS-Action-Answer  BM-SC --> MCPTT Participating

Origin-Host: bm-sc.example.com
Origin-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
MBMS-Bearer-Response:
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
  MBMS-Flow-Identifier: 0001
  MBMS-Bearer-Result: 0x00000001 (Success)
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support


[16] MB2-C GCS-Action-Request  MCPTT Participating --> BM-SC

Origin-Host: mcptt-orig-part-server.example.com
Origin-Realm: example.com
Destination-Host: bm-sc.example.com
Destination-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
TMGI-Deallocation-Request:
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support


[17] MB2-C GCS-Action-Answer  BM-SC --> MCPTT Participating

Origin-Host: bm-sc.example.com
Origin-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
TMGI-Deallocation-Response:
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support
```

Interoperability Test Description

Table 46: EMBMS/DEACTBEARER/WTMGIDEA/01

Interoperability Test Description			
Identifier	EMBMS/DEACTBEARER/WTMGIDEA/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling, eMBMS signalling using SIP to the clients and MB2-C/U interfaces to the BM-SC to deactivate a MBMS bearer		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • Diameter in MB2-C (see ETSI TS 129 468 [13])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC, MCPTTClient_EMBMS (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_GCSE (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id • Ongoing group call and MBMS bearer stablished		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	Participating receives the BYE from the last user therefore group call is terminated
	2	stimulus	Participating sends an Unmap Group to Bearer request over MB2-U channel
	3	stimulus	Participating sends a GCS-Action-Request with the MBMS-StartStop-Indication AVP set to "STOP"
	4	stimulus	Participating request the deallocation of the associated TMGI
	5	check	MBMS bearer and TMGI deactivated/deallocated

7.6.8 Deactivation of MBMS bearers after termination of a prearranged MCPTT group call without TMGI deallocation [EMBMS/DEACTBEARER/WOTMGIDEA/01]

The procedure is equivalent to that in clause 7.6.7 but no TMGI is deallocated after MCPTT session termination.

Message Sequence Diagram

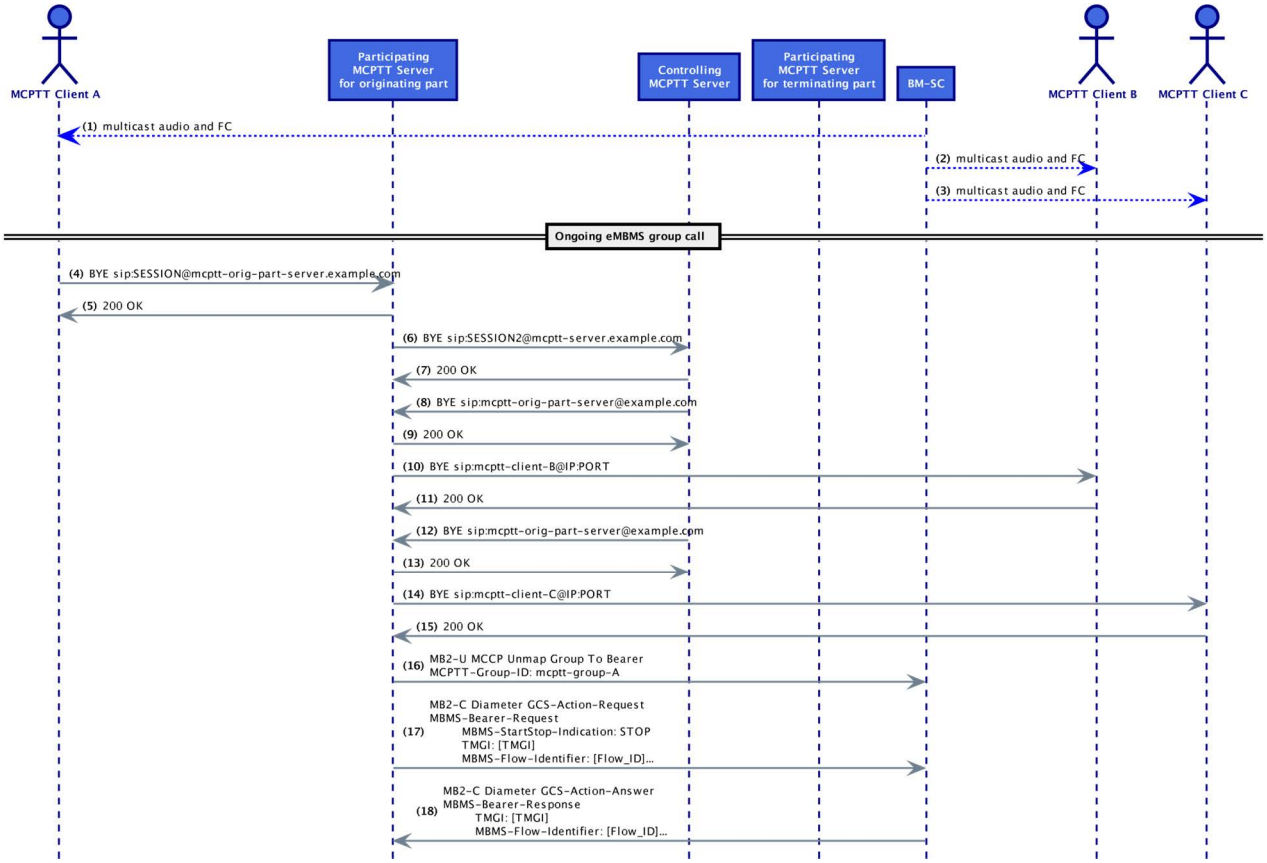

Figure 44: EMBMS/DEACTBEARER/WOTMGIDEA/01 Message Sequence

Message Details

```
[13] MCCP Unmap Group To Bearer   MCPTT Participating --> BM-SC

Unmap Group To Bearer
MCPTT Group Identity: sip:mcptt-group-A@example.com

[14] MB2-C GCS-Action-Request  MCPTT Participating --> BM-SC

Origin-Host: mcptt-orig-part-server.example.com
Origin-Realm: example.com
Destination-Host: bm-sc.example.com
Destination-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
MBMS-Bearer-Request:
  MBMS-StartStop-Indication: STOP (1)
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
  MBMS-Flow-Identifier: 0001
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support
```

```
[15] MB2-C GCS-Action-Answer  BM-SC --> MCPTT Participating

Origin-Host: bm-sc.example.com
Origin-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
MBMS-Bearer-Response:
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
  MBMS-Flow-Identifier: 0001
  MBMS-Bearer-Result: 0x00000001 (Success)
Supported-Features:
  Vendor-Id: 3GPP (10415)
  Feature-List-ID: 1
  Feature-List:
  .........x - Heartbeat support
  ........x. - MBMS cell list support
```

Interoperability Test Description

Table 47: EMBMS/DEACTBEARER/WOTMGIDEA/01

Interoperability Test Description			
Identifier	EMBMS/DEACTBEARER/WOTMGIDEA/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling, eMBMS signalling using SIP to the clients and MB2-C/U interfaces to the BM-SC to deactivate a MBMS bearer		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • Diameter in MB2-C (see ETSI TS 129 468 [13])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC, MCPTTClient_EMBMS (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_GCSE (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id • Ongoing group call and MBMS bearer stablished		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	Participating receives the BYE from the last user therefore group call is terminated
	2	stimulus	Participating sends an Unmap Group to Bearer request over MB2-U channel
	3	stimulus	Participating sends a GCS-Action-Request with the MBMS-StartStop-Indication AVP set to "STOP"
	4	check	MBMS bearer deactivated

7.6.9 Switching to unicast bearer after TMGI expiration [EMBMS/SWITCHTOUNITMGIEXP/01]

If a TMGI expires during an on-going MCPTT session which uses eMBMS bearers, the BM-SC shall notify the MCPTT server that the MBMS is no longer available, so that the MCPTT server can continue with the MCPTT session but sending the media over unicast bearers. The BM-SC will send a GCS-Notification-Request which includes a TMGI-Expiry AVP and a MBMS-BearerEvent AVP with the Bearer Terminated bit set within a MBMS-Bearer-Event-Notification AVP in accordance with the procedures described in clause 5.2.3 in ETSI TS 129 468 [13].

Message Sequence Diagram

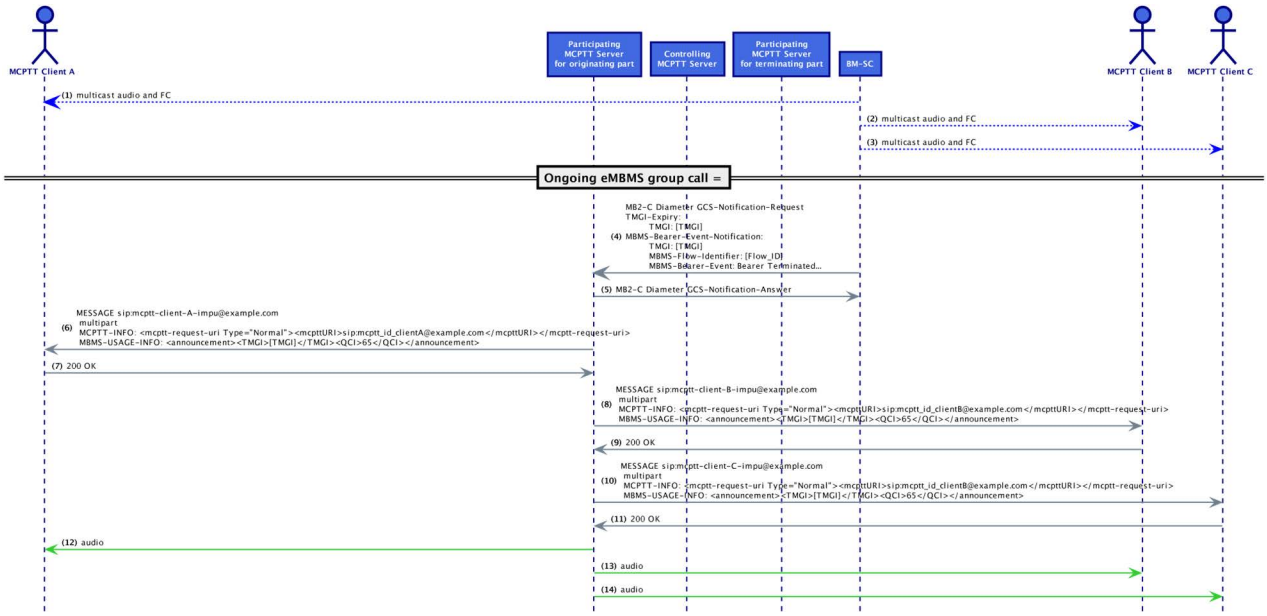

Figure 45: EMBMS/SWITCHTOUNITMGIEXP/01 Message Sequence

Message Details

```
[1] MB2-C GCS-Notification-Request  BM-SC --> MCPTT Participating

Origin-Host: bm-sc.example.com
Origin-Realm: example.com
Destination-Host: mcptt-orig-part-server.example.com
Destination-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
TMGI-Expiry:
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
MBMS-Bearer-Event-Notification:
  TMGI: 864a1600f110
    MBMS-Service-ID: 0x86a16
    MCC: 001
    MNC: 01
  MBMS-Flow-Identifier: 0001
  MBMS-Bearer-Event: 0x00000001
    .... ...1 = Bearer Terminated: Set


[2] MB2-C GCS-Notification-Answer  MCPTT Participating --> BM-SC

Origin-Host: mcptt-orig-part-server.example.com
Origin-Realm: example.com
Auth-Application-Id: 3GPP MB2-C (16777335)
Result-Code: DIAMETER_SUCCESS (2001)

[3] MESSAGE MCPTT Participating --> MCPTT Client A

MESSAGE sip:mcptt-client-A-impu@example.com SIP/2.0
```

```
From: <sip:mcptt-mbms-service@example.com>;tag=[tag]
To: <sip:mcptt-client-A-impu@example.com>
Call-ID: [call_id]
CSeq: [seq] MESSAGE
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcptt";require;explicit
Accept-Contact: *;+g.3gpp.mcptt;require;explicit
Content-Type: multipart/mixed;boundary=[boundary]
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-mbms-service@example.com>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-mbms-usage-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcptt-mbms-usage-info xmlns="urn:3gpp:ns:mcpttMbmsUsage:1.0">
  <announcement>
    <TMGI>864a1600f110</TMGI>
    <QCI>65</QCI>
  </announcement>
</mcptt-mbms-usage-info>

--[boundary]--
```

Interoperability Test Description

Table 48: EMBMS/SWITCHTOUNITMGIEXP/01

Interoperability Test Description			
Identifier	EMBMS/SWITCHTOUNITMGIEXP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling, eMBMS signalling using SIP to the clients and MB2-C/U interfaces to the BM-SC to switch to unicast		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • Diameter in MB2-C (see ETSI TS 129 468 [13])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC, MCPTTClient_EMBMS (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_GCSE (clause 6.5) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id • Ongoing group call and MBMS bearer stablished		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	BM-SC notifies the Participating about TMGI expiration
	2	stimulus	Participating notifies "n" users in the group call previously using eMBMS about the expiration
	3	check	Group call continues using multi-unicast flows

7.7 Affiliation (AFFIL)

7.7.1 MCPTT User subscribes to its own affiliation [AFFIL/DET/01]

A registered MCPTT User subscribes to its affiliation by following clauses 9.2.1.3 and 9.2.2.2.4 in ETSI TS 124 379 [4]. Regardless it is its own or other user's affiliation the procedure is rather equivalent. The MCPTT Client sends a SIP SUBSCRIBE message setting as Request-URI the public service identity identifying the originating participating MCPTT function serving the MCPTT user and an application/vnd.3gpp.mcptt-info+xml MIME body. In the application/vnd.3gpp.mcptt-info+xml MIME body, the <mcptt-request-uri> element is set to the MCPTT ID of the targeted MCPTT user (himself or other). The Expires header is set to its maximum value.

That subscription is forwarded to the MCPTT Controlling server.

Once the subscription is confirmed the originating participating MCPTT server will create SIP NOTIFY requests based on the information received from the MCPTT Controlling server according to ETSI TS 124 229 [3], IETF RFC 3856 [16], and IETF RFC 6665 [19] containing an application/pidf+xml MIME body indicating per-user affiliation information.

Message Sequence Diagram

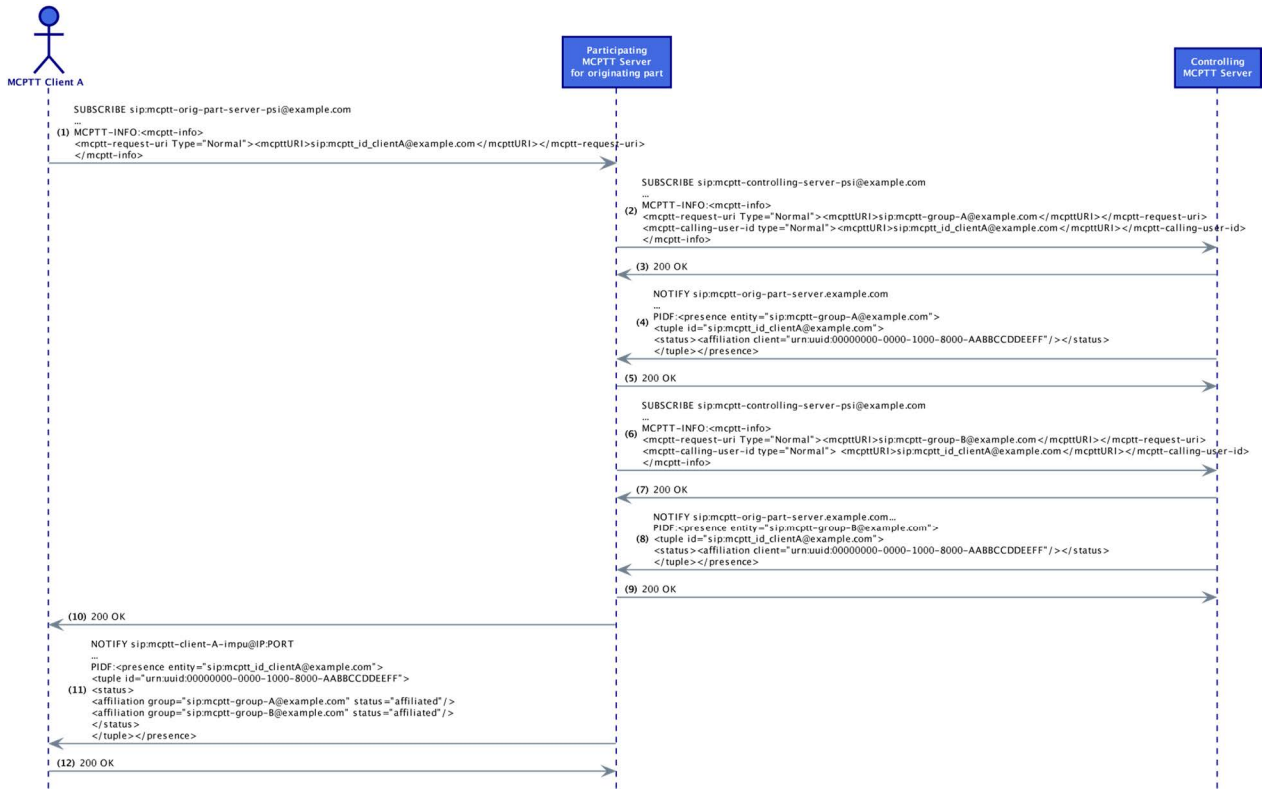

Figure 46: AFFIL/DET/01 Message Sequence

Message Details

```
[1] SUBSCRIBE MCPTT Caller/UE --> MCPTT Participating

SUBSCRIBE sip:mcptt-orig-part-server-psi@example.com SIP/2.0
From: <sip:mcptt-client-A-impu@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>
Expires: 4294967295
Accept: application/pidf+xml
Event: presence
Allow-Events: presence
Content-Type: application/vnd.3gpp.mcptt-info+xml
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
```

```
<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>
```

[2] SUBSCRIBE MCPTT Participating --> MCPTT Controlling

```
SUBSCRIBE sip:mcptt-controlling-server-psi@example.com SIP/2.0
From: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-controlling-server-psi@example.com>
Expires: 4294967295
Accept: application/pidf+xml
Event: presence
Allow-Events: presence
Content-Type: application/vnd.3gpp.mcptt-info+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>
```

[4] NOTIFY MCPTT Controlling --> MCPTT Participating

```
NOTIFY sip:mcptt-orig-part-server.example.com SIP/2.0
From: <sip:mcptt-controlling-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
Subscription-State: active;expires=...
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-controlling-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt-group-A@example.com">
  <tuple id="sip:mcptt_id_clientA@example.com">
    <status>
      <mcpttPI10:affiliation client="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF" expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
```

[11] NOTIFY MCPTT Participating --> MCPTT Caller/UE

```
NOTIFY sip:mcptt-client-A-impu@[IP]:[PORT] SIP/2.0
From: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-client-A-impu@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
Subscription-State: active;expires=...
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-orig-part-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt_id_clientA@example.com">
  <tuple id="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF">
    <status>
      <mcpttPI10:affiliation group="sip:mcptt-group-A@example.com" status="affiliated"
expires="..."/>
```

```
      <mcpttPI10:affiliation group="sip:mcptt-group-B@example.com" status="affiliated"
expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
```

Interoperability Test Description

Table 49: AFFIL/DET/01

Interoperability Test Description			
Identifier	AFFIL/DET/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and proper affiliation information retrieval		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AFFIL (clause 6.2) • MCPTT-Part_AFFIL (clause 6.5) • MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) sends an affiliation subscription (SIP SUBSCRIBE) request to its MCPTT originating participating server
	2	stimulus	The MCPTT originating participating server forwards the SUBSCRIBE to the controlling
	3	stimulus	The MCPTT controlling server sends a NOTIFY related to the subscription to the participating
	4	check	Affiliation information is correctly received at the MCPTT Client upon proper NOTIFY forwarding by its participating

7.7.2 MCPTT User subscribes to the affiliation of another user [AFFIL/DET/02]

The procedures are the same as in clause 7.7.1 but including the mcptt_id of the targeted user in the <mcptt-request-uri> element of the mcptt-info body in the SIP SUBSCRIBE. Furthermore the affiliation information shall be requested from the MCPTT participating server of the targeted user.

Message Sequence Diagram

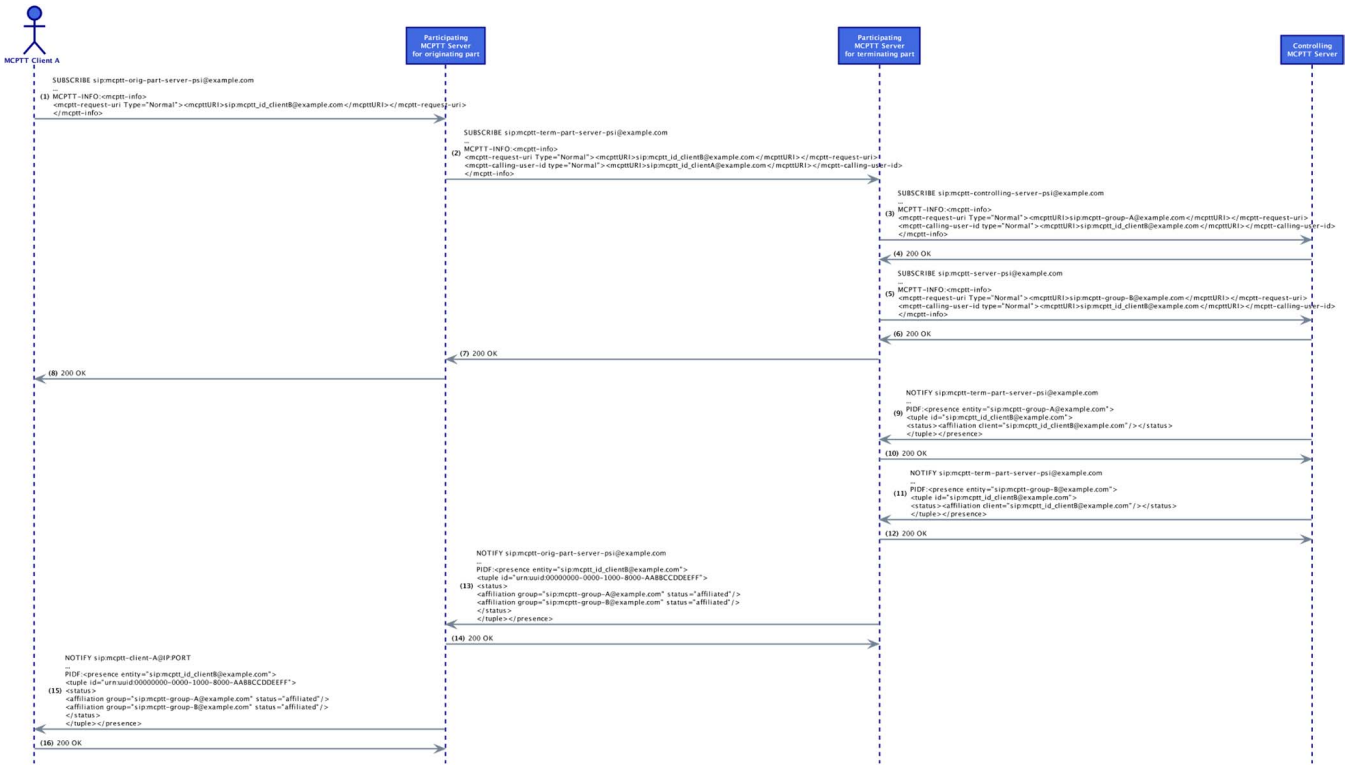

Figure 47: AFFIL/DET/02 Message Sequence

Message Details

```
[1] SUBSCRIBE MCPTT Caller/UE --> MCPTT Orig Participating

SUBSCRIBE sip:mcptt-orig-part-server-psi@example.com SIP/2.0
From: <sip:mcptt-client-A-impu@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>
Expires: 4294967295
Accept: application/pidf+xml
Event: presence
Allow-Events: presence
Content-Type: application/vnd.3gpp.mcptt-info+xml
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>


[2] SUBSCRIBE MCPTT Originating Participating --> MCPTT Terminating Participating

SUBSCRIBE sip:mcptt-term-part-server-psi@example.com SIP/2.0
From: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-term-part-server-psi@example.com>
Expires: 4294967295
Accept: application/pidf+xml
Event: presence
Allow-Events: presence
Content-Type: application/vnd.3gpp.mcptt-info+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-orig-part-server-psi@example.com>
```

```
<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>
```

[3] SUBSCRIBE MCPTT Term Participating --> MCPTT Controlling

```
SUBSCRIBE sip:mcptt-controlling-server-psi@example.com SIP/2.0
From: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-controlling-server-psi@example.com>
Expires: 4294967295
Accept: application/pidf+xml
Event: presence
Allow-Events: presence
Content-Type: application/vnd.3gpp.mcptt-info+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-term-part-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>
```

[9] NOTIFY MCPTT Controlling --> MCPTT Terminating Participating

```
NOTIFY sip:mcptt-term-part-server.example.com SIP/2.0
From: <sip:mcptt-controlling-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
Subscription-State: active;expires=...
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-controlling-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt-group-A@example.com">
  <tuple id="sip:mcptt_id_clientB@example.com">
    <status>
      <mcpttPI10:affiliation client="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF" expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
```

[13] NOTIFY MCPTT Terminating Participating --> MCPTT Originating Participating

```
NOTIFY mcptt-orig-part-server.example.com SIP/2.0
From: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
Subscription-State: active;expires=...
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-term-part-server-psi@example.com>
```

```
<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt_id_clientB@example.com">
  <tuple id="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF">
    <status>
      <mcpttPI10:affiliation group="sip:mcptt-group-A@example.com" status="affiliated"
expires="..."/>
      <mcpttPI10:affiliation group="sip:mcptt-group-B@example.com" status="affiliated"
expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
```

Interoperability Test Description

Table 50: AFFIL/DET/02

Interoperability Test Description			
Identifier	AFFIL/DET/02		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and proper affiliation information retrieval		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AFFIL (clause 6.2) • MCPTT-Part_AFFIL (clause 6.5) • MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) sends an affiliation subscription (SIP SUBSCRIBE) request to its MCPTT originating participating server with the targeted user's mcptt_id (mcptt_id_clientA@example.com) in the <mcpttrequest-uri> element
	2	stimulus	The MCPTT originating participating server forwards the SUBSCRIBE to the controlling
	3	stimulus	The MCPTT controlling forwards the SUBSCRIBE to the targeted user (terminating) participating server
	4	stimulus	The terminating MCPTT participating server updates the affiliation status by sending "n" NOTIFY(es) to the controlling
	5	stimulus	The MCPTT controlling server sends a NOTIFY related to the subscription to the participating
	6	check	Affiliation information is correctly received at the MCPTT Client upon proper NOTIFY forwarding by its participating

7.7.3 MCPTT User requests its affiliation to a set of groups [AFFIL/CHANGE/01]

The MCPTT Client submits an affiliation status change triggered by the MCPTT User itself (clauses 9.2.1.2 and 9.2.2.2.3 in ETSI TS 124 379 [4]).

In order to do so it shall create a SIP PUBLISH request including both an mcptt-info MIME body with the targeted mcptt_id and an application/pidf+xml MIME body indicating per-user affiliation information.

To refresh the affiliation subscription information different Expires header values shall be used following IETF RFC 3903 [17]: 4294967295 if the targeted MCPTT user is interested in at least one MCPTT group at the targeted MCPTT client or 0 if the targeted MCPTT user is no longer interested in any MCPTT group at the targeted MCPTT client.

The participating server shall inform the client about the status of the affiliation change request (e.g. affiliating or affiliated) with NOTIFY messages which contain per-user affiliation status information.

Message Sequence Diagram

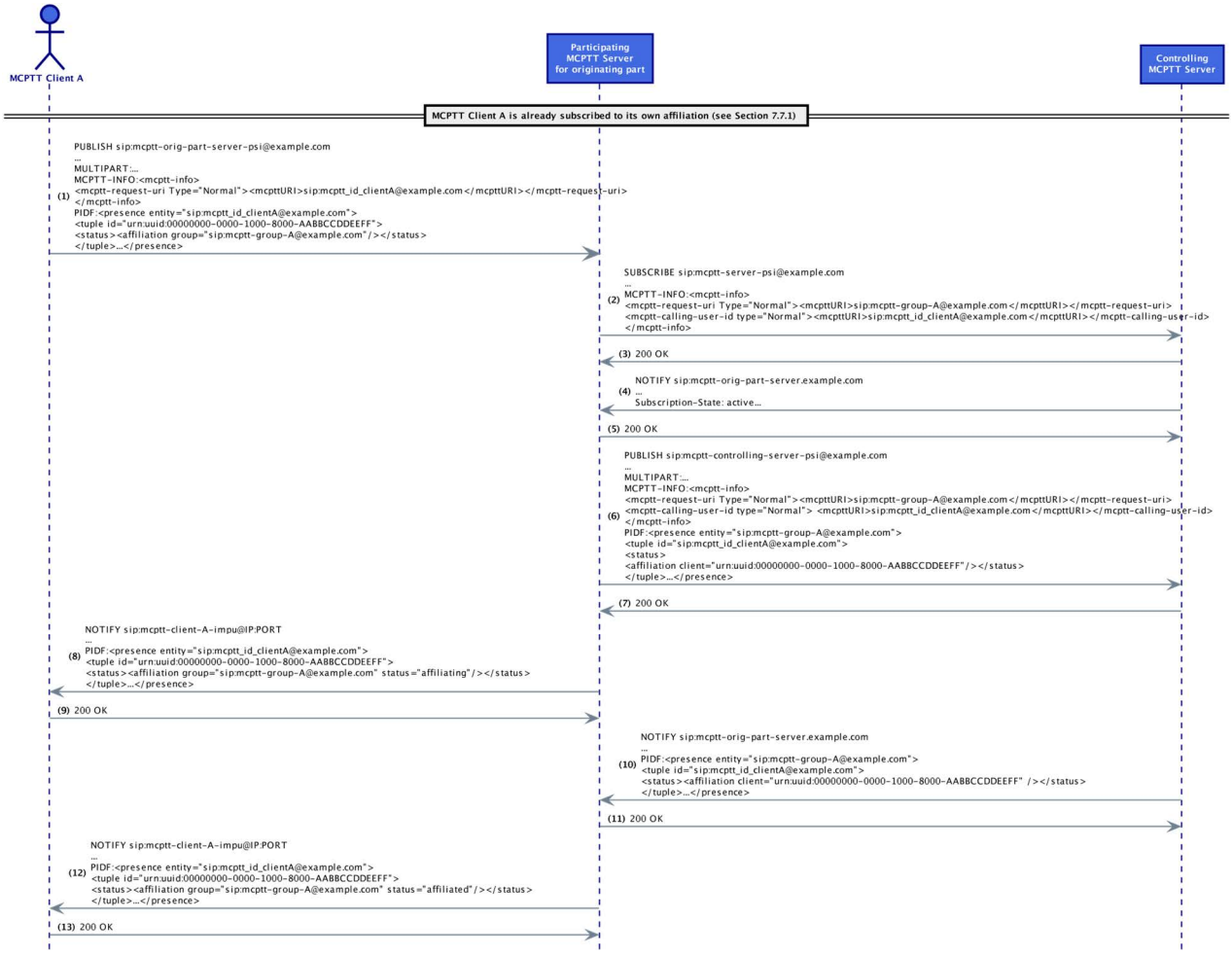

Figure 48: AFFIL/CHANGE/01 Message Sequence

Message Details

```
[1] PUBLISH MCPTT Caller/UE --> MCPTT Participating

PUBLISH sip:mcptt-orig-part-server-psi@example.com SIP/2.0
From: <sip:mcptt-client-A-impu@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>
Contact: <sip:mcptt-client-A-impu@[IP]:[PORT]>
Expires: 4294967295
Content-Type: multipart/mixed;boundary=[boundary]
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
Event: presence

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
```

```
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/pidf+xml

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0"
entity="sip:mcptt_id_clientA@example.com">
  <tuple id="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF">
    <status>
      <mcpttPI10:affiliation group="sip:mcptt-group-A@example.com"/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
--[boundary]--


[2] SUBSCRIBE MCPTT Participating --> MCPTT Controlling

SUBSCRIBE sip:mcptt-controlling-server-psi@example.com SIP/2.0
From: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-controlling-server-psi@example.com>
Expires: 4294967295
Accept: application/pidf+xml
Event: presence
Allow-Events: presence
Content-Type: application/vnd.3gpp.mcptt-info+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-orig-part-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>


[6] PUBLISH MCPTT Participating --> MCPTT Controlling

PUBLISH sip:mcptt-controlling-server-psi@example.com SIP/2.0
From: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-controlling-server-psi@example.com>
Expires: 4294967295
Accept: application/pidf+xml
Event: presence
Content-Type: multipart/mixed;boundary=[boundary]
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-orig-part-server-psi@example.com>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/pidf+xml

<?xml version="1.0" encoding="UTF-8"?>
```

```
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt-group-A@example.com">
  <tuple id="sip:mcptt_id_clientA@example.com">
    <status>
      <mcpttPI10:affiliation client="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF"/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>

--[boundary]--
```

[8] NOTIFY MCPTT Participating --> MCPTT Caller/UE

```
NOTIFY sip:mcptt-client-A-impu@[IP]:[PORT] SIP/2.0
From: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-client-A-impu@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
Subscription-State: active;expires=...
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-orig-part-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt_id_clientA@example.com">
  <tuple id="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF">
    <status>
      <mcpttPI10:affiliation group="sip:mcptt-group-A@example.com" status="affiliating"
expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
```

[10] NOTIFY MCPTT Controlling --> MCPTT Participating

```
NOTIFY sip:mcptt-orig-part-server.example.com SIP/2.0
From: <sip:mcptt-controlling-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
Subscription-State: active;expires=3600
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-controlling-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt-group-A@example.com">
  <tuple id="sip:mcptt_id_clientA@example.com">
    <status>
      <mcpttPI10:affiliation client="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF" expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
```

[12] NOTIFY MCPTT Participating --> MCPTT Caller/UE

```
NOTIFY sip:mcptt-client-A-impu@[IP]:[PORT] SIP/2.0
From: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-client-A-impu@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
Subscription-State: active;expires=...
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-orig-part-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt_id_clientA@example.com">
  <tuple id="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF">
```

```
    <status>
      <mcpttPI10:affiliation group="sip:mcptt-group-A@example.com" status="affiliated"
expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
```

Interoperability Test Description

Table 51: AFFIL/CHANGE/01

Interoperability Test Description			
Identifier	AFFIL/CHANGE/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and affiliation status properly changed		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AFFIL (clause 6.2) • MCPTT-Part_AFFIL (clause 6.5) • MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) sends an affiliation change (SIP PUBLISH) request to its MCPTT originating participating server with the targeted user's mcptt_id in the <mcptt-request-uri> field
	2	stimulus	The MCPTT originating participating server SUBSCRIBEs to the controlling for the request group
	3	stimulus	The MCPTT controlling server NOTIFYes user's current status
	4	stimulus	The MCPTT participating server PUBLISHes the new affiliation status to the request (and already) subscribed group
	5	stimulus	The MCPTT controlling server sends a NOTIFY related to the subscription to the participating
	6	check	Affiliation information is correctly received at the MCPTT Client upon proper NOTIFY forwarding by its participating

7.7.4 MCPTT User requests the affiliation of other User to a set of groups in mandatory mode[AFFIL/CHANGE/02]

The procedure is equivalent to that in clause 7.7.3 but using the proper targeted user's mcptt_id in the different requests.

The originating participant server shall forward the PUBLISH to the participating server serving the targeted user.

In mandatory mode, no confirmation of the user is requested. It will be informed of the affiliation changes with NOTIFY requests by its participating server if subscribed to this event.

It is assumed that MCPTT Client A is subscribed to the affiliation information of MCPTT Client B as described in clause 7.7.2 and that MCPTT Client B is subscribed to its own affiliation as described in clause 7.7.1 in the procedures included here.

Message Sequence Diagram

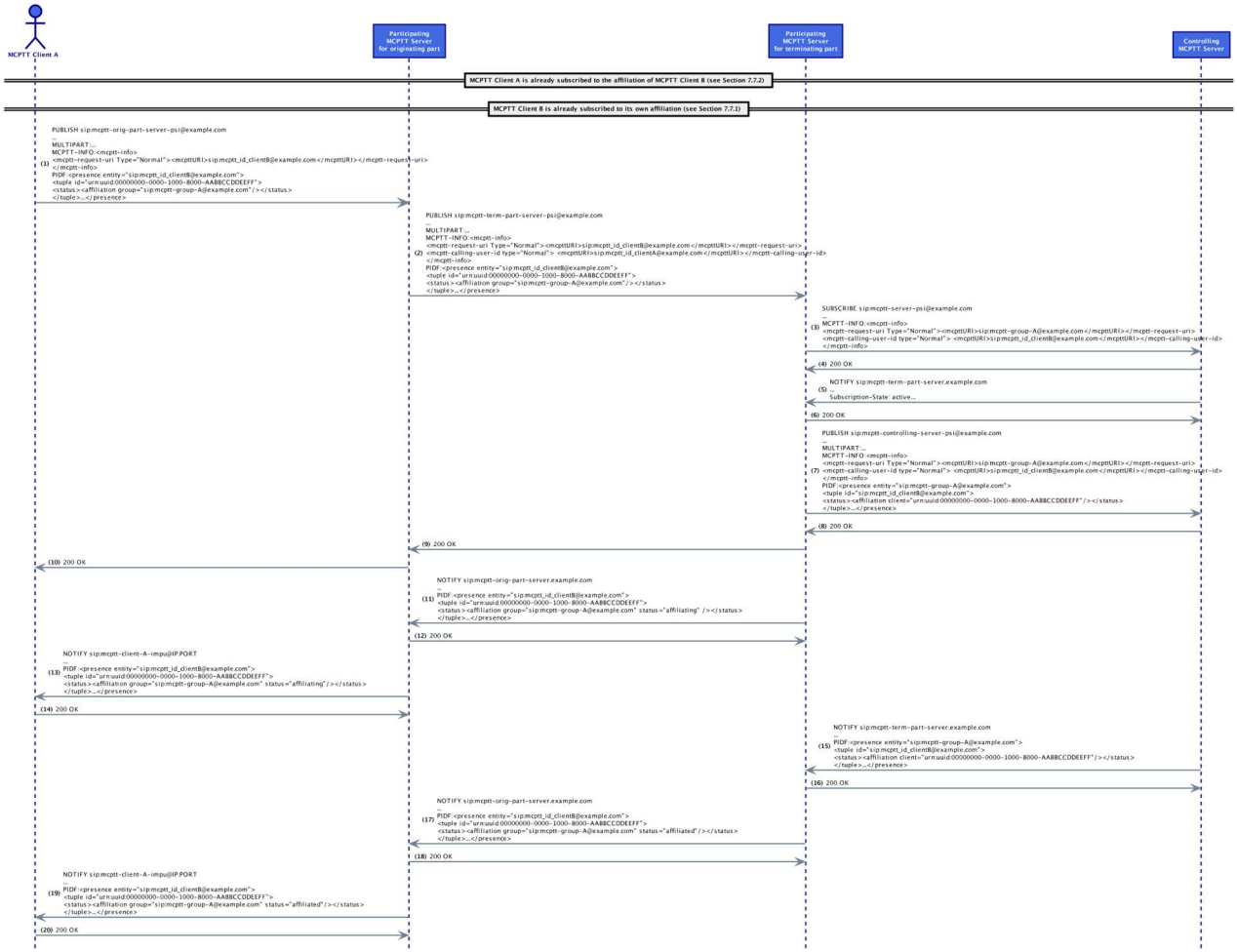

Figure 49: AFFIL/CHANGE/02 Message Sequence

Message Details

```
[1] PUBLISH MCPTT Caller/UE --> MCPTT Originating Participating

PUBLISH sip:mcptt-orig-part-server-psi@example.com SIP/2.0
From: <sip:mcptt-client-A-impu@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>
Expires: 4294967295
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
Event: presence
Content-Type: multipart/mixed;boundary=[boundary]

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/pidf+xml

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0"
entity="sip:mcptt_id_clientB@example.com">
```

```
  <tuple id="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF">
    <status>
      <mcpttPI10:affiliation group="sip:mcptt-group-A@example.com"/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
--[boundary]--
```

[2] PUBLISH MCPTT Originating Participating --> MCPTT Terminating Participating

```
PUBLISH sip:mcptt-orig-part-server-psi@example.com SIP/2.0
From: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-term-part-server-psi@example.com>
Call-ID: [call_id_publish_y]
CSeq: [cseq] PUBLISH
Expires: 4294967295
Content-Type: multipart/mixed;boundary=[boundary]
Event: presence
P-Asserted-Identity: <sip:mcptt-term-part-server-psi@example.com>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/pidf+xml

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0"
entity="sip:mcptt_id_clientB@example.com">
  <tuple id="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF">
    <status>
      <mcpttPI10:affiliation group="sip:mcptt-group-A@example.com"/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
--[boundary]--
```

[3] SUBSCRIBE MCPTT Terminating Participating --> MCPTT Controlling

```
SUBSCRIBE sip:mcptt-controlling-server-psi@example.com SIP/2.0
From: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-controlling-server-psi@example.com>
Call-ID: [call_id_subscribe_z]
CSeq: [cseq] SUBSCRIBE
Expires: 4294967295
Accept: application/pidf+xml
Event: presence
Allow-Events: presence
Content-Type: application/vnd.3gpp.mcptt-info+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>
```

```
[7] PUBLISH MCPTT Terminating Participating --> MCPTT Controlling

PUBLISH sip:mcptt-controlling-server-psi@example.com SIP/2.0
From: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-controlling-server-psi@example.com>
Expires: 4294967295
Accept: application/pidf+xml
Event: presence
Content-Type: multipart/mixed;boundary=[boundary]
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-term-part-server-psi@example.com>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/pidf+xml

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt-group-A@example.com">
  <tuple id="sip:mcptt_id_clientB@example.com">
    <status>
      <mcpttPI10:affiliation client="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF"/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>

--[boundary]--


[11] NOTIFY MCPTT Terminating Participating --> MCPTT Originating Participating

NOTIFY sip:mcptt-orig-part-server.example.com SIP/2.0
From: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
Subscription-State: active;expires=...
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-term-part-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt_id_clientB@example.com">
  <tuple id="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF">
    <status>
      <mcpttPI10:affiliation group="sip:mcptt-group-A@example.com" status="affiliating"
expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>


[15] NOTIFY MCPTT Controlling --> MCPTT Terminating Participating

NOTIFY sip:mcptt-term-part-server.example.com SIP/2.0
From: <sip:mcptt-controlling-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
```

```
Subscription-State: active;expires=...
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-controlling-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt-group-A@example.com">
  <tuple id="sip:mcptt_id_clientB@example.com">
    <status>
      <mcpttPI10:affiliation client="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF" expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>


[17] NOTIFY MCPTT Terminating Participating --> MCPTT Originating Participating

NOTIFY sip:mcptt-orig-part-server.example.com SIP/2.0
From: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
Subscription-State: active;expires=...
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-term-part-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt_id_clientB@example.com">
  <tuple id="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF">
    <status>
      <mcpttPI10:affiliation group="sip:mcptt-group-A@example.com" status="affiliated"
expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
```

Interoperability Test Description

Table 52: AFFIL/CHANGE/02

Interoperability Test Description			
Identifier	AFFIL/CHANGE/02		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and proper affiliation information change		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AFFIL (clause 6.2) • MCPTT-Part_AFFIL (clause 6.5) • MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) sends an affiliation change (SIP PUBLISH) request to its MCPTT originating participating server with the targeted user's mcptt_id (mcptt_id_clientB@example.com) in the <mcpttrequest-uri> element of the mcptt-info body
	2	stimulus	The MCPTT originating participating server forwards the PUBLISH to the controlling
	3	stimulus	The MCPTT controlling SUBSCRIBEs to the targeted user (terminating) participating server
	4	stimulus	The MCPTT controlling sends the PUBLISH to the targeted user (terminating) participating server
	5	stimulus	The terminating MCPTT participating server acknowledges the affiliation request and later updates the affiliation status by sending "n" NOTIFY(es) to the controlling
	6	stimulus	The MCPTT controlling server sends "n"+1 NOTIFY related to the subscription to the participating
	7	check	Affiliation information is correctly received at the MCPTT Client upon proper NOTIFY forwarding by its participating

7.7.5 MCPTT User requests the affiliation of other User to a set of groups in negotiated mode [AFFIL/CHANGE/03]

When a user wants to affiliate another user to a certain group in negotiated mode, it shall send a SIP MESSAGE request with application/vnd.3gpp.mcptt-affiliation-command+xml content indicating the groups the target user shall affiliate to or de-affiliate from.

The originating participant server shall forward the MESSAGE request to the participating server serving the targeted user.

In negotiated mode, a confirmation of the user concerning the new affiliation modifications is requested. In fact, it will need to affiliate itself using the procedures described in clause 7.7.3.

It is assumed that MCPTT Client A is subscribed to the affiliation information of MCPTT Client B as described in clause 7.7.2 and that MCPTT Client B is subscribed to its own affiliation as described in clause 7.7.1 in the procedures included here.

Message Sequence Diagram

Figure 50: AFFIL/CHANGE/03 Message Sequence

Message Details

```
[1] MESSAGE Caller/UE --> MCPTT Originating Participating

MESSAGE sip:mcptt-orig-part-server-psi@example.com SIP/2.0
From: <sip:mcptt-client-A-impu@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>
Contact: <sip:mcptt-client-A-impu@[IP]:[PORT]>
Content-Type: multipart/mixed;boundary=[boundary]
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
```

```
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-affiliation-command+xml

<?xml version="1.0" encoding="UTF-8"?>
<command-list xmlns="urn:3gpp:ns:affiliationCommand:1.0">
  <affiliate>
    <group>sip:mcptt-group-A@example.com</group>
  </affiliate>
</command-list>
--[boundary]
```

[3] MESSAGE MCPTT Originating Participating --> MCPTT Terminating Participating

```
MESSAGE sip:mcptt-term-part-server-psi@example.com SIP/2.0
From: <sip:mcptt-orig-part-server-psi@example.com>;tag=7NjKUZ7538pHe
To: <sip:mcptt-term-part-server-psi@example.com>
Content-Type: multipart/mixed;boundary=[boundary]
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-orig-part-server-psi@example.com>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-affiliation-command+xml

<?xml version="1.0" encoding="UTF-8"?>
<command-list xmlns="urn:3gpp:ns:affiliationCommand:1.0">
  <affiliate>
    <group>sip:mcptt-group-A@example.com</group>
  </affiliate>
</command-list>
--[boundary]--
```

[5] MESSAGE MCPTT Terminating Participating --> MCPTT Client B / UE

```
MESSAGE sip:mcptt-client-B-impu@example.com SIP/2.0
From: <sip:mcptt-term-part-server-psi@example.com>;tag=7NjKUZ7538pHe
To: <sip:mcptt-client-B-impu@example.com>
Content-Type: multipart/mixed;boundary=[boundary]
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-term-part-server-psi@example.com>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
```

```
Content-Type: application/vnd.3gpp.mcptt-affiliation-command+xml

<?xml version="1.0" encoding="UTF-8"?>
<command-list xmlns="urn:3gpp:ns:affiliationCommand:1.0">
  <affiliate>
    <group>sip:mcptt-group-A@example.com</group>
  </affiliate>
</command-list>
--[boundary]


[7] PUBLISH Client B / UE --> MCPTT Terminating Participating

PUBLISH sip:mcptt-term-part-server-psi@example.com SIP/2.0
From: <sip:mcptt-client-B-impu@example.com>;tag=[tag]
To: <sip:mcptt-term-part-server-psi@example.com>
Contact: <sip:mcptt-client-B-impu@[IP]:[PORT]>
Expires: 4294967295
Content-Type: multipart/mixed;boundary=[boundary]
P-Preferred-Identity: <sip:mcptt-client-B-impu@example.com>
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
Event: presence

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/pidf+xml

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0"
entity="sip:mcptt_id_clientB@example.com">
  <tuple id="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF">
    <status>
      <mcpttPI10:affiliation group="sip:mcptt-group-A@example.com"/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
--[boundary]


[8] SUBSCRIBE MCPTT Terminating Participating --> MCPTT Controlling

SUBSCRIBE sip:mcptt-controlling-server-psi@example.com SIP/2.0
From: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-controlling-server-psi@example.com>
Call-ID: [call_id_subscribe_z]
CSeq: [cseq] SUBSCRIBE
Expires: 4294967295
Accept: application/pidf+xml
Event: presence
Allow-Events: presence
Content-Type: application/vnd.3gpp.mcptt-info+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>
```

```
[12] PUBLISH MCPTT Terminating Participating --> MCPTT Controlling

PUBLISH sip:mcptt-controlling-server-psi@example.com SIP/2.0
From: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-controlling-server-psi@example.com>
Call-ID: [call_id_publish_y]
CSeq: [cseq] PUBLISH
Expires: 4294967295
Accept: application/pidf+xml
Event: presence
Content-Type: multipart/mixed;boundary=[boundary]
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-term-part-server-psi@example.com>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
    </mcptt-request-uri>
    <mcptt-calling-user-id type="Normal">
      <mcpttURI>sip:mcptt_id_clientB@example.com</mcpttURI>
    </mcptt-calling-user-id>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/pidf+xml

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt-group-A@example.com">
  <tuple id="sip:mcptt_id_clientB@example.com">
    <status>
      <mcpttPI10:affiliation client="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF"/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>

--[boundary]


[16] NOTIFY MCPTT Terminating Participating --> MCPTT Originating Participating

NOTIFY sip:mcptt-orig-part-server.example.com SIP/2.0
From: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
Subscription-State: active;expires=...
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-term-part-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt_id_clientB@example.com">
  <tuple id="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF">
    <status>
      <mcpttPI10:affiliation group="sip:mcptt-group-A@example.com" status="affiliating"
expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>


[20] NOTIFY MCPTT Controlling --> MCPTT Terminating Participating

NOTIFY sip:mcptt-term-part-server.example.com SIP/2.0
From: <sip:mcptt-controlling-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
```

```
Subscription-State: active;expires=...
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-controlling-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt-group-A@example.com">
  <tuple id="sip:mcptt_id_clientB@example.com">
    <status>
      <mcpttPI10:affiliation client="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF" expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>


[24] NOTIFY MCPTT Terminating Participating --> MCPTT Originating Participating

NOTIFY sip:mcptt-orig-part-server.example.com SIP/2.0
From: <sip:mcptt-term-part-server-psi@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>;tag=[tag]
Event: presence
Allow-Events: presence
Subscription-State: active;expires=...
Content-Type: application/pidf+xml
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-term-part-server-psi@example.com>

<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:mcpttPI10="urn:3gpp:ns:mcpttPresInfo:1.0" entity="sip:mcptt_id_clientB@example.com">
  <tuple id="urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF">
    <status>
      <mcpttPI10:affiliation group="sip:mcptt-group-A@example.com" status="affiliated"
expires="..."/>
    </status>
  </tuple>
  <mcpttPI10:p-id>[P-ID]</mcpttPI10:p-id>
</presence>
```

Interoperability Test Description

Table 53: AFFIL/CHANGE/03

Interoperability Test Description			
Identifier	AFFIL/CHANGE/03		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and proper affiliation information change on behalf of other user on negotiated mode		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AFFIL (clause 6.2) • MCPTT-Part_AFFIL (clause 6.5) • MCPTT-Ctrl_AFFIL (clause 6.6)		
Pre-test conditions	• Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) sends an affiliation change of another user in negotiated mode by creating and submitting a SIP MESSAGE request with proper format to its participating
	2	stimulus	The MCPTT originating participating server forwards the MESSAGE to the terminating participating of the targeted user
	3	stimulus	The MCPTT terminating participating forwards the MESSAGE to the targeted user, which acknowledges and PUBLISHes its new affiliation
	4	stimulus	The MCPTT terminating participating sends a SUBSCRIBE if needed and PUBLISHes the new affiliation to the controlling
	5	stimulus	The MCPTT controlling sends the NOTIFY back to both the targeted user and the originating one through its participating-
	6	check	Affiliation information is correctly changed and notified to both requester and targeted users

7.8 Location (LOC)

7.8.1 MCPTT Client Configuration upon 3rd party register [LOC/3PRTYREG/CONFIG/01]

Upon a successful IMS registration and 3rd party REGISTER arriving at the Participating a new Location Reporting Configuration message shall be created following the procedures in clause 13.2.2 in ETSI TS 124 379 [4].

Message Sequence Diagram

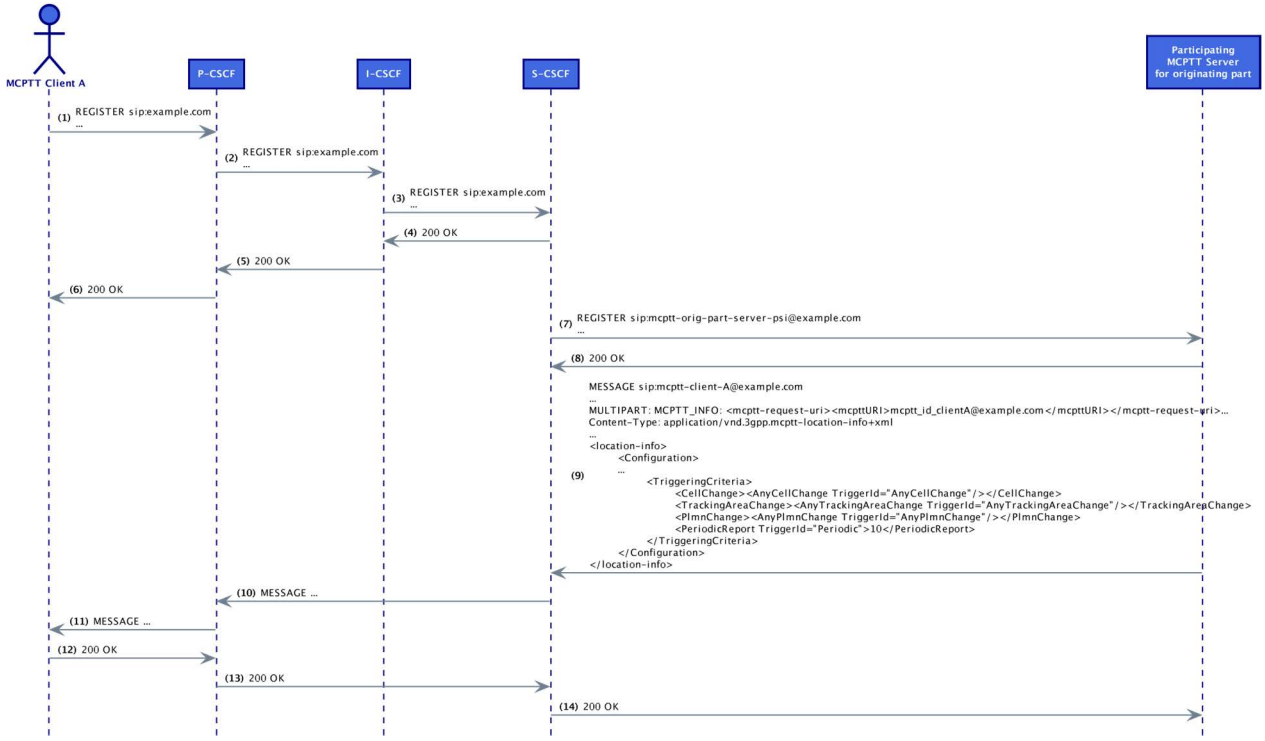

Figure 51: LOC/3PRTYREG/CONFIG/01 Message Sequence

Message Details

```
[9] MESSAGE MCPTT Participating --> UE

MESSAGE sip:mcptt-client-A-impu@example.com SIP/2.0
...
Content-Type: multipart/mixed;boundary=[boundary]
...
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-orig-part-server-psi@example.com>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-location-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<location-info xmlns="urn:3gpp:ns:mcpttLocationInfo:1.0">
  <Configuration>
    <NonEmergencyLocationInformation>
      <ServingEcgi/>
      <NeighbouringEcgi/>
      <NeighbouringEcgi/>
      <NeighbouringEcgi/>
      <MbmsSaId/>
      <MbsfnArea/>
      <GeographicalCoordinate/>
      <minimumIntervalLength>5</minimumIntervalLength>
    </NonEmergencyLocationInformation>
    <TriggeringCriteria>
      <CellChange>
```

```
        <AnyCellChange TriggerId="AnyCellChange"/>
      </CellChange>
      <TrackingAreaChange>
        <AnyTrackingAreaChange TriggerId="AnyTrackingAreaChange"/>
      </TrackingAreaChange>
      <PlmnChange>
        <AnyPlmnChange TriggerId="AnyPlmnChange"/>
      </PlmnChange>
      <PeriodicReport TriggerId="Periodic">10</PeriodicReport>
    </TriggeringCriteria>
  </Configuration>
</location-info>

--[boundary]--
```

Interoperability Test Description

Table 54: LOC/3PRTYREG/CONFIG/01

Interoperability Test Description			
Identifier	LOC/3PRTYREG/CONFIG/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and configuration of location reporting mechanism		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_LOC • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_REGAUTH, MCPTT-Part_LOC (clause 6.5)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) registers to IMS/MCPTT
	2	check	Participating sending location reporting configuration MESSAGE to the MCPTT Client
	3	verify	Location (including different triggers) properly configured in the MCPTT Client

7.8.2 Explicit Location reporting request sent to the MCPTT Client [LOC/REQUEST/01]

The participating MCPTT function may request the MCPTT client to report its location. In that case, the participating MCPTT functions shall generate a SIP MESSAGE request in accordance as described in clause 13.2.3 in ETSI TS 124 379 [4]. Upon its reception, the MCPTT Client shall send a location report as specified in clause 13.3.4 in ETSI TS 124 379 [4]; and reset the reporting timer.

Message Sequence Diagram

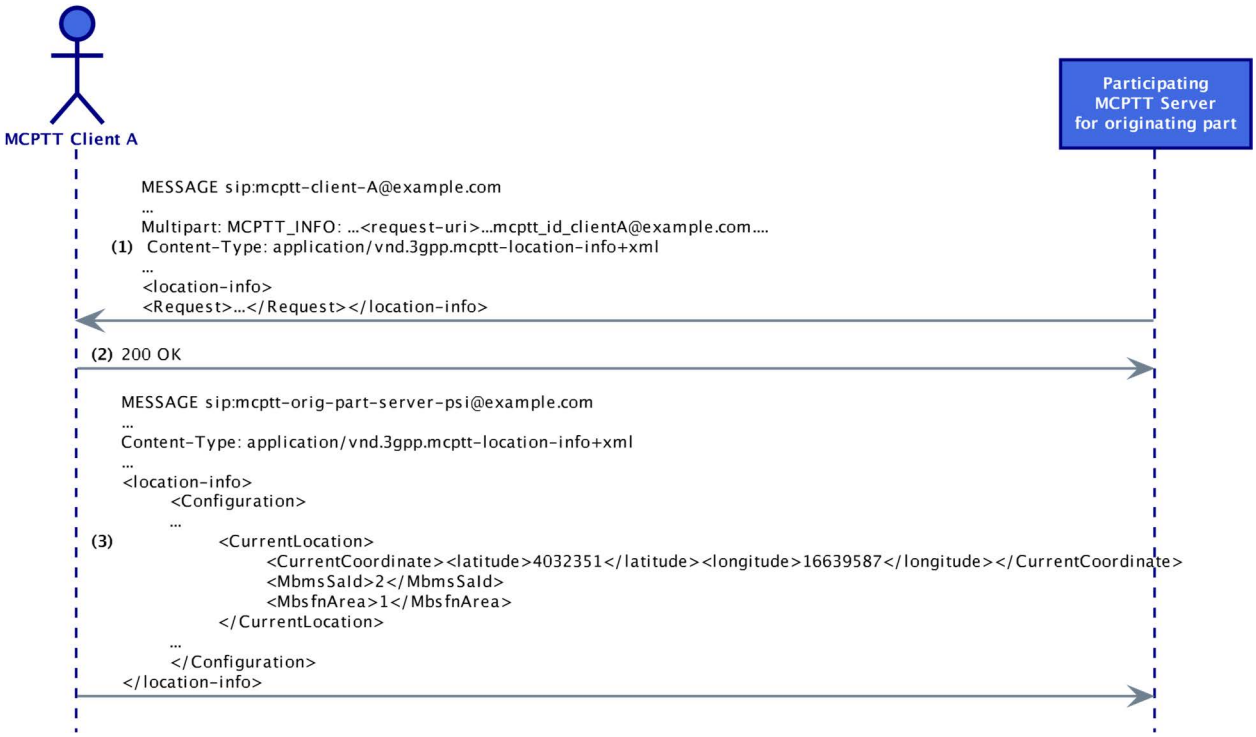

Figure 52: LOC/REQUEST/01 Message Sequence

Message Details

```
[1] MESSAGE MCPTT Participating --> MCPTT Client

MESSAGE sip:mcptt-client-A-impu@example.com SIP/2.0
...
Content-Type: multipart/mixed;boundary=[boundary]
...
P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.mcptt
P-Asserted-Identity: <sip:mcptt-orig-part-server-psi@example.com>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<mcpttinfo xmlns="urn:3gpp:ns:mcpttInfo:1.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <mcptt-Params>
    <mcptt-request-uri type="Normal">
      <mcpttURI>sip:mcptt_id_clientA@example.com</mcpttURI>
    </mcptt-request-uri>
  </mcptt-Params>
</mcpttinfo>

--[boundary]
Content-Type: application/vnd.3gpp.mcptt-location-info+xml

<?xml version="1.0" encoding="UTF-8"?>
<location-info xmlns="urn:3gpp:ns:mcpttLocationInfo:1.0">
  <Request RequestId="7dda64d1-5830-1235-3f95-525400f2984b"/>
</location-info>
--[boundary]--

[3] MESSAGE MCPTT Client --> MCPTT Participating

MESSAGE sip:mcptt-orig-part-server-psi@example.com SIP/2.0
From: <sip:mcptt-client-A-impu@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>
CSeq: [cseq] MESSAGE
Content-Type: application/vnd.3gpp.mcptt-location-info+xml
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
...
```

```
<?xml version="1.0" encoding="UTF-8"?>
<location-info xmlns="urn:3gpp:ns:mcpttLocationInfo:1.0">
  <Report ReportType="NonEmergency" ReportID="7dda64d1-5830-1235-3f95-525400f2984b">
    <CurrentLocation>
      <MbmsSaId type="Normal">
        <SaId>2</SaId>
      </MbmsSaId>
      <MbsfnArea type="Normal">
        <MbsfnAreaId>1</MbsfnAreaId>
      </MbsfnArea>
      <CurrentCoordinate>
        <longitude type="Normal">
          <threebytes>16639587</threebytes>
        </longitude>
        <latitude type="Normal">
          <threebytes>4032351</threebytes>
        </latitude>
      </CurrentCoordinate>
    </CurrentLocation>
  </Report>
</location-info>
```

Interoperability Test Description

Table 55: LOC/REQUEST/01

Interoperability Test Description			
Identifier	LOC/REQUEST/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and the procedures for requesting a location report		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_LOC • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_LOC (clause 6.5)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	Participating server needs MCPTT Client location report
	2	check	Participating sending location report request MES- SAGE to the MCPTT Client
	3	check	The MCPTT Client generates a report upon the reception of the request
	4	verify	Location properly requested to the MCPTT Client -and successfully transmitted to the Participating-

7.8.3 MCPTT Client Location submitted upon some trigger[LOC/SUBMISSION/01]

Upon some time/distance/multicast-area related trigger, the MCPTT Client generates a Location Report. Such Report shall be sent with a SIP MESSAGE request in accordance as described in clause 13.2.4 in ETSI TS 124 379 [4].

Message Sequence Diagram

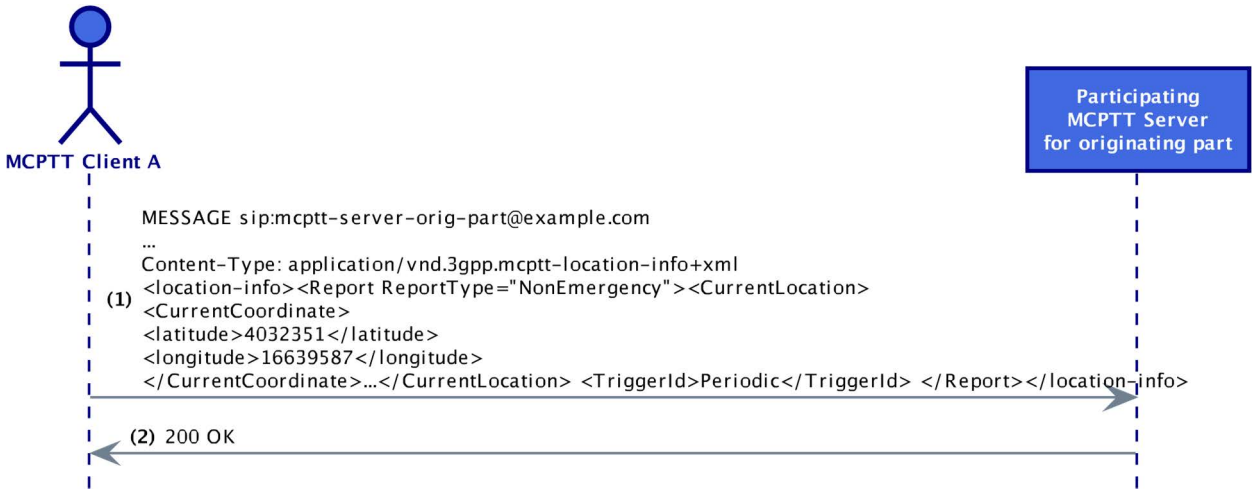

Figure 53: LOC/SUBMISSION/01 Message Sequence

Message Details

```
[1] MESSAGE UE --> MCPTT Participating

MESSAGE sip:mcptt-orig-part-server-psi@example.com SIP/2.0
From: <sip:mcptt-client-A-impu@example.com>;tag=[tag]
To: <sip:mcptt-orig-part-server-psi@example.com>
CSeq: [cseq] MESSAGE
Content-Type: application/vnd.3gpp.mcptt-location-info+xml
P-Preferred-Identity: <sip:mcptt-client-A-impu@example.com>
...

<?xml version="1.0" encoding="UTF-8"?>
<location-info xmlns="urn:3gpp:ns:mcpttLocationInfo:1.0">
  <Report ReportType="NonEmergency">
    <TriggerId>Periodic</TriggerId>
    <CurrentLocation>
      <MbmsSaId type="Normal">
        <SaId>2</SaId>
      </MbmsSaId>
      <MbsfnArea type="Normal">
        <MbsfnAreaId>1</MbsfnAreaId>
      </MbsfnArea>
      <CurrentCoordinate>
        <longitude type="Normal">
          <threebytes>16639587</threebytes>
        </longitude>
        <latitude type="Normal">
          <threebytes>4032351</threebytes>
        </latitude>
      </CurrentCoordinate>
    </CurrentLocation>
  </Report>
</location-info>
```

Interoperability Test Description

Table 56: LOC/SUBMISSION/01

Interoperability Test Description			
Identifier	LOC/SUBMISSION/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and the procedures for submitting a location report		
Configuration(s)	• CFG_ONN_OTT-1 (clause 5.2) • CFG_ONN_UNI-MC-LTE-1 (clause 5.3) • CFG_ONN_MULTI-MC-LTE-1 (clause 5.4)		
References	• SIP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4]) • MCPT (see ETSI TS 124 380 [5] and other references in ETSI TS 124 379 [4]) • RTP (see ETSI TS 124 229 [3] and other references in ETSI TS 124 379 [4])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_LOC • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTT-Part_LOC (clause 6.5)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • Proper configuration of the SIP core/IMS to forward the signalling to the specific controlling and participating servers • MCPTT Client Location reporting mechanism properly configured		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	Any of the Location triggers is activated
	2	check	The MCPTT Client generates a report upon the reception of the request
	3	check	The MCPTT Client sends a SIP MESSAGE with the report
	4	verify	Location properly received and decoded in the MCPTT participating server

Annex A (informative): Bibliography

- 3GPP TR 23.779 (V13.0.0): "Study on application architecture to support Mission Critical Push To Talk over LTE (MCPTT) services, Release 13, Version 13.0.0", September 2015.
- ETSI TR 124 980 (V13.0.1): "LTE; Minimum Requirements for support of MCPTT Service over the Gm reference point (3GPP TR 24.980 version 13.0.1 Release 13)".
- 3GPP TR 26.879 (V13.0.0): "Mission Critical Push To Talk (MCPTT); Media, codecs and Multimedia Broadcast/Multicast Service (MBMS) enhancements for MCPTT over LTE, Release 13, Version 13.0.0", March 2016.
- ETSI TS 123 468 (V13.3.0): "LTE; Group Communication System Enablers for LTE (GCSE_LTE); Stage 2 (3GPP TS 23.468 version 13.3.0 Release 13)".

History

Document history		
V1.1.1	October 2017	Publication