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Plugtests™ scenarios
for Mission Critical Services

Reference
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ETSI

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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).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

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/.

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 necessary for the application of the present document.

[1] ETSI TS 122 179 (V14.3.0): "Universal Mobile Telecommunications System (UMTS); LTE; Mission Critical Push to Talk (MCPTT) over LTE; Stage 1 (3GPP TS 22.179 version 14.3.0 Release 14)".

[2] ETSI TS 123 280 (V14.4.0): "LTE; Common functional architecture to support mission critical services; Stage 2 (3GPP TS 23.280 version 14.4.0 Release 14)".

[3] ETSI TS 123 281 (V14.4.0): "LTE; Functional architecture and information flows to support Mission Critical Video (MCVideo); Stage 2 (3GPP TS 23.281 version 14.4.0 Release 14)".

[4] ETSI TS 123 379 (V14.4.0): "LTE; Functional architecture and information flows to support Mission Critical Push To Talk (MCPTT); Stage 2 (3GPP TS 23.379 version 14.4.0 Release 14)".

[5] Void.

[6] ETSI TS 124 229 (V14.6.0): "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 14.6.0 Release 14)".

[7] ETSI TS 124 281 (V14.2.0): "LTE; Mission Critical Video (MCVideo) signalling control; Protocol specification (3GPP TS 24.281 version 14.2.0 Release 14)".

[8] ETSI TS 124 282 (V14.2.0): "LTE; Mission Critical Data (MCData) signalling control; Protocol specification (3GPP TS 24.282 version 14.2.0 Release 14)".

[9] ETSI TS 124 379 (V14.4.0): "LTE; Mission Critical Push To Talk (MCPTT) call control; Protocol specification (3GPP TS 24.379 version 14.4.0 Release 14)".

[10] ETSI TS 124 380 (V14.5.0): "LTE; Mission Critical Push To Talk (MCPTT) media plane control; Protocol specification (3GPP TS 24.380 version 14.5.0 Release 14)".

[11] ETSI TS 124 481 (V14.3.0): "LTE; Mission Critical Services (MCS) group management; Protocol specification (3GPP TS 24.481 version 14.3.0 Release 14)".

[12] ETSI TS 124 482 (V14.2.0): "LTE; Mission Critical Services (MCS) identity management; Protocol specification (3GPP TS 24.482 version 14.2.0 Release 14)".

[13] Void.

[14] ETSI TS 124 484 (V14.4.0): "LTE; Mission Critical Services (MCS) configuration management; Protocol specification (3GPP TS 24.484 version 14.4.0 Release 14)".

[15] ETSI TS 124 581 (V14.3.0): "LTE; Mission Critical Video (MCVideo) media plane control; Protocol specification (3GPP TS 24.581 version 14.3.0 Release 14)".

[16] Void.

[17] ETSI TS 124 582 (V14.2.0): "LTE; Mission Critical Data (MCData) media plane control; Protocol specification (3GPP TS 24.582 version 14.2.0 Release 14)".

[18] ETSI TS 126 179 (V14.0.0): "LTE; Mission Critical Push To Talk (MCPTT); Codecs and media handling (3GPP TS 26.179 version 14.0.0 Release 14)".

[19] ETSI TS 126 346 (V14.5.0): "Universal Mobile Telecommunications System (UMTS); LTE; Multimedia Broadcast/Multicast Service (MBMS); Protocols and codecs (3GPP TS 26.346 version 14.5.0 Release 14)".

[20] ETSI TS 129 212 (V14.6.0): "Universal Mobile Telecommunications System (UMTS); LTE; Policy and Charging Control (PCC); Reference points (3GPP TS 29.212 version 14.6.0 Release 14)".

[21] ETSI TS 129 214 (V14.6.0): "Universal Mobile Telecommunications System (UMTS); LTE; Policy and charging control over Rx reference point (3GPP TS 29.214 version 14.6.0 Release 14)".

[22] Void.

[23] ETSI TS 129 468 (V14.3.0): "Universal Mobile Telecommunications System (UMTS); LTE; Group Communication System Enablers for LTE (GCSE-LTE); MB2 reference point; Stage 3 (3GPP TS 29.468 version 14.3.0 Release 14)".

[24] ETSI TS 133 180 (V14.2.0): "LTE; Security of the mission critical service (3GPP TS 33.180 version 14.2.0 Release 14)".

[25] IETF RFC 3515: "The Session Initiation Protocol (SIP) Refer Method".

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

[27] IETF RFC 3903: "Session Initiation Protocol (SIP) Extension or Event State Publication".

[28] IETF RFC 4488: "Suppression of Session Initiation Protocol (SIP) REFER Method Implicit Subscription".

[29] IETF RFC 4825: "The Extensible Markup Language (XML) Configuration Access Protocol (XCAP)".

[30] IETF RFC 5366: "Conference Establishment Using Request-Contained Lists in the Session Initiation Protocol (SIP).

[31] IETF RFC 5373: "Requesting Answering Modes for the Session Initiation Protocol (SIP)".

[32] IETF RFC 5875: "An Extensible Markup Language (XML) Configuration Access Protocol (XCAP) Diff Event Package".

[33] IETF RFC 6135: "An Alternative Connection Model for the Message Session Relay Protocol (MSRP)".

[34] IETF RFC 6665: "SIP-Specific Event Notification".

[35] IETF RFC 7647: "Clarifications for the use of REFER with RFC 6665".

[36] OMA-TS-XDM-Core-V2-1-20120403-A: "XML Document Management (XDM) Specification,V2.1".

[37] OMA-TS-XDM-Group-V1-1-1-20170124-A: "Group XDM Specification, V1.1.1".

[38] IETF RFC 7230: "Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing".

[39] IETF RFC 5246: "The Transport Layer Security (TLS) Protocol Version 1.2".

[40] IETF RFC 6101: "The Secure Sockets Layer (SSL) Protocol Version 3.0".

[41] IETF RFC 4975: "The Message Session Relay Protocol (MSRP)".

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 Definition of terms, symbols and abbreviations

3.1 Terms

Void.

3.2 Symbols

Void.

3.3 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
ARP	Address Resolution Protocol
AS	Application Server
AUID	Application Unique ID
AVP	Attribute-Value Pairs
BM-SC	Broadcast Multicast - Service Centre
CMC	Configuration Management Client
CMS	Configuration Management Server
CONN	CONNectivity
CSC	Common Services Core
CSCF	Call Session Control Function
CSK	Client-Server Key
DTLS	Datagram Transport Layer Security
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
FD	File Distribution
GAR	GCS-Action-Request
GBR	Guaranteed Bit Rate
GCS-AS	Group Communication Service - Application Server
GCSE	Group Communication Service Enabler
GMC	Group Management Client
GMK	Group Master Key
GMS	Group Management Server
GNR	GCS-Notification-Request
HTTP	Hyper Text Transfer Protocol
ICE	In Case of Emergency
IdMS	Identity Management Server
IE	Information Element
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
ITD	Interoperability Test Description
KDF	Key Derivation Function
KMS	Key Management Server
KPI	Key Performance Indicator
LOC	LOCation
LTE-A	LTE-Advanced
MBMS	Multimedia Broadcast and Multicast Service
MBR	Maximum Bit Rate
MC	MultiCast
MCC	Mission Critical Communication
MCCP	Mission Critical MBMS subchannel Control Protocol
MCData	Mission Critical Data
MCMC	ASCII name string for Mission Critical MBMS subchannel Control Protocol
MCPC	Mission Critical Pre-established session Control
MCPT	ASCII name string for Mission Critical Push-to-Talk
MCPTT ID	MCPTT user IDentity
MCPTT	Mission Critical Push-To-Talk
MCS	Mission Critical Services
MCVideo	Mission Critical Video
MEA	MCPTT Emergency Alert
MEG	MCPTT Emergency Group
MEGC	MCPTT Emergency Group Call
MES	MCPTT Emergency State
MIG	MCPTT Imminent peril Group
MIGC	MCPTT Imminent peril Group Call
MNC	Mobile Network Code
MO	Management Object
MSCCK	MBMS SubChannel Control key
MSF	Mobile Storage Function
MSRP	Message Sending Relay Protocol
NFC	No Floor Control
OAM	Operation And Maintenance
ONN	ON Network calls
OTT	Over The Top
PCC	Policy and Charging Control
PCK	Private Call Key
PCRF	Policy and Charging Rules Function
PCSCF	Proxy Call Session Control Function
PES	Pre-Established Sessions
PLMN	Public Land Mobile Network
POST	HTTP method POST

PRF	Pseudo-Random Function
PSAP	Public Safety Answering Point
PSI	Public Service Identity
PTT	Push-To-Talk
QCI	QoS Class Identifier
RTCP	Real Time Control Protocol
RTP	Real-time Transport Protocol
RX	Rx Reference Point
SAGE	Security Algorithms Group of Experts
SAI	Service Area Identifier
SCTP	Stream Control Transmission Protocol
SDP	Session Description Protocol
SDS	Short Data Service
SEC	SECurity
SIP	Session Initiation Protocol
SPK	Signalling Protection Key
SSL	Secure Socket Layer
SUT	System Under Test
TC	Transmission Control
TCP	Transmission Control Protocol
TD	Test Description
TLS	Transport Layer Security
TMGI	Temporary Mobile Group Identity
TR	Technical Report
TRT	Test Reporting Tool
TS	Technical Specification
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
WFC	With Floor Control
XCAP	eXtensible markup language Configuration Access Protocol
XDM	XCAP Document Management
XML	eXtended Markup Language
XUI	XCAP Unique Identifier

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.

Table 1

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:

- MCPTT Private/Group Calls (unicast)
- MCPTT Group Call (eMBMS)
- MCPTT Emergency Group Call
- MCPTT Floor Control
- MCPTT Registration and service authorization

- MCPTT Affiliation
- MCPTT Location
- MCPTT Security
- MCData Services
- Specific selection of MCVideo Call Types
- CSC procedures (Group, Configuration, Identity and Key Management)

The basic structure to be analysed comprises MCS (MCPTT, MCData, MCVideo) application server(s) -both controlling and participating- and MCS UEs deployed over a generic SIP Core/IMS, LTE access network with and without MCS required PCC capabilities and native multicast support (i.e. Rel 14 eMBMS). Figure 1 illustrates the basic test infrastructure.

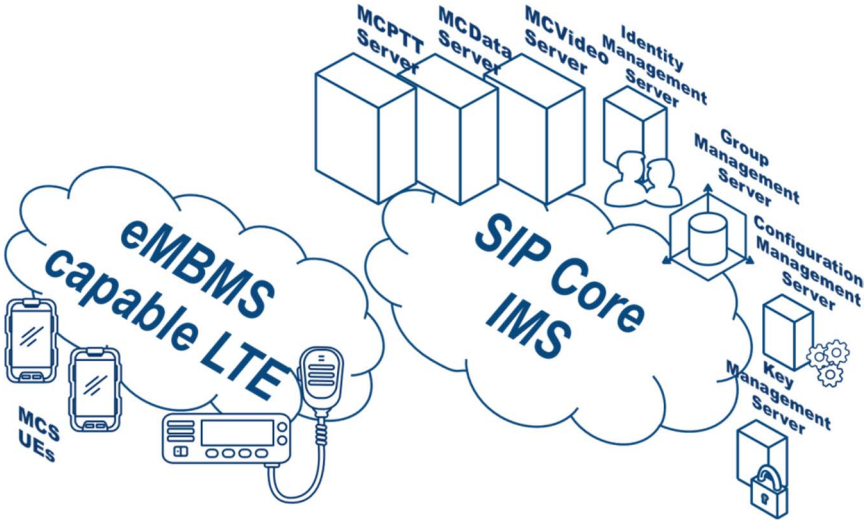

Figure 1: Typical MCS scenario to be considered in the second Plugtests

In Release13 the 3GPP already defined a comprehensive set of MCPTT Calls (see figure 2). For the second Plugtests additional Call Types in Release 14 (see figure 3) will be considered (First-to-answer call, Ambient Listening and callbacks).

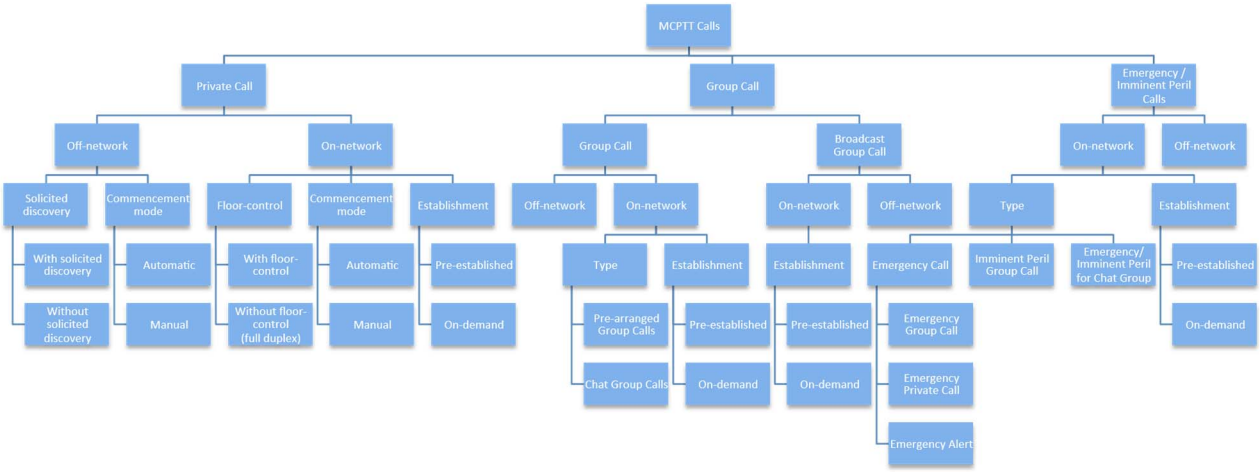

Figure 2: MCPTT call types in Release 13

Apart from "Mission Critical Voice" (MCPTT), MCData and MCVideo have been also defined in Release 14, with their associated call types (see figures 4 and 5). MCData and MCVideo have a set of common -duplicated- set of features with MCPTT, such as service deployment over SIP Core/IMS, registration, affiliation, location and CSC mechanisms. In this 2nd Plugtests, MCPTT will be used for the testing of these common features and MCData/MCVideo specific services and calls only.

Due to the large number of different cases and technologies involved, on the context of the 1st Plugtests the configurations in clause 5 and Test Cases in clause 7 will be initially analysed. Definitions of each call are collected from related normative references in clause 2.1.

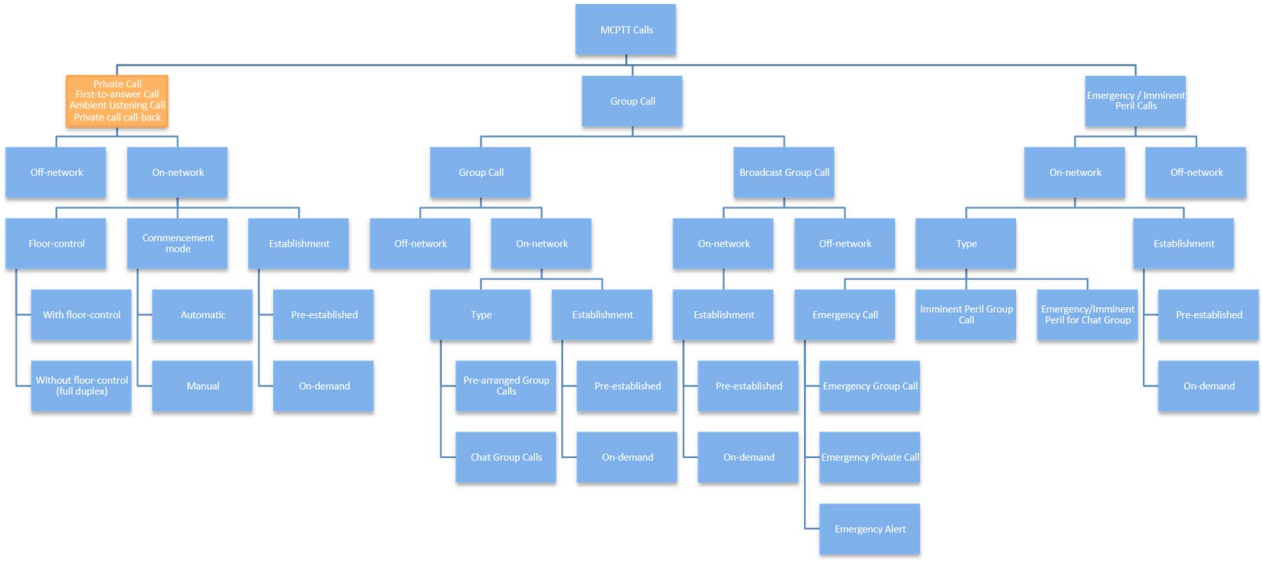

Figure 3: MCPTT call types in Release 14

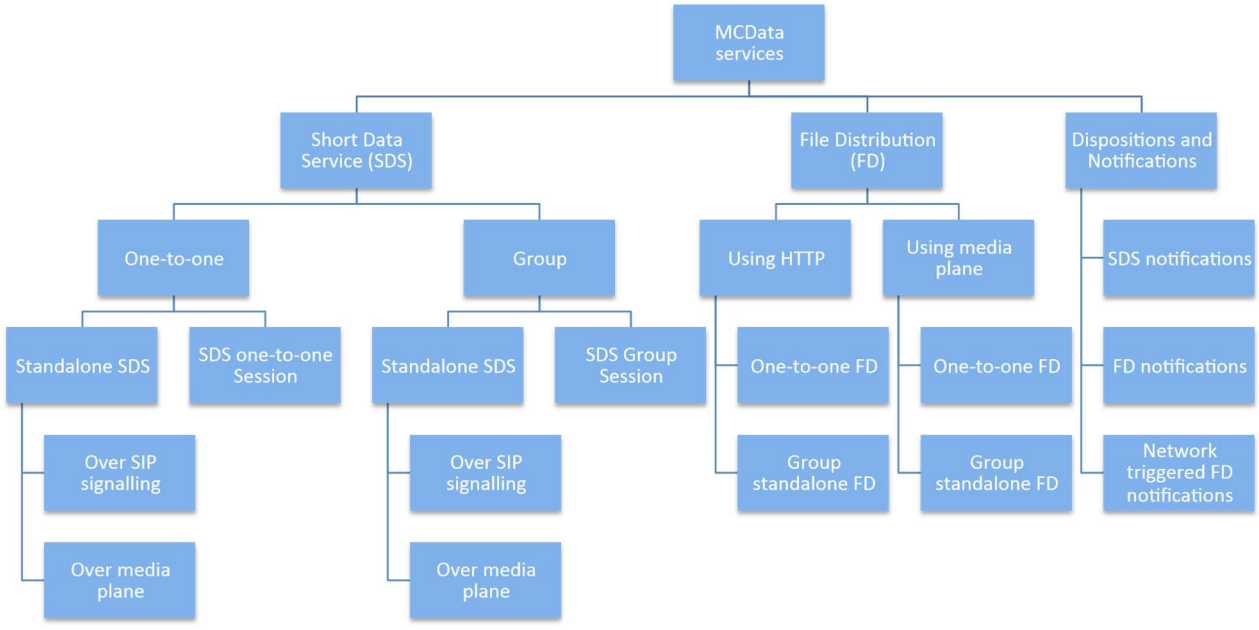

Figure 4: MCData services in Release 14

Considering the inclusion of MCData and MCVideo and the need for, not only re-testing core MCPTT features, but also Security and CSC interfaces, the number of possible test cases grows dramatically. In order to group those test cases systematically following the rationale in the 1st Plugtests the following high level test objectives are proposed as outcomes of the testing.

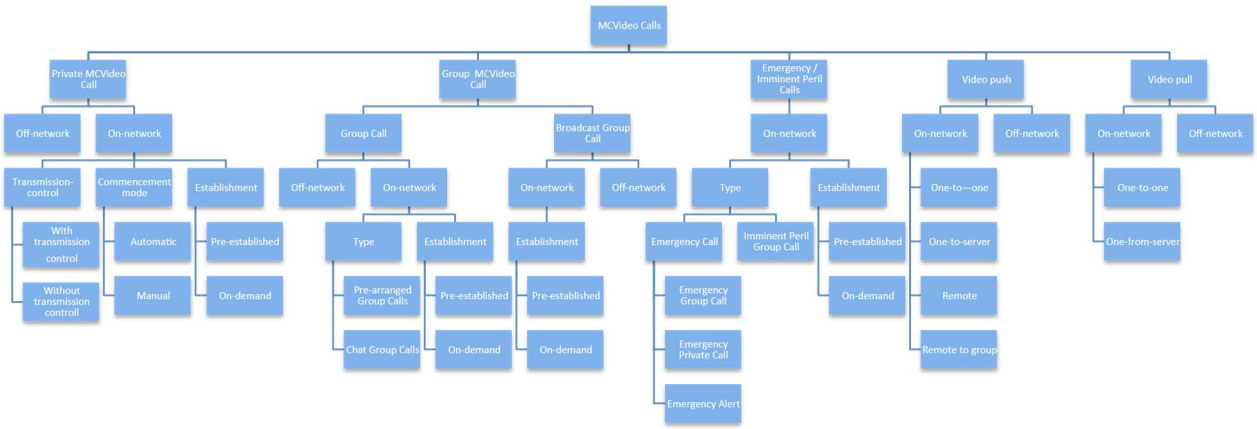

Figure 5: MCVideo call types in Release 14

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/MCData/MCVideo 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 MCS AS over the selected SIP Core/IMS so that all SIP messages are successfully delivered from MCS UEs to Participating/Controlling MCS Servers and vice versa. Application level refers to e2e signaling, 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) will be 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. Note this would be originally considered for MCPTT till MCVideo transmission control mechanisms are clarified.

- **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 (MCData and MCVideo are similar and will not result on specific test-cases).

- **Affiliation (affiliation):** Comprises MCPTT Client explicit and implicit affiliation.

- **Location (LOC):** Comprises Location configuration, retrieval and submission procedures for MCPTT (MCData and MCVideo are similar and will not result on specific test-cases).

- **OAM procedures (CSC):** Comprises OAM related IdMS, CMS, GMS and KMS interfacing procedures. Unless otherwise specified MCPTT only will be considered.

- **Security (SEC):** Comprises security related procedures ((de-)cyphering, key retrieval considered in KMS-related test cases in CSC test cases).

- **QoS support (KPI):** Comprises checking e2e QoS values fulfilling pre-defined thresholds for the defined KPIs.

The following lists collect the test objectives and specific test cases that are further explained in clause 7.

- **Connectivity (CONN) [53]:**

  - CONN-MCPTT/GROUP/PREA/ONDEM/NFC/01 (clause 7.2.1)

    - On-demand prearranged MCPTT Group Call (clauses 10.1.1.2.1, 10.1.1.3.1.1 and 10.1.1.4 in ETSI TS 124 379 [9])

- CONN-MCPTT/GROUP/PREA/ONDEM/NFC/02 (clause 7.2.2)

  On-demand prearranged MCPTT Group Call (clauses 10.1.1.2.1, 10.1.1.3.1.1 and 10.1.1.4 in ETSI TS 124 379 [9]): Emergency MCPTT 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 [9])

- CONN-MCPTT/GROUP/PREA/ONDEM/NFC/03 (clause 7.2.3)

  - On-demand prearranged MCPTT Group Call (clauses 10.1.1.2.1, 10.1.1.3.1.1 and 10.1.1.4 in ETSI TS 124 379 [9]): Imminent Peril MCPTT Group Call (clause 6.2.8.1.9-12 in ETSI TS 124 379 [9])

- CONN-MCPTT/GROUP/PREA/ONDEM/NFC/04 (clause 7.2.4)

  - On-demand prearranged MCPTT Group Call (clauses 10.1.1.2.1, 10.1.1.3.1.1 and 10.1.1.4 in ETSI TS 124 379 [9]): Broadcast MCPTT Group Call (clause 6.2.8.2 in ETSI TS 124 379 [9])

- CONN-MCPTT/GROUP/PREA/ONDEM/NFC/05 (clause 7.2.5)

  - On-demand prearranged MCPTT Group Call (clauses 10.1.1.2.1, 10.1.1.3.1.1 and 10.1.1.4 in ETSI TS 124 379 [9]: 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 [9])

- CONN-MCPTT/GROUP/PREA/ONDEM/NFC/06 (clause 7.2.6)

  - Termination of an on-demand prearranged MCPTT Group Calls (clauses 10.1.1.2.3.1 and 10.1.1.3.3.1 in ETSI TS 124 379 [9])

- CONN-MCPTT/GROUP/PREA/PRE/NFC/01 (clause 7.2.7)

  - Prearranged MCPTT 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 [9]

- CONN-MCPTT/GROUP/PREA/PRE/NFC/02 (clause 7.2.8)

  - Termination of a prearranged MCPTT 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 [9])

- CONN-MCPTT/GROUP/CHAT/ONDEM/NFC/01 (clause 7.2.9)

  - On-demand MCPTT 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 [9])

- CONN-MCPTT/GROUP/CHAT/ONDEM/NFC/02 (clause 7.2.10)

  - Ongoing on-demand MCPTT 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 [9])

- CONN-MCPTT/GROUP/CHAT/ONDEM/NFC/03 (clause 7.2.11)

  - Ongoing on-demand MCPTT 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 [9])

- CONN-MCPTT/GROUP/CHAT/ONDEM/NFC/04 (clause 7.2.12)

  - Cancellation of the in-progress emergency condition of an on demand MCPTT 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 [9])

- CONN-MCPTT/GROUP/CHAT/ONDEM/NFC/05 (clause 7.2.13)

  - Cancellation of the in-progress imminent peril condition of an undemand MCPTT 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 [9])

- CONN-MCPTT/GROUP/CHAT/PRE/NFC/01 (clause 7.2.14)
  - MCPTT 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 [9])
- CONN-MCPTT/PRIV/AUTO/ONDEM/WFC/NFC/01 (clause 7.2.15)
  - On-demand private MCPTT call with floor control (clause 11.1.1.2.1 in ETSI TS 124 379 [9]) and automatic commencement mode, see IETF RFC 5373 [31])
- CONN-MCPTT/PRIV/MAN/ONDEM/WFC/NFC/01 (clause 7.2.16)
  - On-demand private MCPTT call with floor control manual mode (clause 11.1.1.2.1 in ETSI TS 124 379 [9]) and manual commencement mode, see IETF RFC 5373 [31])
- CONN-MCPTT/PRIV/AUTO/PRE/WFC/NFC/01 (clause 7.2.17)
  - Pre-established private MCPTT call with floor control (clause 11.1.1.2.1 in ETSI TS 124 379 [9]) and automatic commencement mode, see IETF RFC 5373 [31])
- CONN-MCPTT/PRIV/MAN/PRE/WFC/NFC/01 (clause 7.2.18)
  - Pre-established private MCPTT call with floor control manual mode (clause 11.1.1.2.1 in ETSI TS 124 379 [9]) and manual commencement mode, see IETF RFC 5373 [31])
- CONN-MCPTT/PRIV/AUTO/ONDEM/WOFC/01 (clause 7.2.19)
  - On-demand private MCPTT call without floor control (clause 11.1.1.2.1 in ETSI TS 124 379 [9]) and automatic commencement mode, see IETF RFC 5373 [31])
- CONN-MCPTT/PRIV/MAN/ONDEM/WOFC/01 (clause 7.2.20)
  - On-demand private MCPTT call without floor control manual mode (clause 11.1.1.2.1 in ETSI TS 124 379 [9]) and manual commencement mode, see IETF RFC 5373 [31])
- CONN-MCPTT/PRIV/AUTO/PRE/WOFC/01 (clause 7.2.21)
  - Pre-established private MCPTT call without floor control (clause 11.1.1.2.1 in ETSI TS 124 379 [9]) and automatic commencement mode, see IETF RFC 5373 [31])
- CONN-MCPTT/PRIV/MAN/PRE/WOFC/01 (clause 7.2.22)
  - Pre-established private MCPTT call without floor control manual mode (clause 11.1.1.2.1 in ETSI TS 124 379 [9]) and manual commencement mode, see IETF RFC 5373 [31])
- CONN-MCPTT/ONN/FIRST/MANUAL/ONDEM/WFC/NFC/01 (clause 7.2.23)
  - MCPTT User initiates an on-demand first-to-answer MCPTT call with floor control (clauses 11.1.1.2.1, 11.1.1.3.1.1 and 11.1.1.4 in ETSI TS 124 379 [9])
- CONN-MCPTT/ONN/FIRST/MANUAL/ONDEM/WOFC/NFC/01 (clause 7.2.24)
  - MCPTT User initiates an on-demand first-to-answer MCPTT call without floor control (clause 11.1.2 in ETSI TS 124 379 [9])
- CONN-MCPTT/ONN/FIRST/MANUAL/PRE/WFC/NFC/01 (clause 7.2.25)
  - MCPTT User initiates an on-demand first-to-answer MCPTT call with floor control using pre-established sessions (clauses 11.1.1.2.2, 11.1.1.3.1.2, 11.1.3.2.2 and 11.1.1.4 in ETSI TS 124 379 [9] and IETF RFC 5366 [30])
- CONN-MCPTT/ONN/FIRST/MANUAL/PRE/WOFC/01 (clause 7.2.26)
  - MCPTT User initiates a pre-established first-to-answer MCPTT call in manual commencement mode without floor control

- CONN-MCPTT/ONN/CALLBACK/SETUP/01 (clause 7.2.27)
  - MCPTT User setups a private-call callback (clauses 11.1.1.2.1, 11.1.1.3.1.1 and 11.1.1.4 in ETSI TS 124 379 [9])
- CONN-MCPTT/ONN/CALLBACK/CANCEL/01 (clause 7.2.28)
  - MCPTT User cancels a private-call callback (clause 11.1.2 in ETSI TS 124 379 [9])
- CONN-MCPTT/ONN/CALLBACK/FULFIL/01 (clause 7.2.29)
  - MCPTT User fulfils a private-call callback
- CONN-MCPTT/ONN/AMBIENT/ONDEM/LOCAL/01 (clause 7.2.30)
  - MCPTT User setups locally an on-demand ambient listening call (clauses 11.1.6.2.1.1, 11.1.6.3 and 11.1.6.4 in ETSI TS 124 379 [9])
- CONN-MCPTT/ONN/AMBIENT/ONDEM/LOCAL/02 (clause 7.2.31)
  - MCPTT User releases locally an on-demand ambient listening call (clause 11.1.6.2.1.3 in ETSI TS 124 379 [9])
- CONN-MCPTT/ONN/AMBIENT/PRE/LOCAL/01 (clause 7.2.32)
  - MCPTT User setups locally an ambient listening call using preestablished session (clause 11.1.6.2.2 in ETSI TS 123 379 [4])
- CONN-MCPTT/ONN/AMBIENT/PRE/LOCAL/02 (clause 7.2.33)
  - MCPTT User releases locally an ambient listening call using preestablished session (clause 11.1.6.2.2.3 in ETSI TS 124 379 [9])
- CONN-MCPTT/ONN/AMBIENT/ONDEM/REMOTE/01 (clause 7.2.34)
  - MCPTT User setups remotely an on-demand ambient listening call (clause 11.1.6.2.1.1 in ETSI TS 124 379 [9])
- CONN-MCPTT/ONN/AMBIENT/ONDEM/REMOTE/02 (clause 7.2.35)
  - MCPTT User releases remotely an on-demand ambient listening call (clause 11.1.6.2.1.3 in ETSI TS 124 379 [9])
- CONN-MCPTT/ONN/AMBIENT/PRE/REMOTE/01 (clause 7.2.36)
  - MCPTT User setups remotely an ambient listening call using preestablished session
- CONN-MCPTT/ONN/AMBIENT/PRE/REMOTE/02 (clause 7.2.37)
  - MCPTT User releases remotely an ambient listening call using preestablished session
- CONN-MCPTT/ONN/GROUPCHANGE/01 (clause 7.2.38)
  - Remote change of selected group (clause 10.1.4 in ETSI TS 124 379 [9])
- CONN-MCDATA/O2O/STANDALONE/SDS/SIP/01 (clause 7.2.39)
  - One-to-one standalone SDS over SIP
- CONN-MCDATA/O2O/STANDALONE/SDS/MSRP/01 (clause 7.2.40)
  - One-to-one standalone SDS over media plane (MSRP)
- CONN-MCDATA/O2O/SESSION/SDS/MSRP/01 (clause 7.2.41)
  - One-to-one SDS session

- CONN-MCDATA/GROUP/STANDALONE/SDS/SIP/01 (clause 7.2.42)
  - Group standalone SDS over SIP
- CONN-MCDATA/GROUP/STANDALONE/SDS/MSRP/01 (clause 7.2.43)
  - Group standalone SDS over media plane (MSRP)
- CONN-MCDATA/GROUP/SESSION/SDS/MSRP/01 (clause 7.2.44)
  - Group SDS session
- CONN-MCDATA/O2O/FD/HTTP/01 (clause 7.2.45)
  - One-to-one FD using HTTP
- CONN-MCDATA/GROUP/FD/HTTP/01 (clause 7.2.46)
  - Group FD using HTTP
- CONN-MCDATA/O2O/FD/MSRP/01 (clause 7.2.47)
  - One-to-one FD using media plane (MSRP)
- CONN-MCDATA/GROUP/FD/MSRP/01 (clause 7.2.48)
  - Group FD using media plane (MSRP)
- CONN-MCDATA/DISNOT/SDS/01 (clause 7.2.49)
  - Standalone SDS with delivered and read notification
- CONN-MCDATA/DISNOT/SDS/02 (clause 7.2.50)
  - Group standalone SDS with delivered and read notification
- CONN-MCDATA/DISNOT/FD/01 (clause 7.2.51)
  - One-to-one FD using HTTP with file download completed notification
- CONN-MCDATA/DISNOT/FD/02 (clause 7.2.52)
  - Group FD using HTTP with file download completed notification
- CONN-MCDATA/NET/FD/01 (clause 7.2.53)
  - Network triggered FD notifications

- **Floor Controlling (FC) (2 test cases):**
  - FC/BASIC/01 (clause 7.3.1)
    - Basic FC functionality (clause 6 in ETSI TS 124 380 [10])
  - FC/BASIC/02 (clause 7.3.2)
    - Basic FC functionality. Effect of Priorities (following the example in clause A.3.5 in ETSI TS 124 380 [10]).
- **Registration & Authorization (REGAUTH) (3 test cases):**
  - REGAUTH/IDMSAUTH/01 (clause 7.4.1)
    - MCPTT Client authentication and tokens retrieval using IdMS ETSI TS 124 482 [12]
  - 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 [9])

- REGAUTH/PUBLISH/REGISTER/01 (clause 7.4.3)
  - MCPTT Client registration using SIP PUBLISH (clauses 7.2.2 and 7.3.3 in ETSI TS 124 379 [9])

- **Policing (PCC) (6 test cases):**
  - 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 [21])
  - 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 [21])
  - 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)
  - PCC/BEARERSETUP/03 (clause 7.5.5)
    - Unicast MC Bearer Setup by SIP Core/IMS using pre-established sessions (clauses 4.4.1 and 4.4.2 in ETSI TS 129 214 [21])
  - PCC/BEARERSETUP/04 (clause 7.5.6)
    - Unicast MC Bearer Setup by MCPTT Participating AS using pre-established sessions (clauses 4.4.1 and 4.4.2 in ETSI TS 129 214 [21])

- **EMBMS (8 test cases)**
  - 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 129 214 [21])
  - 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) (5 test cases):**
    - 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 [9])
    - 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 [9])
    - 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 [9])
    - 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 [9])
    - 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 [9])

- **Location (LOC) (3 test cases):**
    - 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 [9])
    - LOC/REQUEST/01 (clause 7.8.2)
        - Request for Location Report to the MCPTT Client (clauses 13.2.3 and 13.3.3 in ETSI TS 124 379 [9])
    - LOC/SUBMISSION/01 (clause 7.8.3)
        - MCPTT Client Sends location upon trigger (clause 13.3.4 in ETSI TS 124 379 [9])

- **OAM (CSC) (8 test cases):**
    - CSC-CMS/UECONF/UE/01 (clause 7.9.1)
        - Subscription and UE configuration document retrieval from the MC UE (clauses 6.3.3 and 6.3.13 - specifically clauses 6.3.13.2.2a and 6.3.13.3.2.3f in [14]), OMA XDM mechanisms and procedures in IETF RFC 4825 [29]
    - CSC-CMS/UPROCONF/UE/01 (clause 7.9.2)
        - Subscription and user profile configuration document retrieval from the MC UE
    - CSC-CMS/SERVCONF/UE/01 (clause 7.9.3)
        - Subscription and service configuration document retrieval from the MC UE
    - CSC-CMS/SERVCONF/MCSSERV/01 (clause 7.9.4)
        - Subscription and service configuration document retrieval from the MCS server

- CSC-GMS/GROUP/UE/01 (clause 7.9.5)
  - Subscription and group document retrieval from the MC UE
- CSC-GMS/GROUP/MCSSERV/01 (clause 7.9.6)
  - Subscription and group document retrieval from the MCS Server
- CSC/MULTIPLESUBS/GROUP/UE/01 (clause 7.9.7)
  - Subscription and retrieval of multiple documents from the CMS using subscription proxy
- CSC/MULTIPLESUBSGMS/UE/01 (clause 7.9.8)
  - Subscription and retrieval of multiple documents from the GMS using subscription proxy

- **Security (SEC) (17 test cases):**
  - SEC/KEYMDOWNLOAD/WPROXY/01 (clause 7.10.1)
    - Key material download from KMS to MCPTT client (CSC-8) with proxy
  - SEC/KEYMDOWNLOAD/WPROXY/02 (clause 7.10.2)
    - Key material download from KMS to MCPTT server (CSC-9) with proxy
  - SEC/KEYMDOWNLOAD/WPROXY/03 (clause 7.10.3)
    - Key material download from KMS to MCPTT GMS (CSC-10) with proxy
  - SEC/KEYMDOWNLOAD/WOPROXY/01 (clause 7.10.4)
    - Key material download from KMS to MCPTT client (CSC-8) without proxy
  - SEC/KEYMDOWNLOAD/WOPROXY/02 (clause 7.10.5)
    - Key material download from KMS to MCPTT server (CSC-9) without proxy
  - SEC/KEYMDOWNLOAD/WOPROXY/03 (clause 7.10.6)
    - Key material download from KMS to MCPTT GMS (CSC-10) without proxy
  - SEC/KEYDIST/CSK/01 (clause 7.10.7)
    - Key management from MC client to MC server (CSK upload)
  - SEC/KEYDIST/GMK/01 (clause 7.10.8)
    - Key management for group communications (GMK)
  - SEC/KEYDIST/MUSIK/01 (clause 7.10.9)
    - Key management from MC server to MC client (Key download MuSiK)
  - SEC/ENCRYPTION/PRIVATE/01 (clause 7.10.10)
    - Encryption of MCPTT private calls (use of derived encryption keys from
    - PCK for the audio and CSK for floor control and RTCP reports)
  - SEC/ENCRYPTION/GROUP/01 (clause 7.10.11)
    - Encryption of MCPTT group calls (use of derived encryption keys from GMK for the audio and CSK for floor control and RTCP reports)
  - SEC/ENCRYPTION/GROUPEMBMS/01 (clause 7.10.12)
    - <D-w>

- SEC/XMLENCRYPT/PRIVATE/01 (clause 7.10.13)
  - XML contents encryption in MCPTT private calls (mcptt-info and resource-lists)
- SEC/XMLENCRYPT/GROUP/01 (clause 7.10.14)
  - XML contents encryption in MCPTT group calls (mcptt-info)
- SEC/XMLENCRYPT/AFFIL/01 (clause 7.10.15)
  - XML contents encryption in affiliation procedure
- SEC/XMLENCRYPT/LOC/01 (clause 7.10.16)
  - XML contents encryption in location procedure
- SEC/XMLENCRYPT/REGAUTH/01 (clause 7.10.17)
  - XML contents encryption in registration and authorization procedures

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 [9]. 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.

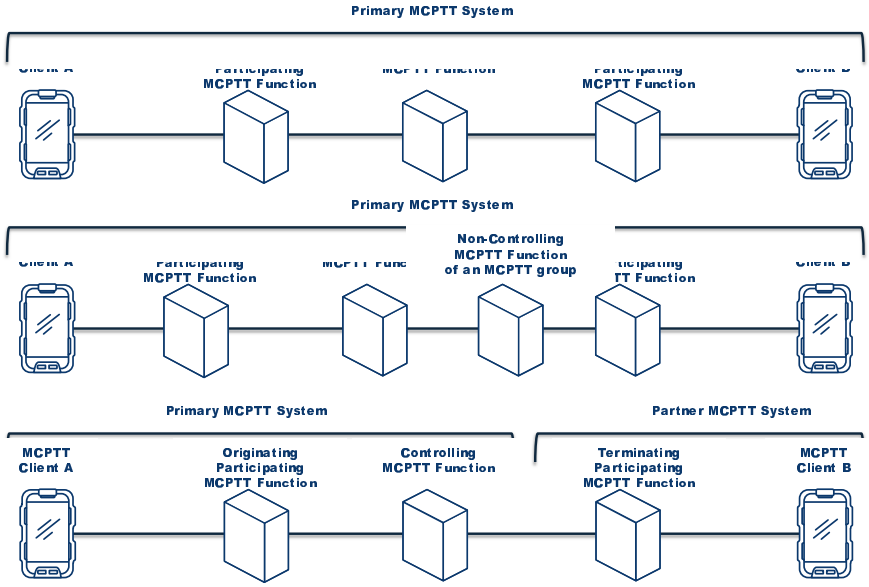

Figure 6: Functional connectivity modes (figures 5.3.2.1 to 5.3.2.3 of ETSI TS 124 379 [9])

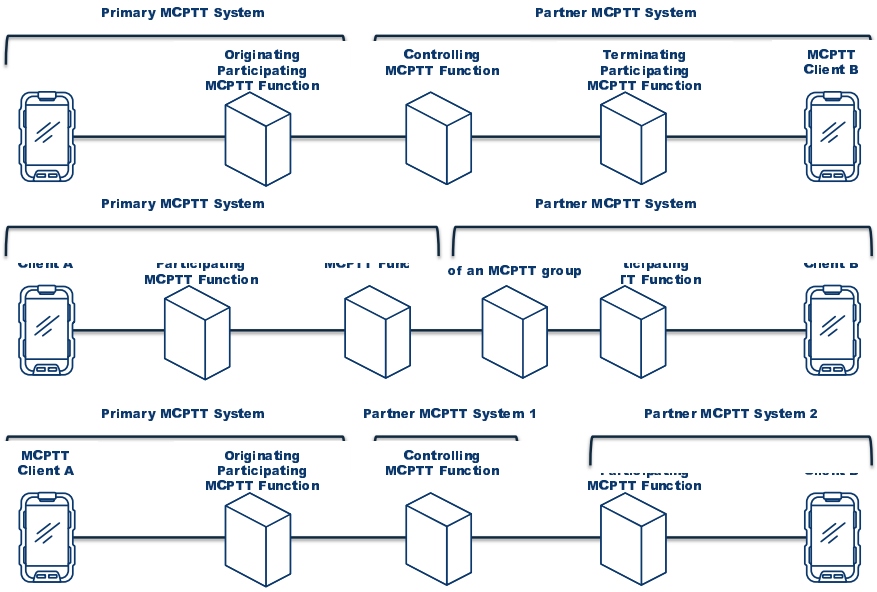

Figure 7: Functional connectivity modes (figures 5.3.2.4 to 5.3.2.6 of ETSI TS 124 379 [9])

5.2 CFG_ONN_OTT-1

CFG_ONN_OTT-1 is shown in figure 8.

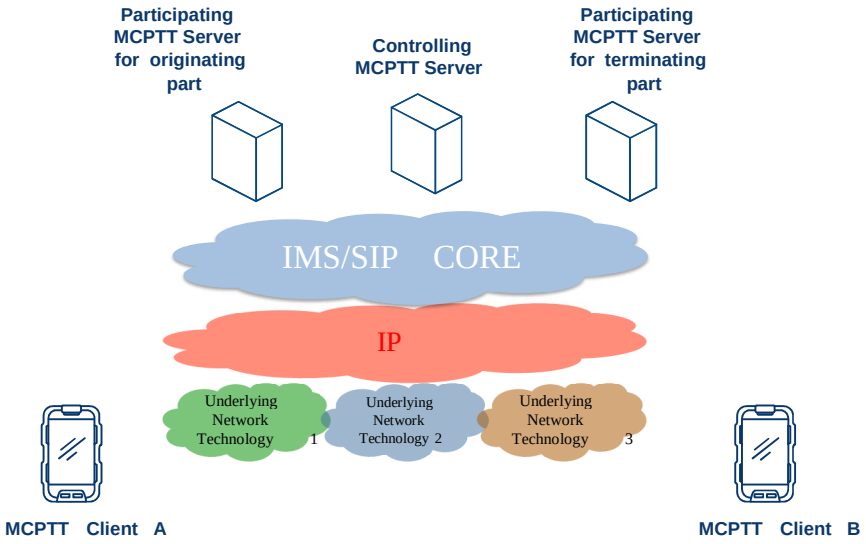

Figure 8: CFG_ONN_OTT-1 Scheme

MCPTT (MCS in general) UEs, SIP Core/IMS and MCPTT Server(s) are required. It will 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) will provide 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]), will 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 8).

Additionally, figure 9 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.

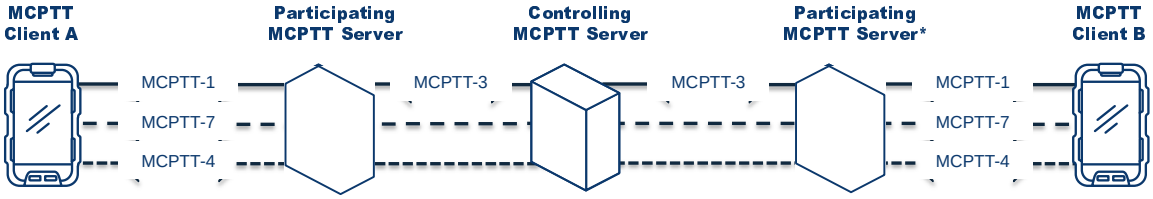

Figure 9: CFG_ONN_OTT-1 Interfaces for the unicast case

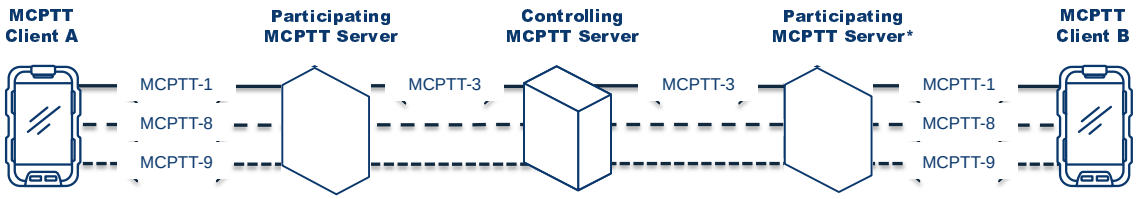

Figure 10: CFG_ONN_OTT-1 Interfaces for the multicast case

Finally, figure 10 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 will have PCC capabilities and therefore will enforce QoS policies in terms of prioritization and pre-emptiveness in unicast bearers including new Public Safety QCI 65/69 (but still no Rel. 13 eMBMS capabilities). Therefore, a Rx interface will be exposed and related reference points and signaling mechanisms will be tested.

As depicted in figure 11 and defined in [4] clauses 5.2.9.3 and 9.2.2.3.2-3 either the SIP Core or the MCPTT Server itself could signal the PCC mechanisms related to Unicast Bearer (MCPTT-5, Rx interface).

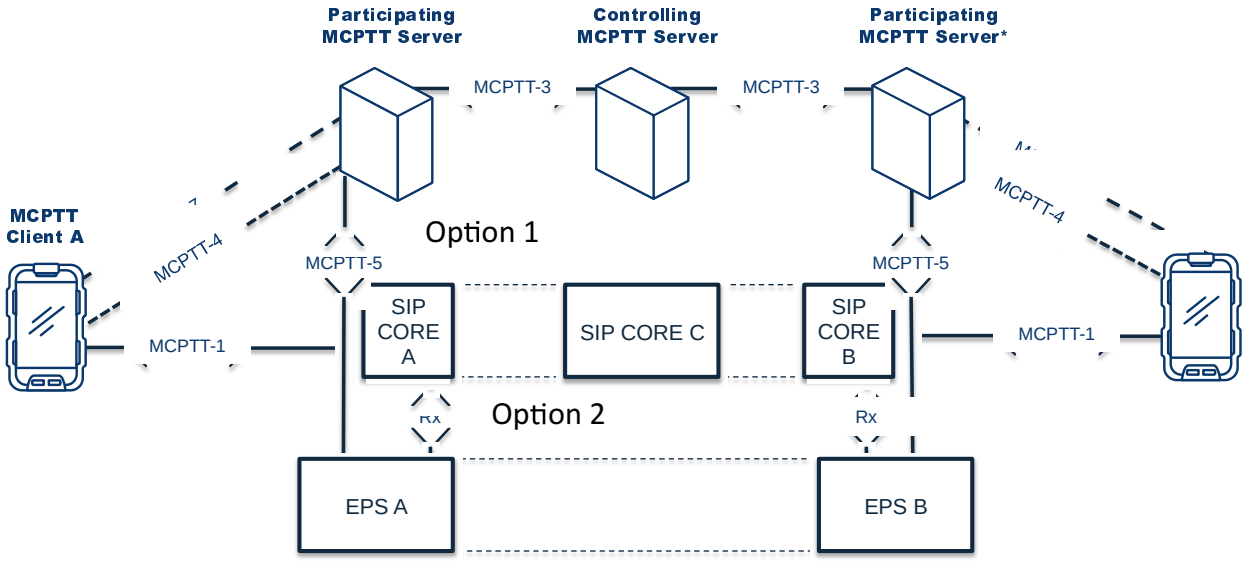

Figure 11: CFG_ONN_UNI-MC-LTE-1 Application plane interfaces

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 + needed MCPTT Rel 14 related interfaces).

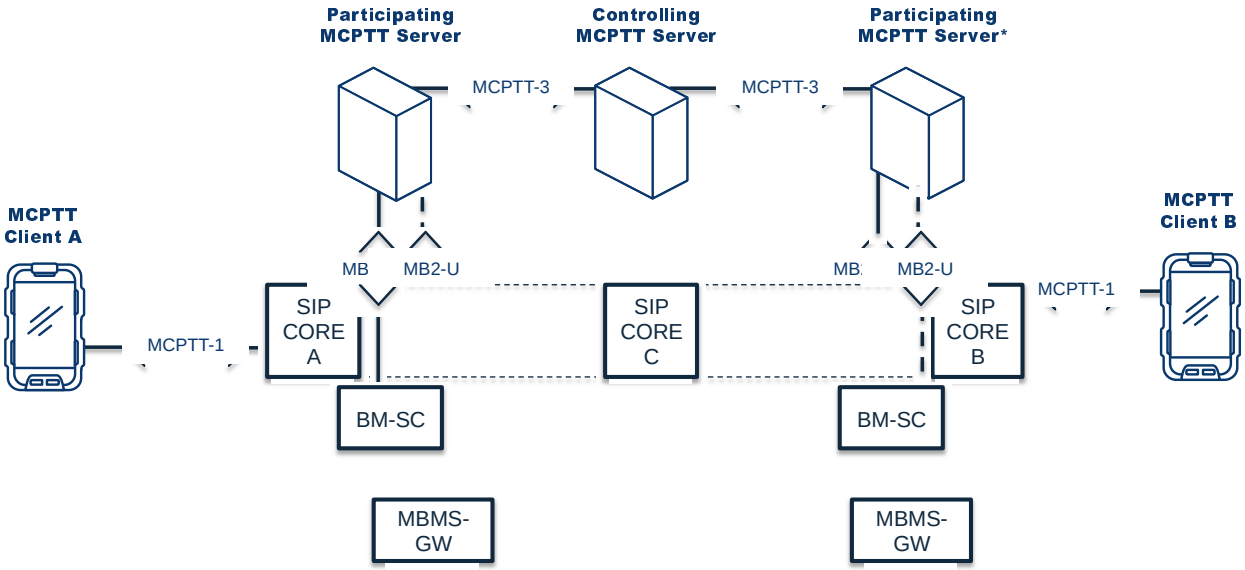

Figure 12: CFG_ONN_MULTI-MC-LTE-1 Application plane interfaces

6 Interoperable Functions Statement (IFS)

6.1 Entities

Table 2: Entities

Item	Which entity is supported?	Status	Support
1	UE		
2	MCPTT Client		
3	MCData Client		
4	MCVideo Client		
5	IMS		
6	MCPTT Participating AS		
7	MCPTT Controlling AS		
8	joint MCPTT Participating & Controlling AS		
9	MCData Participating AS		
10	MCData Controlling AS		
11	joint MCData Participating & Controlling AS		
12	MCVideo Participating AS		
13	MCVideo Controlling AS		
14	joint MCVideo Participating & Controlling AS		
15	BM-SC & MBMS-GW		
16	PCRF		
17	EPS		
18	CMS		
19	GMS		
20	KMS		
21	IDMS		

6.2 UE Features

Table 3: UE features

Item	Feature	ID	Ref	Status	Support
1	Does the UE support Mission Critical APNs and QCIs?	UE_MC-APN	[4]		
2	Does the UE support EMBMS?	UE_EMBMS	[19]		

6.3 MCPTT Client Features

Table 4: MCPTT Client features

Item	Feature	ID	Ref	Status	Support
1	Does MCPTT-Client support Authentication and ID retrieval from IDMS?	MCPTT-Client_IDMS	[12]		
2	Does MCPTT-Client support PUBLISH Based Registration?	MCPTT-Client_PUBREG	[9]		
3	Does MCPTT-Client support REGISTER Based Registration?	MCPTT-Client_REGREG	[9]		
4	Does MCPTT-Client support On-Network MCPTT private and group calling?	MCPTT-Client_ONN-MCPTT-CALL	[9]		
5	Does MCPTT-Client support Release 14 specific MCPTT call types?	MCPTT-Client_ONN-MCPTT-Rel14	[9]		
6	Does MCPTT-Client support On-Network MCPTT floor controlling?	MCPTT-Client_ONN-MCPTT-FC	[10]		
7	Does MCPTT-Client support XML cyphering mechanisms?	MCPTT-Client_ONN-SEC-XML	[24]		
8	Does MCPTT-Client support media flows cyphering mechanisms?	MCPTT-Client_ONN-SEC-MEDIA	[24]		
9	Does MCPTT-Client support AMR-WB codec?	MCPTT-Client_AMR-WB	[18]		
10	Does MCPTT-Client support EVS codec?	MCPTT-Client_EVS	[18]		
11	Does MCPTT-Client support Configuration retrieval from CMS?	MCPTT-Client_CMS	[14]		
12	Does MCPTT-Client support Key retrieval from KMS?	MCPTT-Client_KMS	[24]		
13	Does MCPTT-Client support Mission Critical APNs and QCIs?	MCPTT-Client_MC-APN	[4]		
14	Does MCPTT-Client support EMBMS?	MCPTT-Client_EMBMS	[19]		
15	Does MCPTT-Client support Location configuration and submission?	MCPTT-Client_LOC	[9]		

6.4 MCData Client Features

Table 5: IMS features

Item	Feature	ID	Ref	Status	Support
1	Does MCData-Client support Authentication and ID retrieval from IDMS?	MCData-Client_IDMS	[12]		
2	Does MCData-Client support PUBLISH Based Registration?	MCData-Client_PUBREG	[9]		
3	Does MCData-Client support REGISTER Based Registration?	MCData-Client_REGREG	[9]		
4	Does MCData-Client support On-Network MCData SDS over signalling plane?	MCData-Client_ONN-MCData-SDS-SP	[8]		
5	Does MCData-Client support On-Network MCData SDS over media plane?	MCData-Client_ONN-MCData-SDS-MP	[17]		
6	Does MCData-Client support On-Network MCData FD over signalling plane?	MCData-Client_ONN-MCData-FD-SP	[8]		
7	Does MCData-Client support On-Network MCData FD over media plane?	MCData-Client_ONN-MCData-FD-MP	[17]		
8	Does MCData-Client support Configuration retrieval from CMS?	MCData-Client_CMS	[14]		
9	Does MCData-Client support Key retrieval from KMS?	MCData-Client_KMS	[24]		
10	Does MCData-Client support Mission Critical APNs and QCIs?	MCData-Client_MC-APN	[4]		
11	Does MCData-Client support EMBMS?	MCData-Client_EMBMS	[19]		
12	Does MCData-Client support Location configuration and submission?	MCData-Client_LOC	[9]		

6.5 MCVideo Client Features

Table 6: MCVideo Client features

Item	Feature	ID	Ref	Status	Support
1	Does MCVideo-Client support Authentication and ID retrieval from IDMS?	MCVideo-Client_IDMS	[12]		
2	Does MCVideo-Client support PUBLISH Based Registration?	MCVideo-Client_PUBREG	[9]		
3	Does MCVideo-Client support REGISTER Based Registration?	MCVideo-Client_REGREG	[9]		
4	Does MCVideo-Client support On-Network MCVideo private and group calling?	MCVideo-Client_ONN-MCVideo-CALL	[7]		
5	Does MCVideo-Client support On-Network MCVideo transmission controlling?	MCVideo-Client_ONN-MCVideo-TC	[15]		
6	Does MCVideo-Client support H264 codec?	MCVideo-Client_H264	[18]		
7	Does MCVideo-Client support Configuration retrieval from CMS?	MCVideo-Client_CMS	[14]		
8	Does MCVideo-Client support Key retrieval from KMS?	MCVideo-Client_KMS	[24]		
9	Does MCVideo-Client support Mission Critical APNs and QCIs?	MCVideo-Client_MC-APN	[4]		
10	Does MCVideo-Client support EMBMS?	MCVideo-Client_EMBMS	[19]		
11	Does MCVideo-Client support Location configuration and submission?	MCVideo-Client_LOC	[9]		

6.6 IMS Features

Table 7: IMS features

Item	Feature	ID	Ref	Status	Support
1	Does the IMS support 3rd Party REGISTER?	IMS_3RDPARTYREG	[9]		
2	Does the IMS support MCPTT compatible Rx Interface in the PCSCF?	IMS_RX	[21]		

6.7 MCPTT-Participating AS Features

Table 8: MCPTT-Participating AS features

Item	Feature	ID	Ref	Status	Support
1	Does the MCPTT-Part support REGISTER+PUBLISH Based Service Authorization?	MCPTT-Part_PUBAUTH	[9]		
2	Does the MCPTT-Part support REGISTER Based Authorization?	MCPTT-Part_REGAUTH	[9]		
3	Does the MCPTT-Part support On-Network MCPTT private and group calling?	MCPTT-Part_ONN-MCPTT-CALL	[9]		
4	Does the MCPTT-Part support Release 14 specific MCPTT call types?	MCPTT-Part_ONN-MCPTT-Rel14	[9]		
5	Does the MCPTT-Part support On-Network MCPTT floor controlling?	MCPTT-Part_ONN-MCPTT-FC	[10]		
6	Does the MCPTT-Part support XML cyphering mechanisms?	MCPTT-Part_ONN-SEC-XML	[24]		
7	Does the MCPTT-Part support media flows cyphering mechanisms?	MCPTT-Part_ONN-SEC-MEDIA	[24]		
8	Does the MCPTT-Part support Location?	MCPTT-Part_LOC	[9]		
9	Does the MCPTT-Part support Affiliation Procedures?	MCPTT-Part_AFFIL	[9]		
10	Does the MCPTT-Part support MCPTT compatible MCPTT-5 (Rx) Interface?	MCPTT-Part_RX	[21]		
11	Does the MCPTT-Part support MB2-C and MB2-U interfaces?	MCPTT-Part_GCSE	[23]		
12	Does the MCPTT-Part support Key retrieval from KMS?	MCPTT-Part_KMS	[24]		

6.8 MCPTT-Controlling AS Features

Table 9: 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	[9]		
2	Does the MCPTT-Ctrl support Release 14 specific MCPTT call types?	MCPTT-Ctrl_ONN-MCPTT-Rel14	[9]		
3	Does the MCPTT-Ctrl support On-Network MCPTT floor controlling?	MCPTT-Ctrl_ONN-MCPTT-FC	[10]		
4	Does the MCPTT-Ctrl support XML cyphering mechanisms?	MCPTT-Ctrl_ONN-SEC-XML	[24]		
5	Does the MCPTT-Ctrl support media flows cyphering mechanisms?	MCPTT-Ctrl_ONN-SEC-MEDIA	[24]		
6	Does the MCPTT-Ctrl support Location Configuration?	MCPTT-Ctrl_LOC	[9]		
7	Does the MCPTT-Ctrl support Group composition retrieval from GMS?	MCPTT-Ctrl_GMS	[11]		

6.9 MCData-Participating AS Features

Table 10: MCData-Participating AS features

Item	Feature	ID	Ref	Status	Support
1	Does the MCData-Part support REGISTER+PUBLISH Based Service Authorization?	MCData-Part_PUBAUTH	[9]		
2	Does the MCData-Part support REGISTER Based Authorization?	MCData-Part_REGAUTH	[9]		
3	Does the MCData-Part support On-Network MCData SDS over signalling plane?	MCData-Part_ONN-MCData-SDS-SP	[8]		
4	Does the MCData-Part support On-Network MCData SDS over media plane?	MCData-Part_ONN-MCData-SDS-MP	[17]		
5	Does the MCData-Part support On-Network MCData FD over signalling plane?	MCData-Part_ONN-MCData-FD-SP	[8]		
6	Does the MCData-Part support On-Network MCData FD over media plane?	MCData-Part_ONN-MCData-FD-MP	[17]		
7	Does the MCData-Part support Location?	MCData-Part_LOC	[9]		
8	Does the MCData-Part support Affiliation Procedures?	MCData-Part_AFFIL	[9]		
9	Does the MCData-Part support MCData compatible Rx Interface?	MCData-Part_RX	[21]		
10	Does the MCData-Part support MB2-C and MB2-U interfaces?	MCData-Part_GCSE	[23]		

6.10 MCData-Controlling AS Features

Table 11: MCData-Controlling AS features

Item	Feature	ID	Ref	Status	Support
1	Does the MCData-Ctrl support On-Network MCData SDS over signalling plane?	MCData-Ctrl_ONN-MCData-SDS-SP	[8]		
2	Does the MCData-Ctrl support On-Network MCData SDS over media plane?	MCData-Ctrl_ONN-MCData-SDS-MP	[17]		
3	Does the MCData-Ctrl support On-Network MCData FD over signalling plane?	MCData-Ctrl_ONN-MCData-FD-SP	[8]		
4	Does the MCData-Ctrl support On-Network MCData FD over media plane?	MCData-Ctrl_ONN-MCData-FD-MP	[17]		
5	Does the MCData-Ctrl support Location Configuration?	MCData-Ctrl_LOC	[9]		
6	Does the MCData-Ctrl support Group composition retrieval from GMS?	MCData-Ctrl_GMS	[11]		

6.11 MCVideo-Participating AS Features

Table 12: MCVideo-Participating AS features

Item	Feature	ID	Ref	Status	Support
1	Does the MCVideo-Part support REGISTER+PUBLISH Based Service Authorization?	MCVideo-Part_PUBAUTH	[9]		
2	Does the MCVideo-Part support REGISTER Based Authorization?	MCVideo-Part_REGAUTH	[9]		
3	Does the MCVideo-Part support On-Network MCVideo private and group calling?	MCVideo-Part_ONN-MCVideo-CALL	[7]		
4	Does the MCVideo-Part support On-Network MCVideo transmission controlling?	MCVideo-Part_ONN-MCVideo-TC	[15]		
5	Does the MCVideo-Part support H264 codec?	MCVideo-Part_H264	[18]		
6	Does the MCVideo-Part support Location?	MCVideo-Part_LOC	[9]		
7	Does the MCVideo-Part support Affiliation Procedures?	MCVideo-Part_AFFIL	[9]		
8	Does the MCVideo-Part support MCVideo compatible MCVideo Rx Interface?	MCVideo-Part_RX	[21]		
9	Does the MCVideo-Part support MB2-C and MB2-U interfaces?	MCVideo-Part_GCSE	[23]		

6.12 MCVideo-Controlling AS Features

Table 13: MCVideo-Controlling AS features

Item	Feature	ID	Ref	Status	Support
1	Does the MCVideo-Ctrl support On-Network MCVideo private and group calling?	MCVideo-Ctrl_ONN-MCVideo-CALL	[7]		
2	Does the MCVideo-Ctrl support On-Network MCVideo transmission controlling?	MCVideo-Ctrl_ONN-MCVideo-TC	[15]		
3	Does the MCVideo-Ctrl support H264 codec?	MCVideo-Ctrl_H264	[18]		
4	Does the MCVideo-Ctrl support Location Configuration?	MCVideo-Ctrl_LOC	[9]		
5	Does the MCVideo-Ctrl support Group composition retrieval from GMS?	MCVideo-Ctrl_GMS	[11]		

6.13 BM-SC Features

Table 14: BM-SC features

Item	Feature	ID	Ref	Status	Support
1	Does the BM-SC support MB2-C and MB2-U interfaces?	BM-SC_GCSE	[23]		

6.14 EPS Features

Table 15: EPS (LTE eUTRAN + EPC) features

Item	Feature	ID	Ref	Status	Support
1	Does the EPS support Mission Critical APNs and QCIs?	EPS_MC-APN	[4]		
2	Does the EPS support MCVideo compatible Gx interface with the PCRF?	EPS_GX	[20]		
3	Does the EPS support EMBMS capable EUTRAN+EPC?	EPS_EMBMS	[19]		

6.15 PCRF Features

Table 16: PCRF features

Item	Feature	ID	Ref	Status	Support
1	Does the MCVideo interface? PCRF support compatible RX	PCRF_RX	[21]		

7 Test Descriptions

7.1 Common Remarks

Initially the interactions with the support servers 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 may be manually pre-configured at the different Functional Elements. Those users are considered as allowed to actually carry out the involved procedures.

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

Similarly, MCS-specific MCPTT Client authentication (particularly MCData and MCVideo), 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 (CONN)

7.2.1 MCPTT User initiates an on-demand prearranged MCPTT Group Call [CONN-MCPTT/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 [9].

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

Message Sequence Diagram

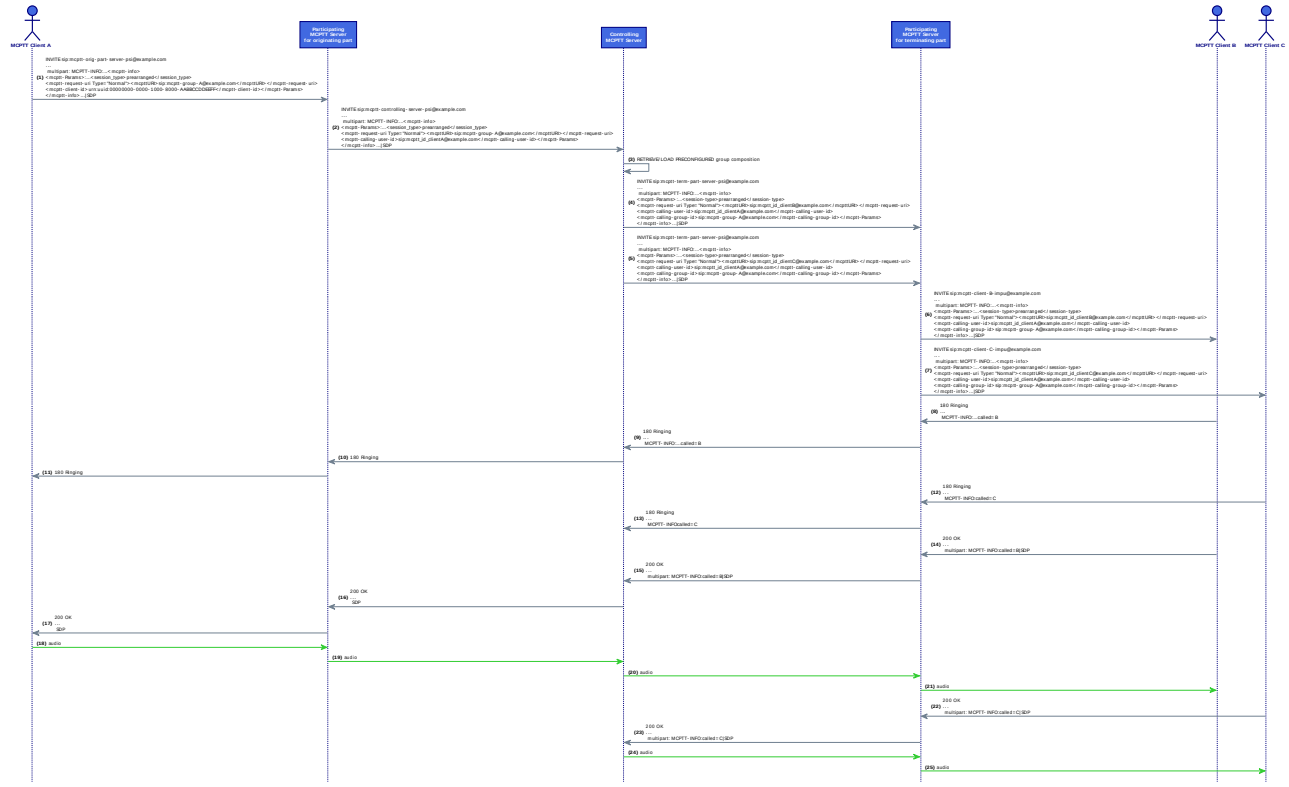

Figure 13: CONN-MCPTT/ONN/GROUP/PREA/ONDEM/NFC/01 Message Sequence

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">
                    < mcpttString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttString>
        </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 17: CONN-MCPTT/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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 [9].			

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

The test is equivalent to CONN-MCPTT/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 [9] 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

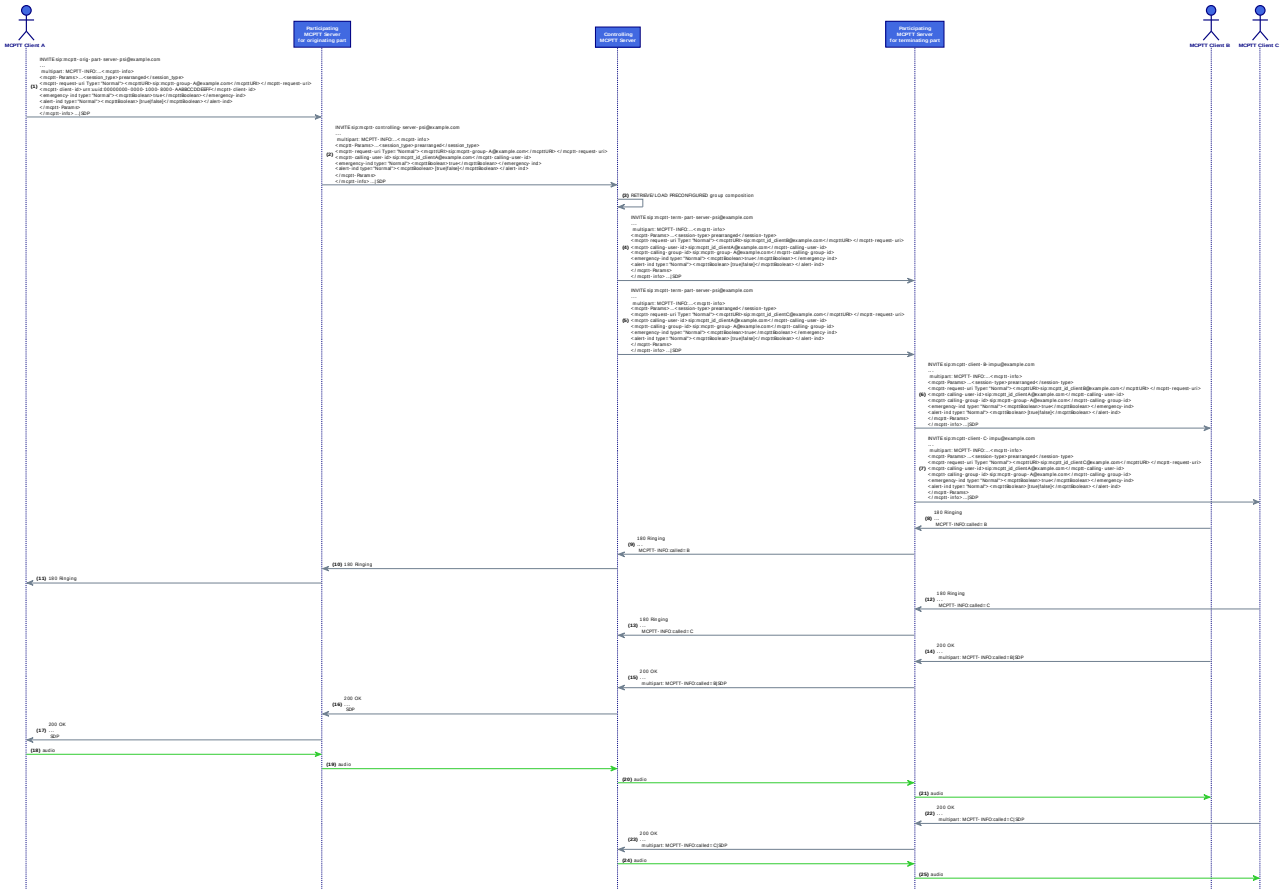

Figure 14: CONN-MCPTT/ONN/GROUP/PREA/ONDEM/NFC/02 Message Sequence

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">
      <mcpttString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttString>
    </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 18: CONN-MCPTT/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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 [9].			

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-MCPTT/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 [9] 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

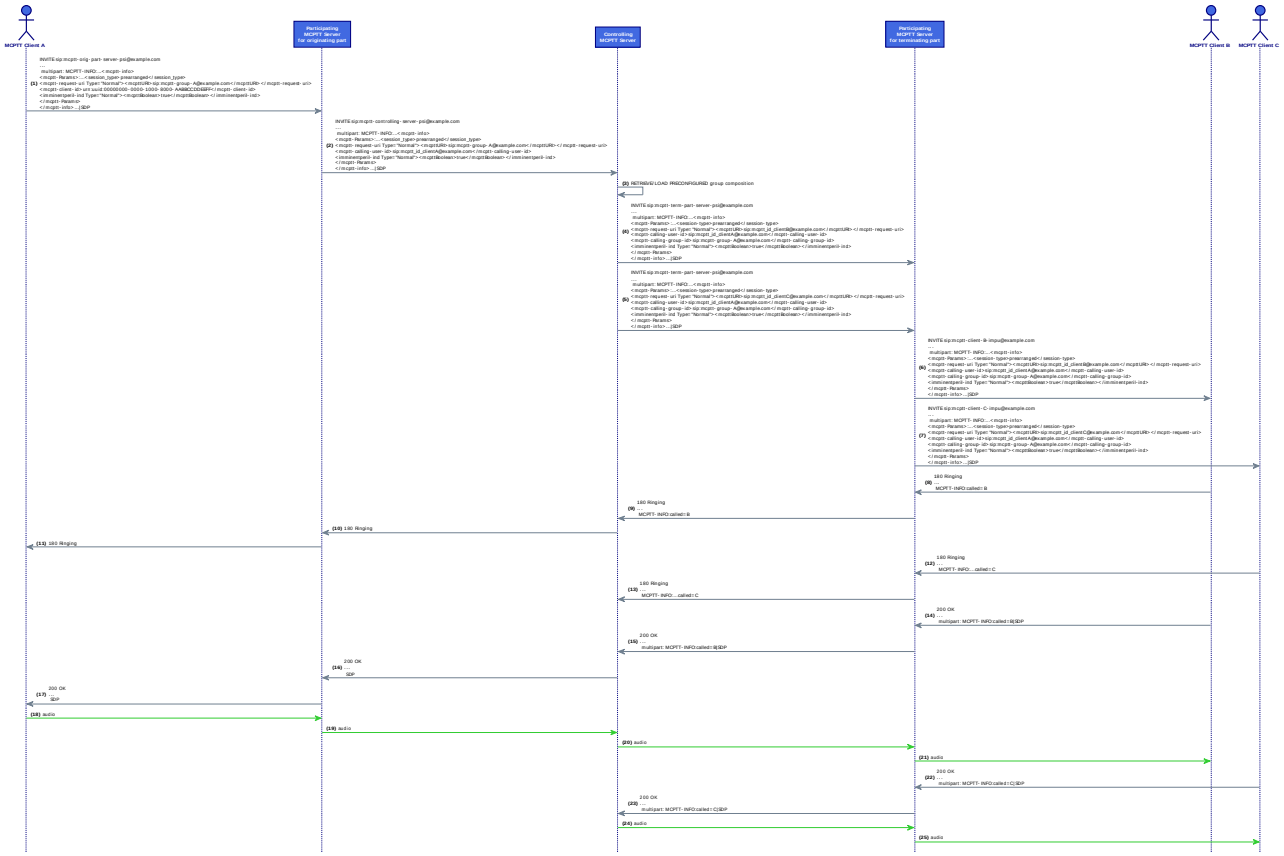

Figure 15: CONN-MCPTT/ONN/GROUP/PREA/ONDEM/NFC/03 Message Sequence

Message Details

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-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">
<mcpttString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttString>
</mcptt-client-id>
<imminentperil-ind Type="Normal">
<mcpttBoolean>true</mcpttBoolean>
</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 Type="Normal">
<mcpttBoolean>true</mcpttBoolean>
</imminentperil-ind>
</mcptt-Params>
</mcpttinfo>
--[boundary] ...
...
...
```

Interoperability Test Description

Table 19: CONN-MCPTT/ONN/GROUP/PREA/ONDEM/NFC/03 ITD

Interoperability Test Description	
Identifier	CONN-MCPTT/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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])
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-MCPTT/ONN/GROUP/PREA/ONDEM/NFC/04]

The test is equivalent to CONN-MCPTT/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 [9] 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 123 379 [4] for more details).

Message Sequence Diagram

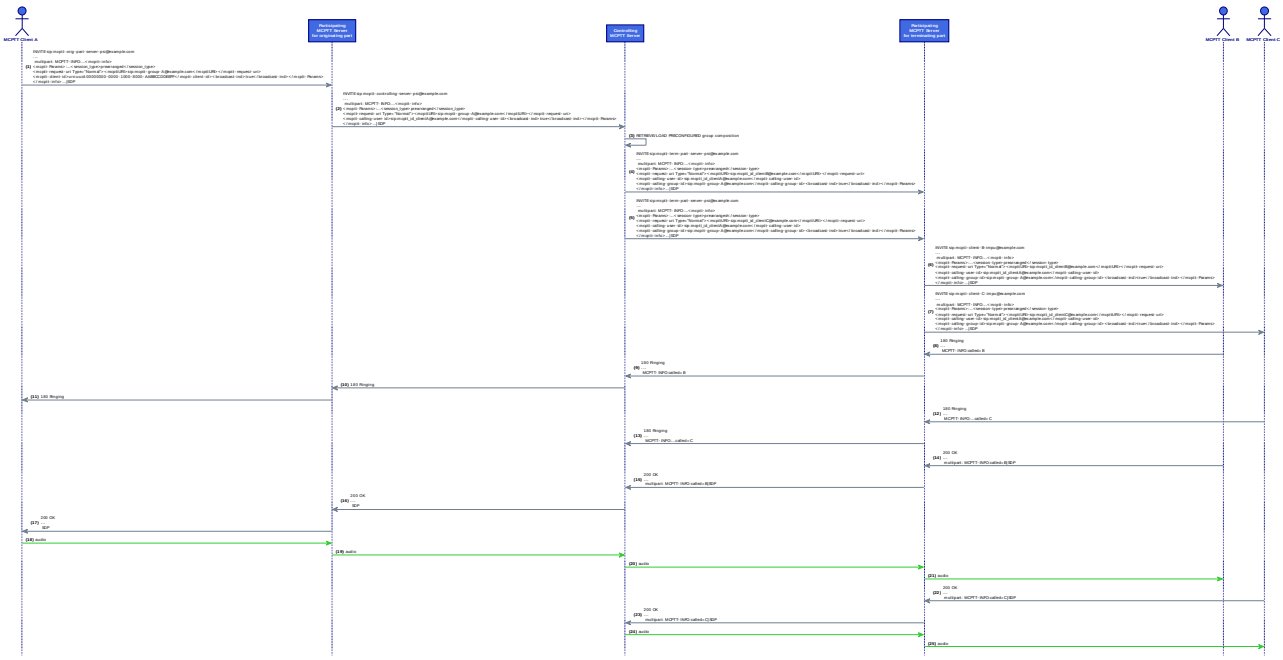

Figure 16: CONN-MCPTT/ONN/GROUP/PREA/ONDEM/NFC/04 Message Sequence

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">
      <mcpttString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttString>
    </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 20: CONN-MCPTT/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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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-MCPTT/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-MCPTT/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 [9]). 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

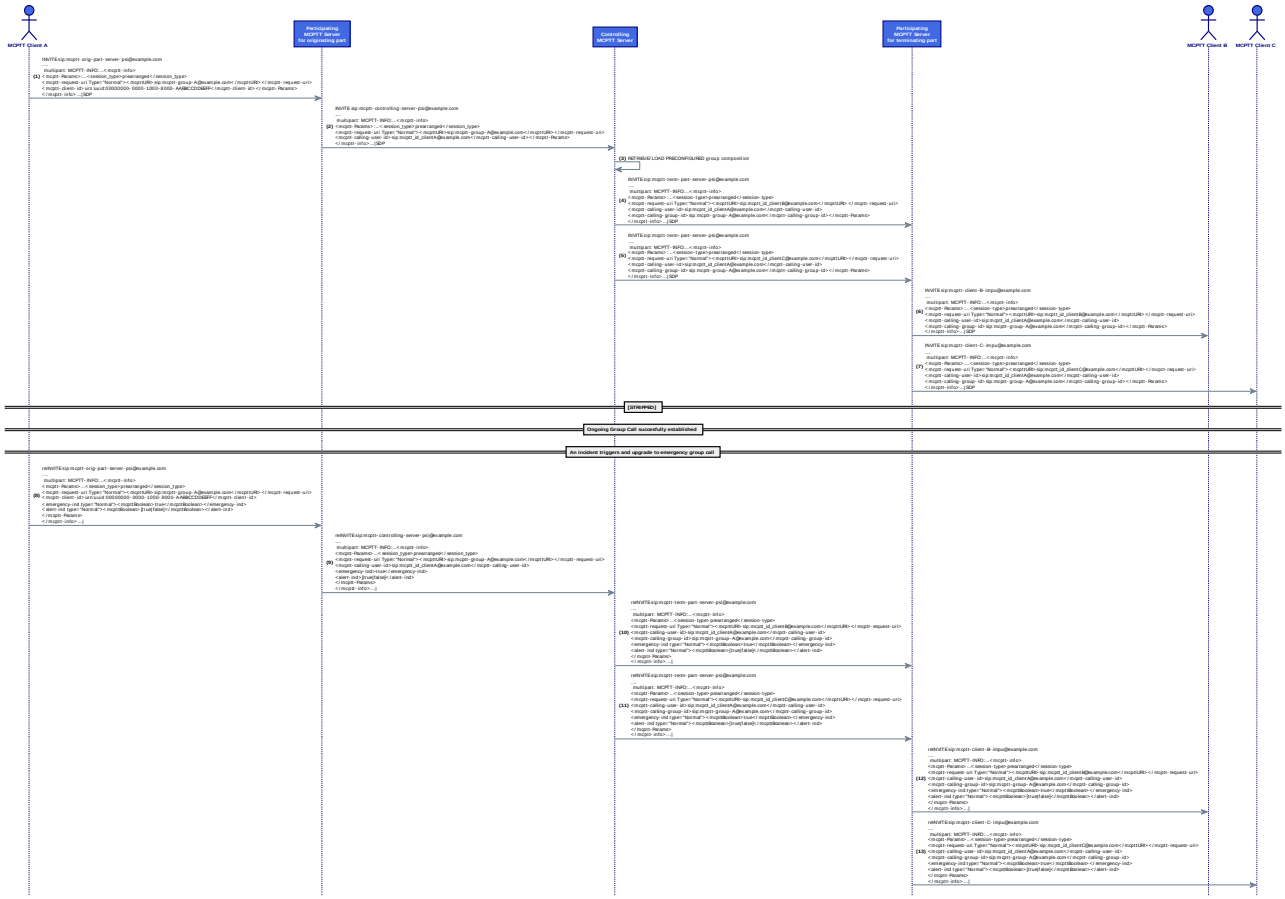

Figure 17: CONN-MCPTT/ONN/GROUP/PREA/ONDEM/NFC/05 Message Sequence

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%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-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"><mcpttString>urn:uuid:00000000-0000-1000-8000-
      AABBCCDDEEFF</mcpttString>
     </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 21: CONN-MCPTT/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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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-MCPTT/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 [9]). 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 [9].

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

Message Sequence Diagram

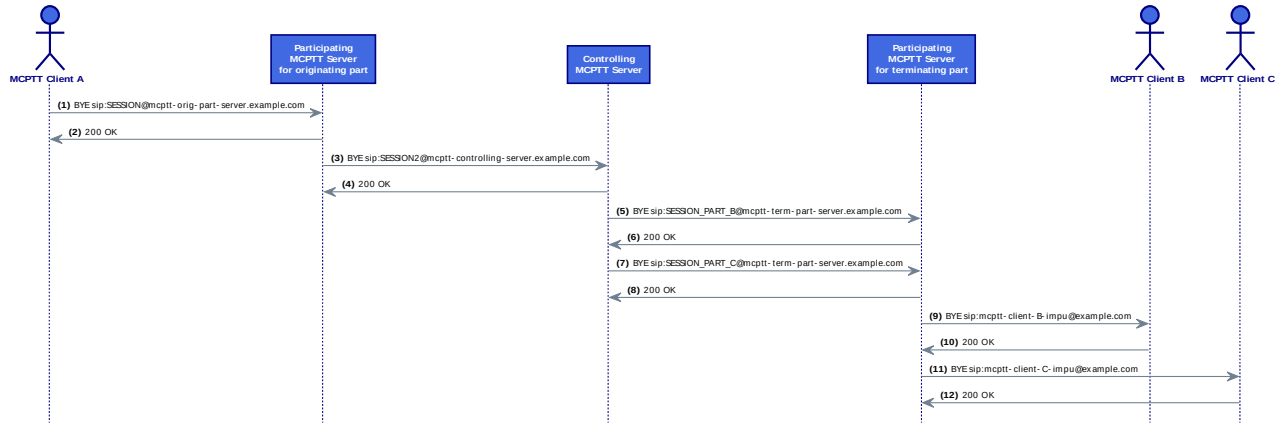

Figure 18: CONN-MCPTT/ONN/GROUP/PREA/ONDEM/NFC/06 Message Sequence

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 22: CONN-MCPTT/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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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-MCPTT/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 [25] and updated by IETF RFC 6665 [34] and IETF RFC 7647 [35].

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

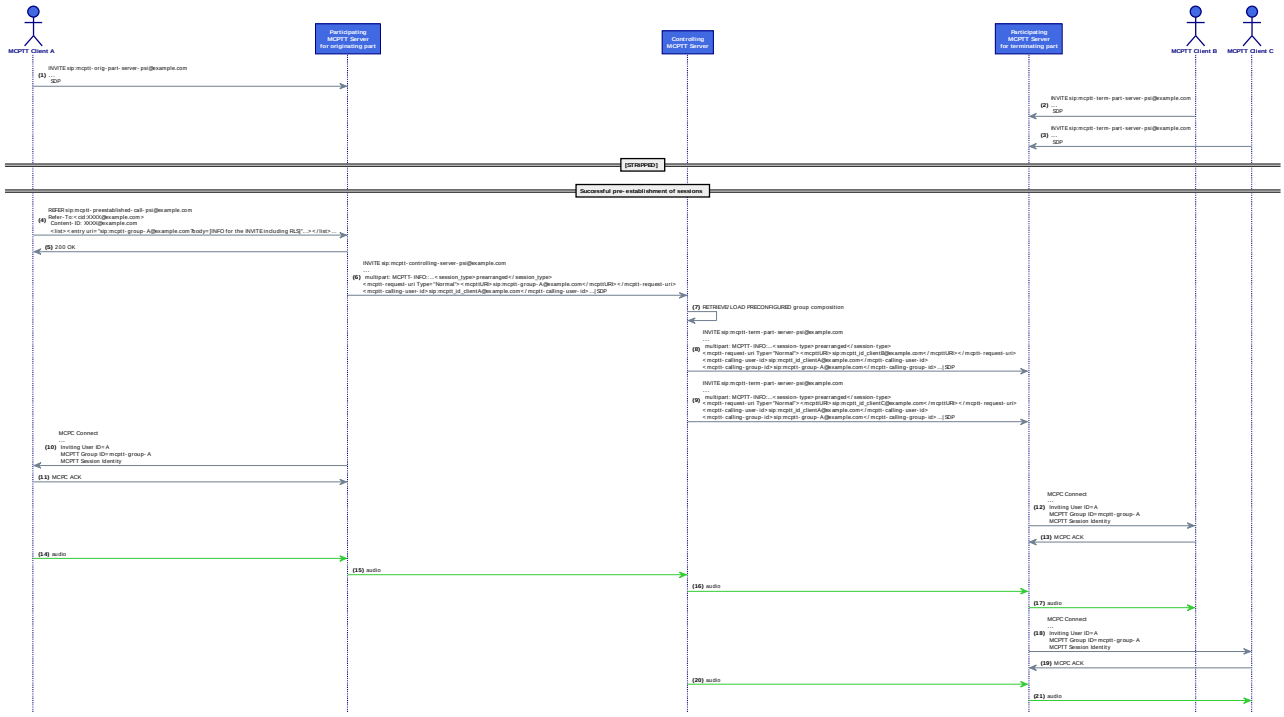

Figure 19: CONN-MCPTT/ONN/GROUP/PREA/PRE/NFC/01 Message Sequence

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 23: CONN-MCPTT/ONN/GROUP/PREA/PRE/NFC/01 ITD

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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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-MCPTT/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 [9] 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 [9] the participating MCPTT function shall then interact with the media plane resources towards the MCPTT client as specified in ETSI TS 124 380 [10] and maintain the pre-established session towards the MCPTT client.

Message Sequence Diagram

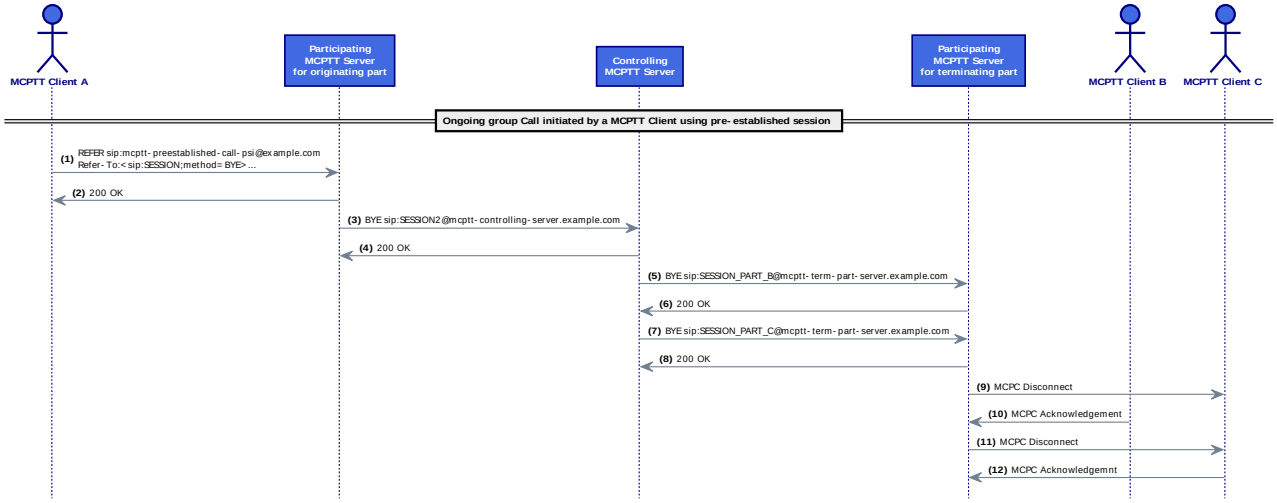

Figure 20: CONN-MCPTT/ONN/GROUP/PREA/PRE/NFC/02 Message Sequence

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 24: CONN-MCPTT/ONN/GROUP/PREA/PRE/NFC/02 ITD

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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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-MCPTT/ONNGROUP/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 [9] 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

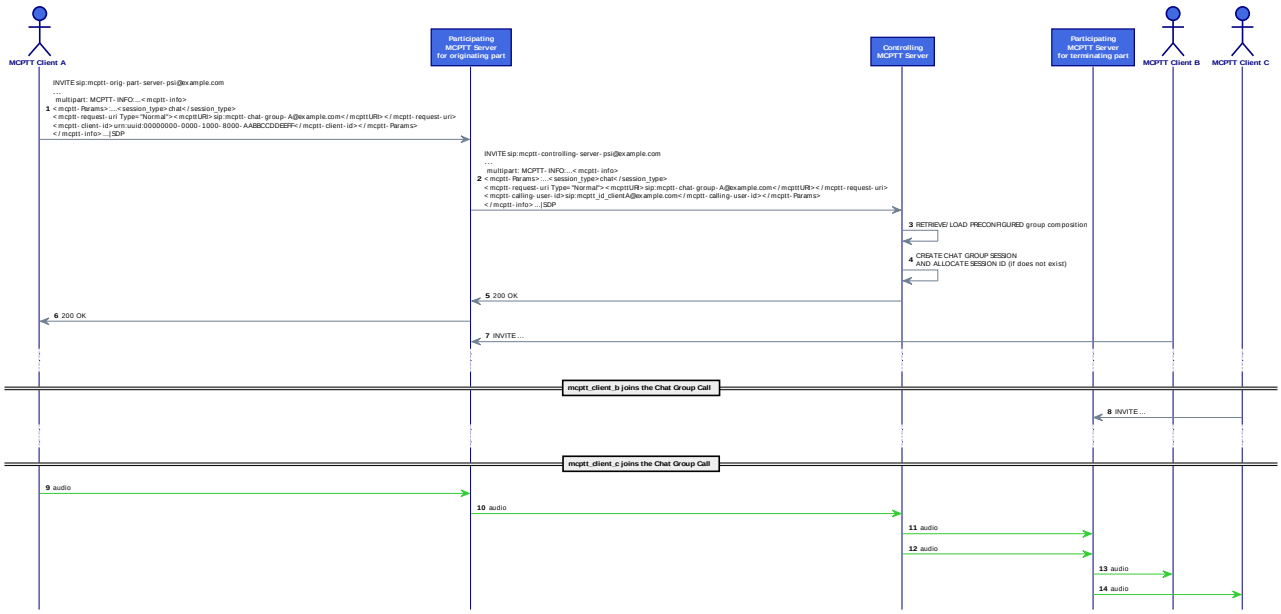

Figure 21: CONN-MCPTT/ONNGROUP/CHAT/ONDEM/NFC/01 Message Sequence

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">
      <mcpttString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttString>
    </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 25: CONN-MCPTT/ONNGROUP/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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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-MCPTT/ONN/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-MCPTT/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 [9].

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

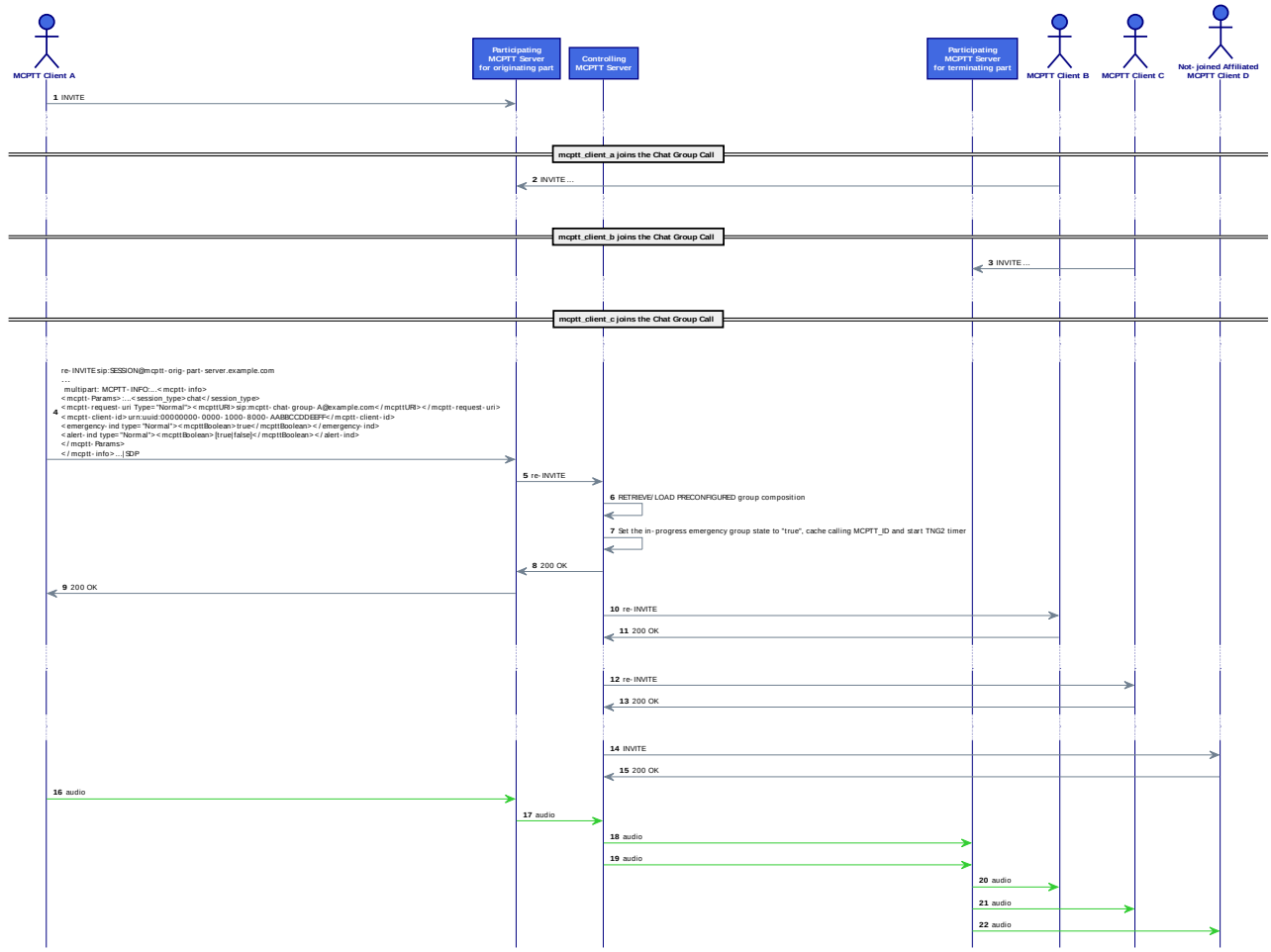

Figure 22: CONN-MCPTT/ONN/GROUP/CHAT/ONDEM/NFC/02 Message Sequence

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">
      <mcpttString>sip:mcptt-group-A@example.com</mcpttString>
    </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 26: CONN-MCPTT/ONN/GROUP/CHAT/ONDEM/NFC/02 ITD

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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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-MCPTT/ONN/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-MCPTT/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 [9].

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

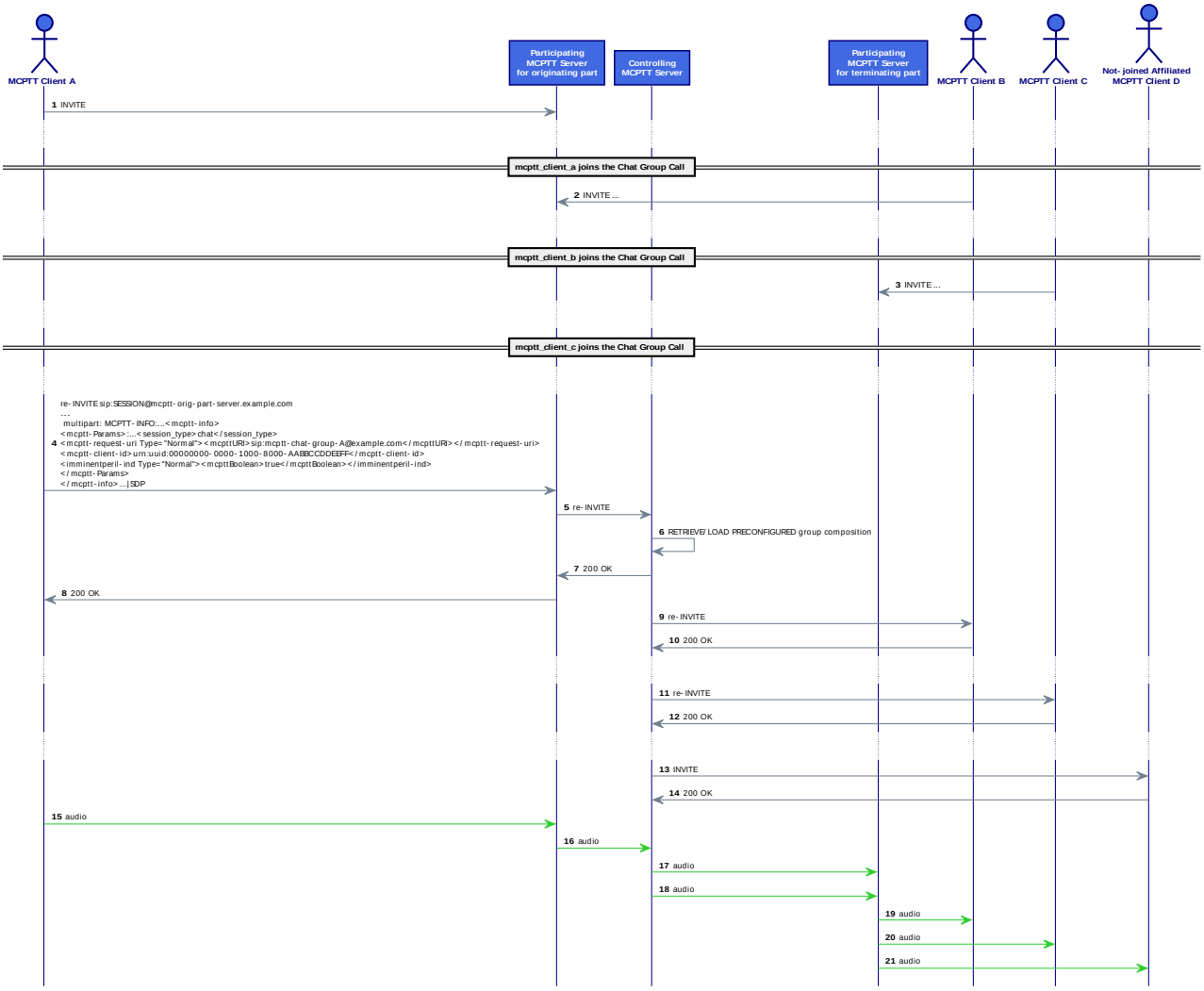

Figure 23: CONN-MCPTT/ONN/GROUP/CHAT/ONDEM/NFC/03 Message Sequence

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">
      <mcpttString>sip:mcptt_id_clientA@example.com</mcpttString>
    </mcptt-calling-user-id>

<imminentperil-ind Type="Normal">
<mcpttBoolean>true</mcpttBoolean>
</imminentperil-ind>
  </mcptt-Params>
</mcpttinfo>

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

Interoperability Test Description

Table 27: CONN-MCPTT/ONN/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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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-MCPTT/ONN/GROUP/CHAT/ONDEM/NFC/04]

This test covers the cancellation by a 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 [9]. 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

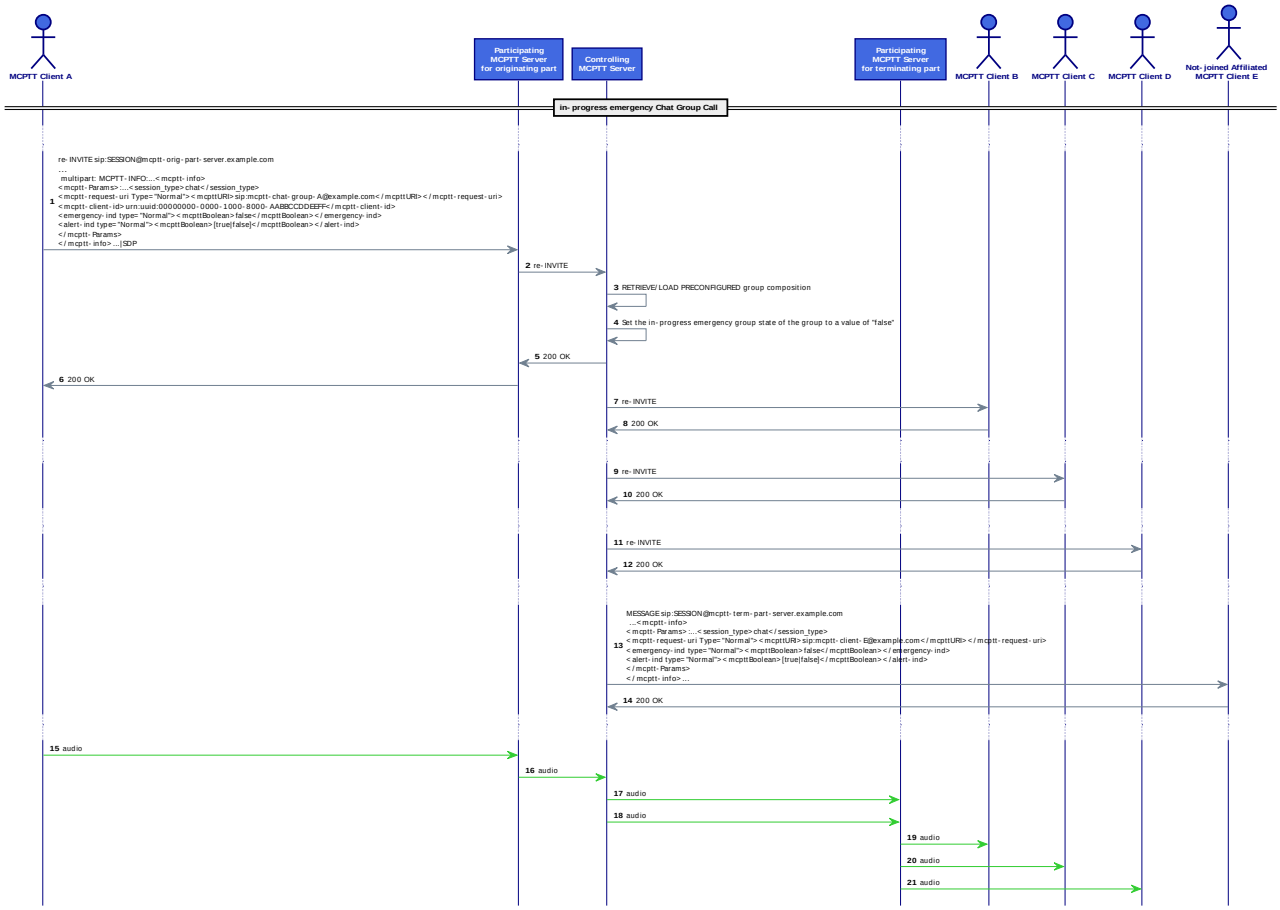

Figure 24: CONN-MCPTT/ONN/GROUP/CHAT/ONDEM/NFC/04 Message Sequence

Message Details

```
[1] 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">
      <mcpttString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttString>
    </mcptt-client-id>
    <broadcast-ind>true</broadcast-ind>
  </mcptt-Params>
</mcpttinfo>
--[boundary]
```

```
[13] MESSAGE MCPTT-Participating --> Affiliated but not joined User
MESSAGE sip:SESSION@mcptt-term-part-server.example.com
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>chat</session-type>
<mcptt-request-uri type="Normal">
<mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
</mcptt-request-uri>
<mcptt-client-id type="Normal">
<mcpttString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttString>
</mcptt-client-id>
<emergency-ind type="Normal">
<mcpttBoolean>false</mcpttBoolean>
</emergency-ind>
<alert-ind type="Normal">
<mcpttBoolean>[true|false]</mcpttBoolean>
</alert-ind>
</mcptt-Params>
</mcpttinfo>
```

Interoperability Test Description

Table 28: CONN-MCPTT/ONN/GROUP/CHAT/ONDEM/NFC/04 ITD

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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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-MCPTT/ONNGROUP/CHAT/ONDEM/NFC/05]

This test covers the cancellation by a User of the in-progress imminent-peril condition of a 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 [9].

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

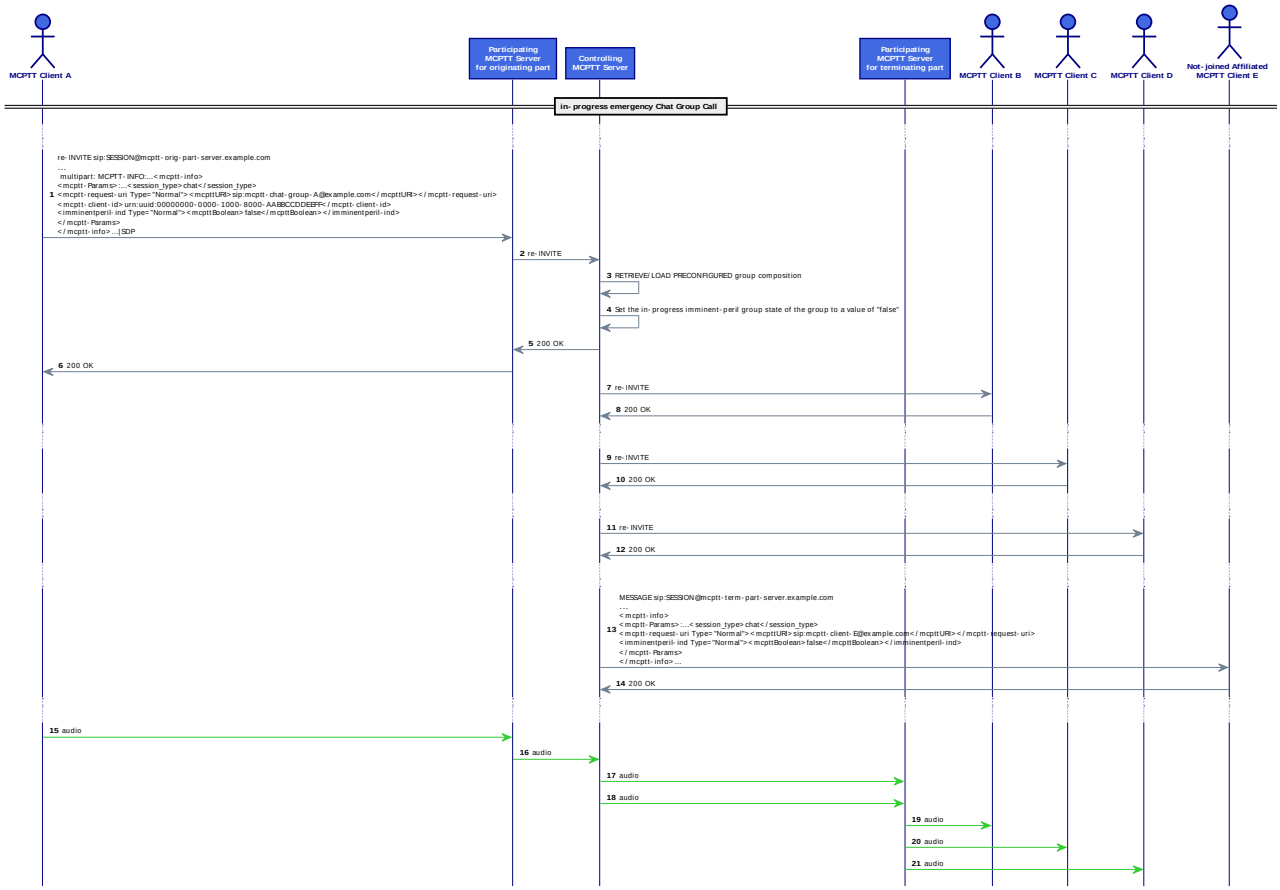

Figure 25: CONN-MCPTT/ONN/GROUP/CHAT/ONDEM/NFC/05 Message Sequence

Message Details

```
[1] re-INVITE MCPTT Caller/UE --> MCPTT Participating
[re]INVITE sip:SESSION@-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%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-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>chat</session-type>
<mcptt-request-uri type="Normal">
<mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
</mcptt-request-uri>
<mcptt-client-id type="Normal">
<mcpttString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttString>
</mcptt-client-id>
<imminentperil-ind Type="Normal">
<mcpttBoolean>true</mcpttBoolean>
```

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

[13] MESSAGE MCPTT-Participating --> Affiliated but not joined User
MESSAGE sip:SESSION@mcptt-term-part-server.example.com
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>chat</session-type>
<mcptt-request-uri type="Normal">
<mcpttURI>sip:mcptt-group-A@example.com</mcpttURI>
</mcptt-request-uri>
<mcptt-client-id type="Normal">
<mcpttString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF</mcpttString>
</mcptt-client-id>
<imminentperil-ind Type="Normal">
<mcpttBoolean>false</mcpttBoolean>
</imminentperil-ind>
</alert-ind>
</mcptt-Params>
</mcpttinfo>
```

Interoperability Test Description

Table 29: CONN-MCPTT/ONN/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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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-MCPTT/ONNGROUP/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 [9].

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

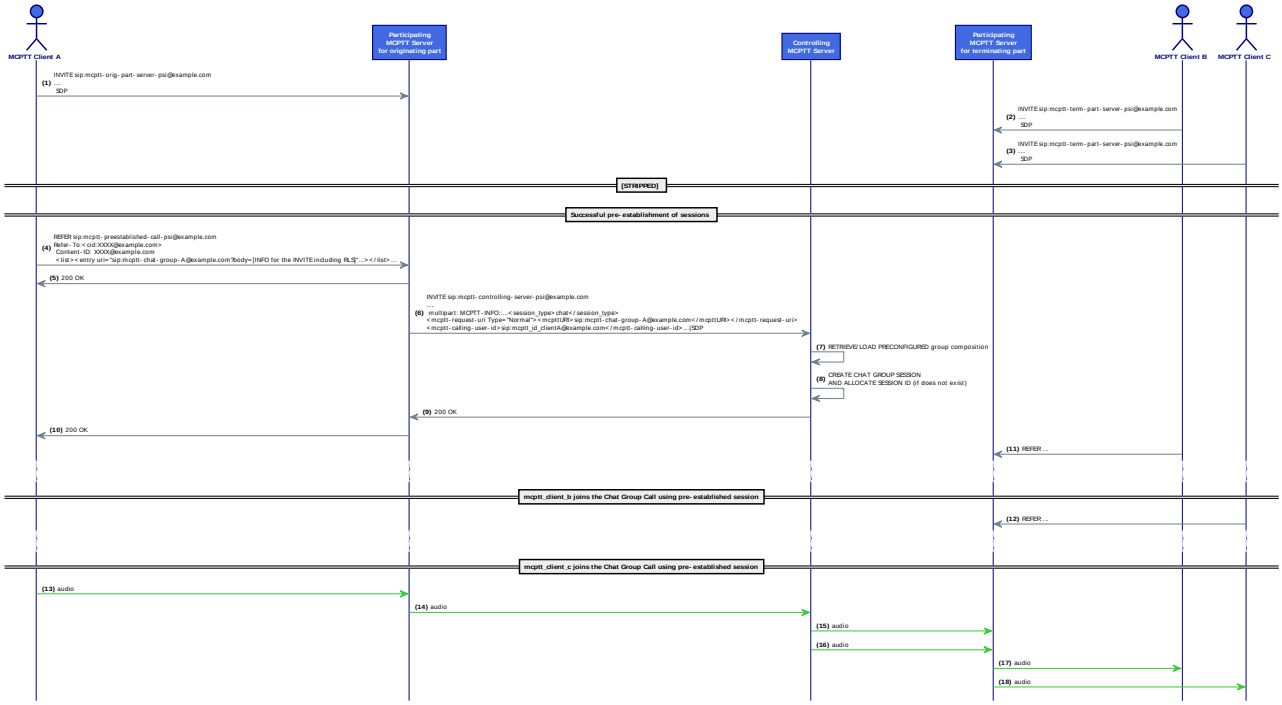

Figure 26: CONN-MCPTT/ONN/GROUP/CHAT/PRE/NFC/01 Message Sequence

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%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;Answer-Mode=Auto&amp; Content-
Type=multipart%2Fmixed%3Bboundary%3DYKP42ALY6Zy3ey" cc:copyControl="to"/>
</list>
</resource-lists>
```

Interoperability Test Description

Table 30: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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-MCPTT/ONN/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 123 379 [4]. Specific procedures for private calls with floor control are defined in clause 11.1.1 in ETSI TS 124 379 [9].

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 depict the half/full duplex conversation, therefore FC mechanisms will be omitted.

The automatic commencement mode indicates the terminating Client will take the call without interacting with the User (see IETF RFC 5373 [31] 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 [9]).

Message Sequence Diagram

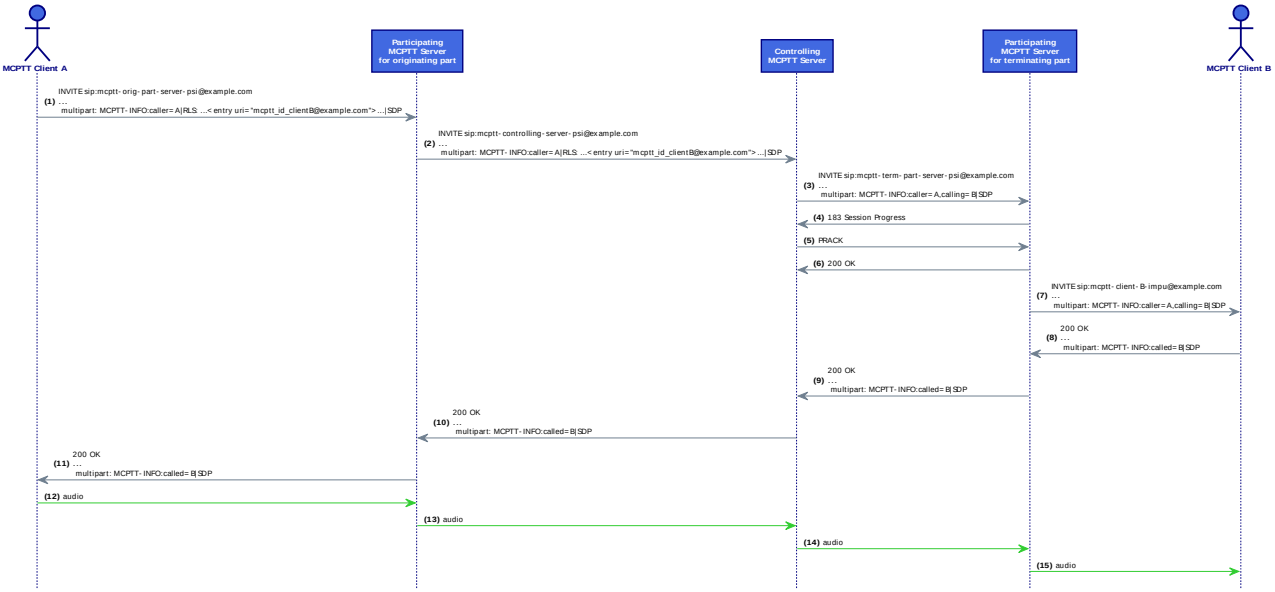

Figure 27: CONN-MCPTT/ONN/PRIV/AUTO/ONDEM/WFC/NFC/01 Message Sequence

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%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
[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="mcptt_id_clientB@example.com" cc:copyControl="to"/> </list>
</resource-lists>
--[boundary]
Content-Type: application/sdp ...
--[boundary]--
```

Interoperability Test Description

Table 31: CONN-MCPTT/ONN/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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 mode with floor control [CONN-MCPTT/ONN/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 [31] while in test CONN-MCPTT/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

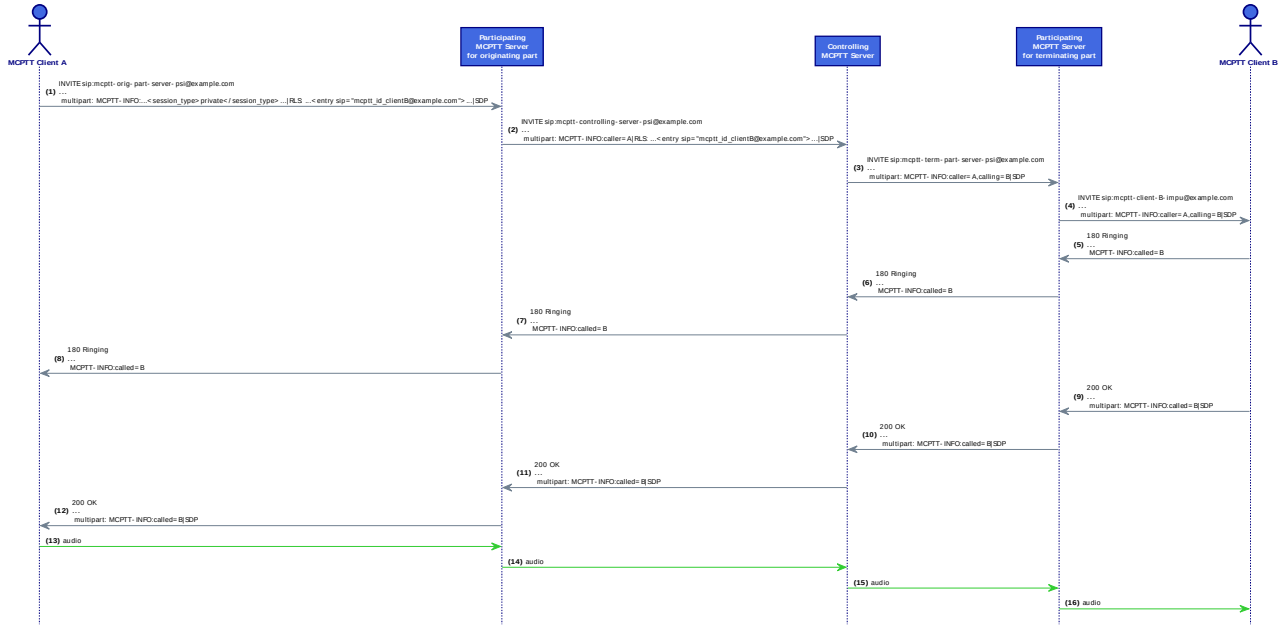

Figure 28: CONN-MCPTT/ONN/PRIV/MANUAL/ONDEM/WFC/NFC/01 Message Sequence

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 32: CONN-MCPTT/ONN/PRIV/MANUAL/ONDEM/WFC/NFC/01 ITD

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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 mode with floor control [CONN-MCPTT/ONN/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 123 379 [4]. Most procedures are described in clause 8 (for pre-establishment), clause 11.1.1.2.2 (for private call) in ETSI TS 124 379 [9] and clause 9 in ETSI TS 124 380 [10] (for Floor Controlling mechanisms).

According to clause 10.5 in ETSI TS 123 379 [4] 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 [9], and the procedures specified in ETSI TS 124 380 [10].
- MCPTT server: procedures specified in clauses 8.2.2, 8.3.2 and 8.4.2 in ETSI TS 124 379 [9], and the procedures specified in ETSI TS 124 380 [10].

Message Sequence Diagram

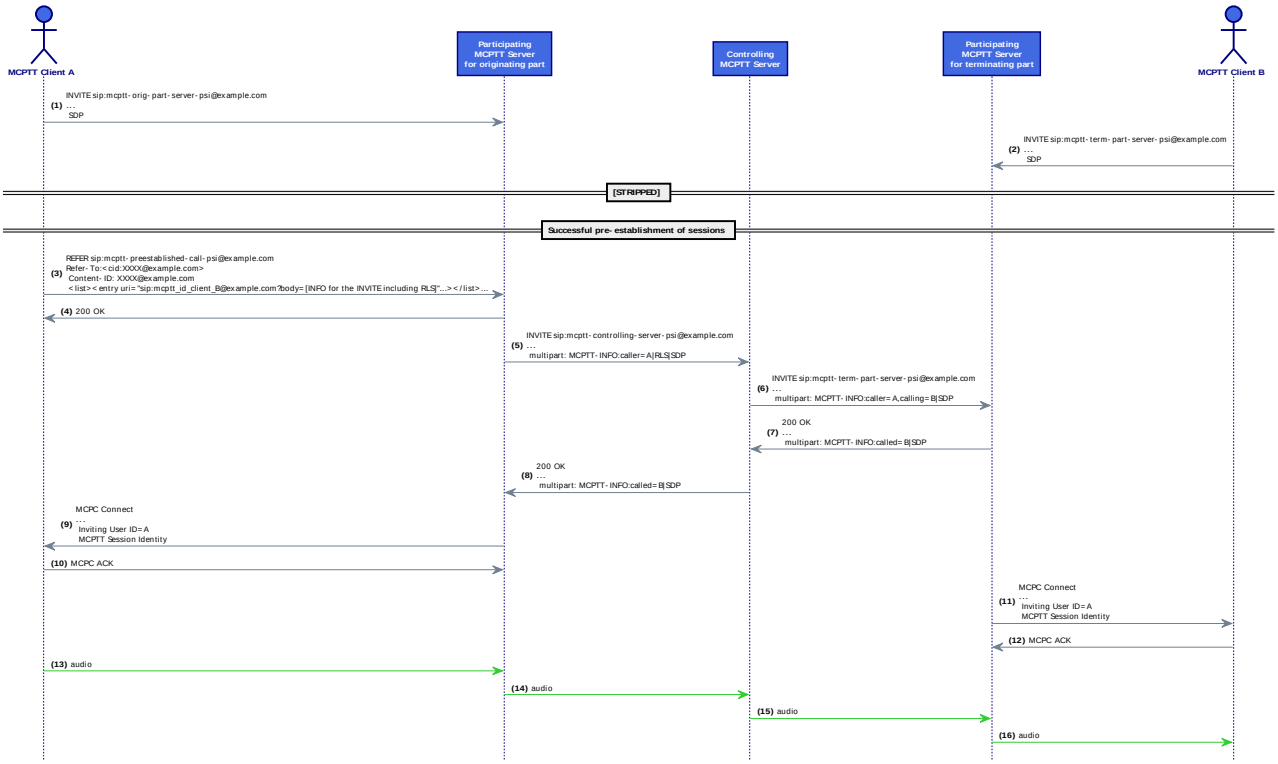

Figure 29: CONN-MCPTT/ONN/PRIV/AUTO/PRE/WFC/NFC/01 Message Sequence

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%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%0
AContent-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%3
C%2Fsession-type%3E%0A%20%20%20%20%3Cmcptt-calling-user-id%3
Esip: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%0
A--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%3
Cresource-lists%20xmlns%3D%22urn%3Aietf%3Aparams%3Axml%3Ans%3
Aresource-lists%22%20xmlns%3Acc%3D%22urn%3Aietf%3Aparams%3Axml%3Ans%3
Acopycontrol%22%3E%0A%20%20%3Clist%3E%0A%20%20%20%20%3Centry%20uri%3D%22
sip: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%0
AContent-Type%3A%20application%2Fsdp%0A%0Av%3D0%0Ao%3DMCPTTCLIENT
%2011838117312042482724452 0IN%20IP4%20IP%0As%3D-%0Ac%3DIN%20IP4%20IP%0At
%3D0%200%0Am%3Daudio%2012000%20RTP%2FAVP%2099%0Aa%3Dlabel%3A1%0Ai%3Dspeech
%0Aa%3Drtpmap%3A99%20AMR-WB%2F16000%2F1%0Aa%3Dfmtp%3A99%20 mode-change-period%3D1%3B%20mode-change-
capability%3D2%3B%20
mode-change-neighbor%3D0%3B%20max-red%3D0%0Aa%3Dptime%3A20%0Aa%3Dmaxptime%3
A240%0Am%3Dapplication%201234%20udp%20MCPTT%0Aa%3Dfmtp%3AMCPTT%20
mc_queueing%3Bmc_priority%3D5%3Bmc_implicit_request%0A%0A--YKP42ALY6Zy3ey-&amp;Answer-
Mode=Auto&amp;Content-Type=multipart%2Fmixed%3Bboundary%3 DYKP42ALY6Zy3ey" cc:copyControl="to"/>
</list>
</resource-lists>
```

Interoperability Test Description

Table 33: CONN-MCPTT/ONN/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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])
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 mode with floor control [CONN-MCPTT/ONN/PRIV/MANUAL/PRE/WFC/NFC/01]

As specified in clause 6.3.2.2.6.3 of ETSI TS 124 379 [9] 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 [10], annex A.

Message Sequence Diagram

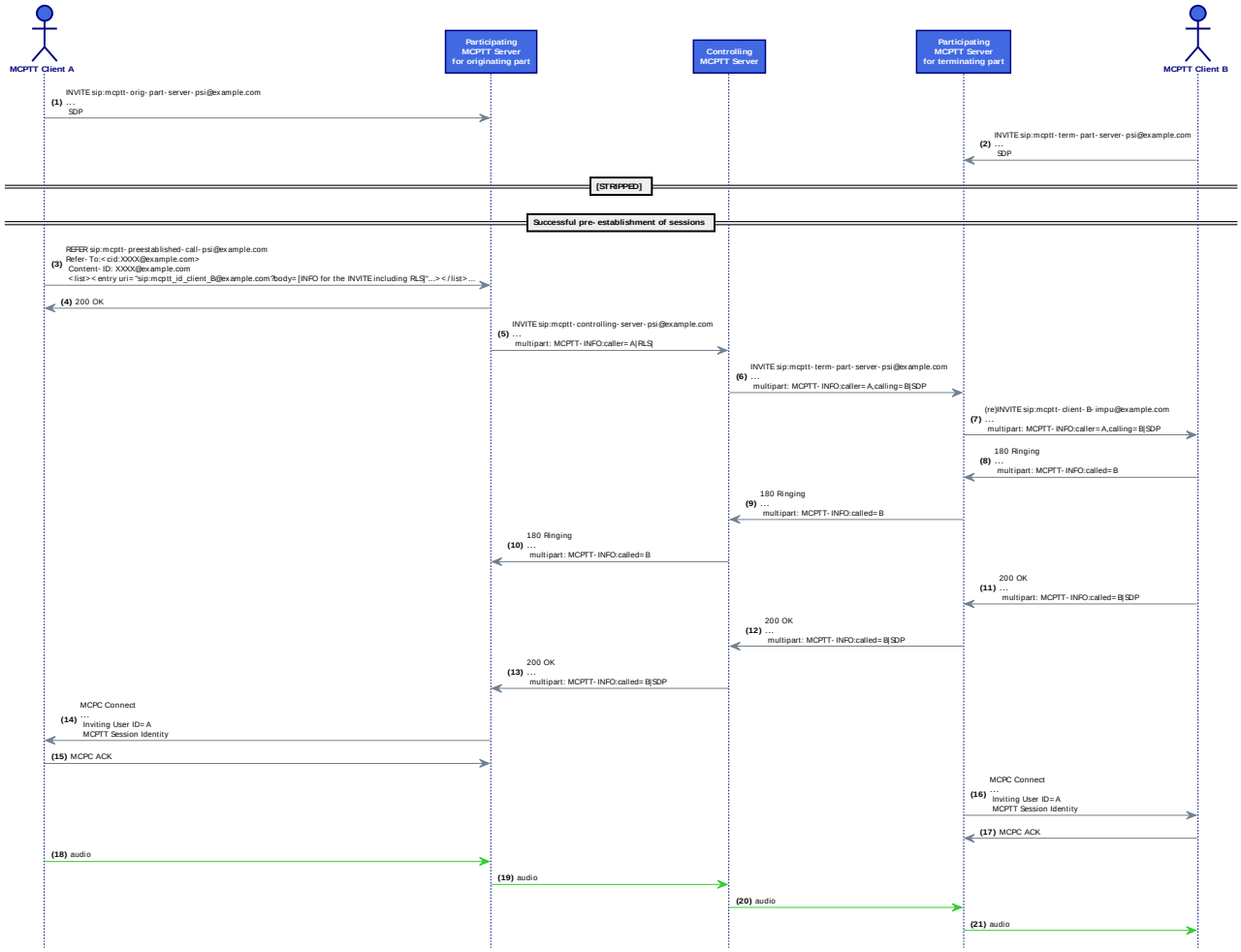

Figure 30: CONN-MCPTT/ONN/PRIV/MANUAL/PRE/WFC/NFC/01 Message Sequence

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 34: CONN-MCPTT/ONN/PRIV/MANUAL/PRE/WFC/NFC/01

Interoperability Test Description			
Identifier	CONN/ONN/PRIV/MANUAL/PRE/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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 mode without floor control [CONN-MCPTT/ONN/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 123 379 [4]. Specific procedures for private calls without floor control are defined in clause 11.1.2 in ETSI TS 124 379 [9].

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 in ETSI TS 124 379 [9] (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

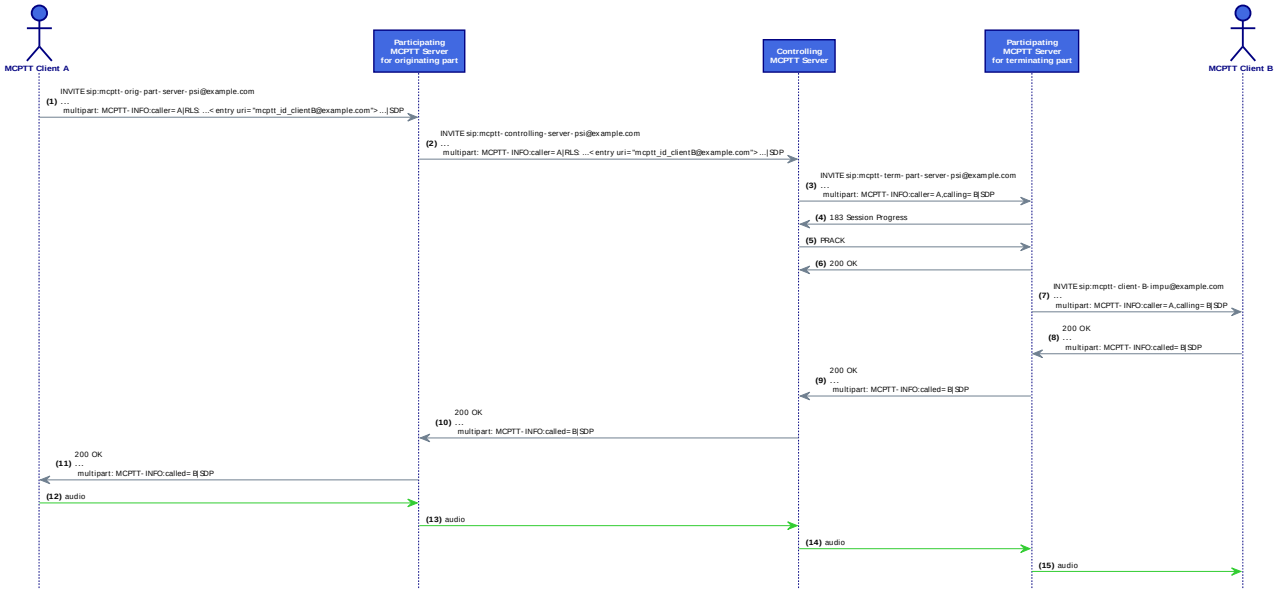

Figure 31: CONN-MCPTT/ONN/PRIV/AUTO/ONDEM/WOFC/01 Message Sequence

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%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 [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="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 35: CONN-MCPTT/PRIV/AUTO/ONDEM/WOFC/01 ITD

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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 mode without floor control [CONN-MCPTT/ONN/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 36: CONN-MCPTT/ONN/PRIV/MANUAL/ONDEM/WOFC/01 ITD

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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 mode without floor control [CONN-MCPTT/ONN/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 37: CONN-MCPTT/ONN/PRIV/AUTO/PRE/WOFC/01 ITD

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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 mode without floor control [CONN-MCPTT/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 38: CONN/ONN/PRIV/MANUAL/ONDEM/WOFC/01 ITD

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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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

7.2.23 MCPTT User initiates an on-demand first-to-answer MCPTT call with floor control [CONN-MCPTT/ONN/FIRST/MANUAL/ONDEM/WFC/NFC/01]

This test covers a first-to-answer call equivalent to CONN-MCPTT/ONN//PRIV/MANUAL/ONDEM/WFC/NFC/01 described in clause 7.2.16. Therefore, the call is actually started when the first MCPTT user among multiple potential target recipients answers following the procedures described in clauses 11.1.1.2.1, 11.1.1.3.1.1 and 11.1.1.4 in [9] and according to rules and procedures in IETF RFC 5366 [30].

Message Sequence Diagram

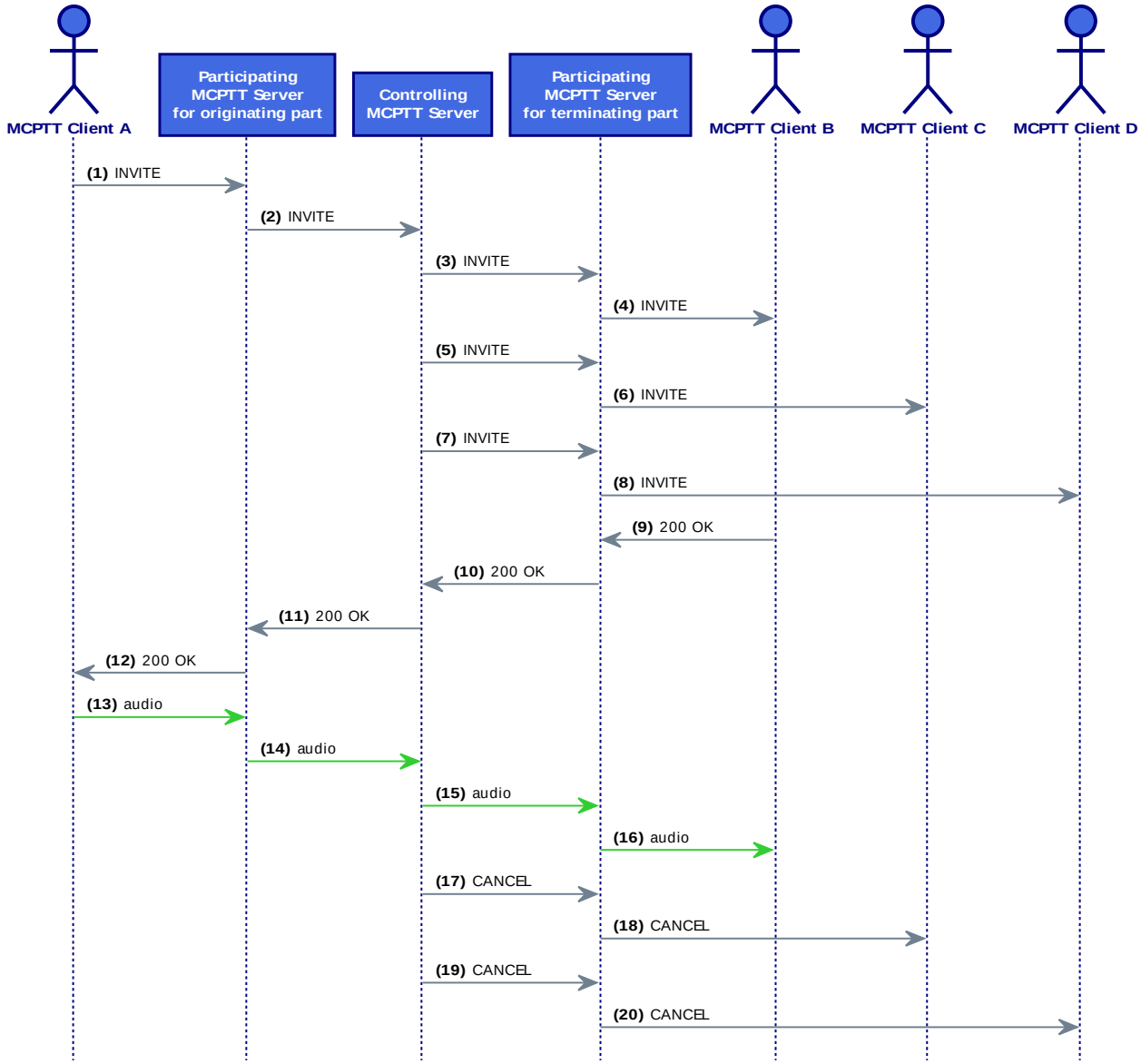

Figure 32: CONN-MCPTT/ONN/FIRST/MANUAL/ONDEM/WFC/NFC/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 39: CONN-MCPTT/ONN/FIRST/MANUAL/ONDEM/WFC/NFC/01 ITD

Interoperability Test Description			
Identifier	CONN-MCPTT/ONN/FIRST/MANUAL/ONDEM/WFC/NFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a first-to-answer 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-Rel14, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-Rel14, MCPTT-Part_AFFIL MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-Rel14, MCPTT-Ctrl_AFFIL (clause 6.8)		
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 a list of users (User 2, 3, 4...) (mcptt_id_clientB,C,D...@example.com)
	2	check	Dialog creating INVITE received at the MCPTT participating server of User1
	3	check	The participating server eventually adapts the resource-list and creates an INVITE to the controlling server
	4	check	The controlling server check permissions and forward the INVITE to the participating server(s) of the callee(s)
	5	check	Upon arrival of the INVITE adapted by the terminating participating function to the terminating first-to-answer Client User 2 is notified
	6	check	User 2 accepts the private call and all the signalling is completed
	7	check	Upon notification of the first-answering-callee the rest of dialogs are cancelled
	8	verify	Call connected and media flows exchanged

7.2.24 MCPTT User initiates an on-demand first-to-answer MCPTT call without floor control [CONN-MCPTT/ONN/FIRST/MANUAL/ONDEM/WOFC/01]

This test covers a first-to-answer call equivalent to CONN-MCPTT/ONN_OTT/FIRST/MANUAL/ONDEM/WFC/NFC/01 described in clause 7.2.23. Clause 11.1.2 in ETSI TS 124 379 [9] describes the overall procedure, basically the same as the floor control case but with the following exceptions:

1) in step 12) of clause 11.1.1.2.1.1 of ETSI TS 124 379 [9] the MCPTT client shall not offer a media-level section for a media-floor control entity; and

2) step 13) of clause 11.1.1.2.1.1 ETSI TS 124 379 [9] shall be ignored.

Message Sequence Diagram

Check figure 32.

Message Details

Check clause 7.2.23 but with a SDP with no m=application XXXX udp MCPTT media floor control entity.

Interoperability Test Description

Table 40: CONN-MCPTT/ONN/FIRST/MANUAL/ONDEM/WOFC/01 ITD

Interoperability Test Description			
Identifier	CONN-MCPTT/ONN/FIRST/MANUAL/ONDEM/WOFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a first-to-answer 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-Rel14, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-Rel14, MCPTT-Part_AFFIL MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-Rel14, MCPTT-Ctrl_AFFIL (clause 6.8)		
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 a list of users User 2, 3, 4... (mcptt_id_clientB,C,D...@example.com)
	2	check	Dialog creating INVITE (without FC) received at the MCPTT participating server
	3	check	The participating server eventually adapts the resource-list and creates an INVITE to the controlling server
	4	check	The controlling server check permissions and forward the INVITE to the participating server(s) of the callee(s)
	5	check	Upon arrival of the INVITE adapted by the terminating participating function to the terminating first-to-answer Client User 2 is notified
	6	check	User 2 accepts the private call and all the signalling is completed
	7	check	Upon notification of the first-answering-callee the rest of dialogs are cancelled
	8	verify	Call connected and media flows exchanged

7.2.25 MCPTT User initiates an on-demand first-to-answer MCPTT call with floor control using pre-established sessions [CONN-MCPTT/ONN/FIRST/MANUAL/PRE/WFC/NFC/01]

This test covers a first-to-answer call equivalent to CONN-MCPTT/ONN/FIRST/MANUAL/ONDEM/WFC/NFC/01 described in clause 7.2.23 but using pre-established sessions (therefore, using the session establishment mechanism and later REFER message and MCPC protocol as in CONNMCPTT/ONN/PRIV/MANUAL/PRE/WFC/NFC/01, clause 7.2.18). All the procedure are described in clauses 11.1.1.2.2, 11.1.1.3.1.2, 11.1.3.2.2 and 11.1.1.4 in ETSI TS 124 379 [9] and according to rules and procedures in IETF RFC 5366 [30].

Message Sequence Diagram

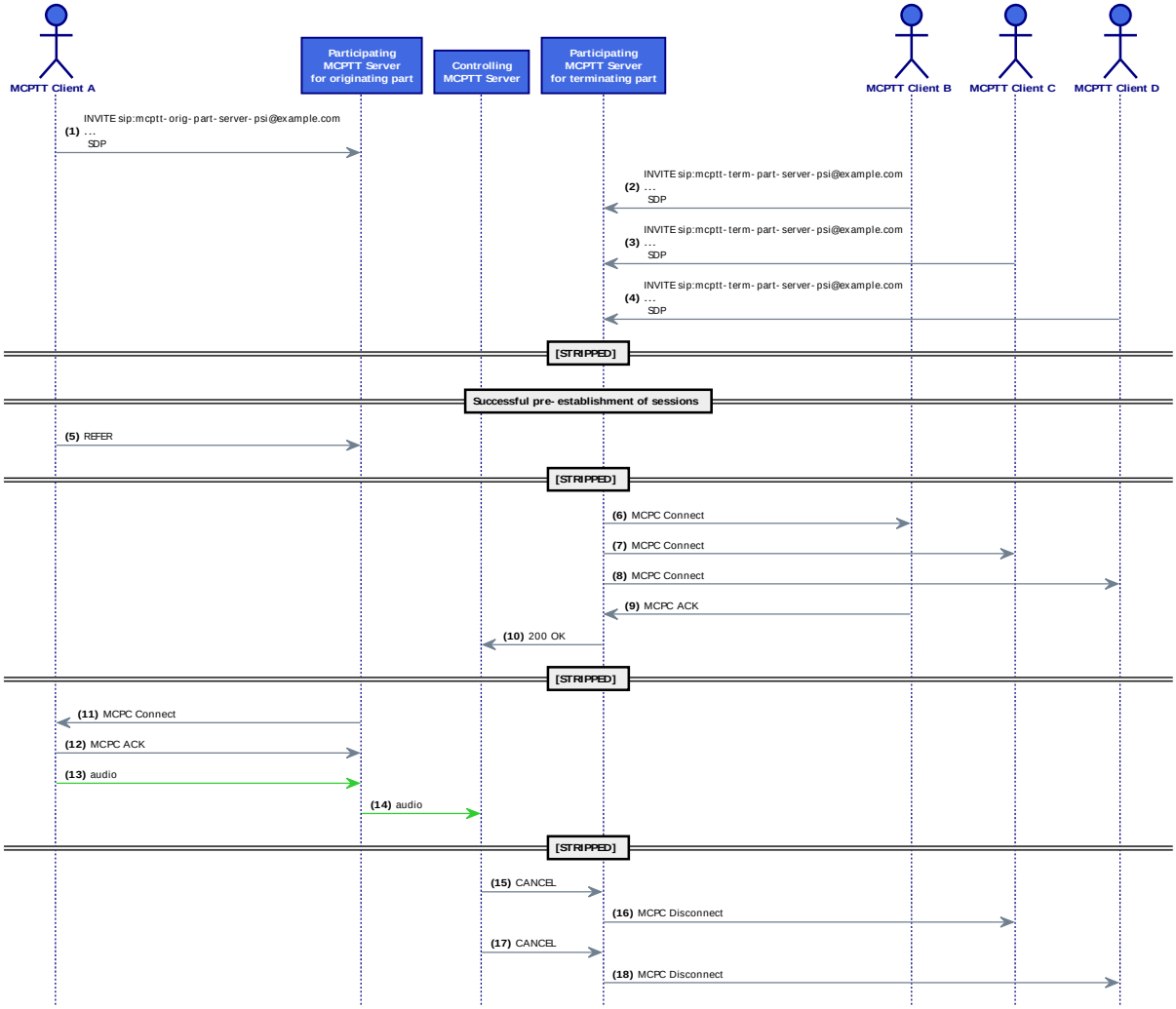

Figure 33: CONN-MCPTT/ONN/FIRST/MANUAL/PRE/WFC/NFC/01 Message Sequence

Message Details

Trace Pending

Table 41: CONN-MCPTT/ONN/FIRST/MANUAL/PRE/WFC/NFC/01 ITD

Interoperability Test Description			
Identifier	CONN-MCPTT/ONN/FIRST/MANUAL/PRE/WFC/NFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a first-to-answer 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-Rel14, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-Rel14, MCPTT-Part_AFFIL MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-Rel14, MCPTT-Ctrl_AFFIL (clause 6.8)		
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) preestablishes a session
	2	check	Pre-established session is established
	3	check	The rest of Users successfully complete the pre-establishment of their sessions
	4	stimulus	User 1 (mcptt_id_clientA@example.com) calls a list of users User 2, 3, 4... (mcptt_id_clientB,C,D...@example.com)
	5	check	Dialog creating REFER received at the MCPTT participating server of User1
	6	check	The participating server eventually adapts the resource-list and creates an INVITE to the controlling server
	7	check	Upon notification of the first-answering-callee the rest of dialogs are cancelled
	8	verify	Call connected and media flows exchanged

7.2.26 MCPTT User initiates a pre-established first-to-answer MCPTT call in manual commencement mode without floor control [CONN-MCPTT/ONN/FIRST/MANUAL/PRE/WOFC/01]

Equivalent test to that in clause 7.2.25 but with no media-level section for the media floor control entity in the exchanged SDPs.

Message Sequence Diagram

Check figure 30.

Message Details

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

Table 42: CONN-MCPTT/ONN/FIRST/MANUAL/PRE/WOFC/01 ITD

Interoperability Test Description			
Identifier	CONN-MCPTT/ONN/FIRST/MANUAL/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 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-Rel14, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-Rel14, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-Rel14, MCPTT-Ctrl_AFFIL (clause 6.8)		
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

7.2.27 MCPTT User setups a private-call callback [CONN-MCPTT/ONN/CALLBACK/SETUP-/01]

MCPTT user 1 initiates an MCPTT private call call-back request to the MCPTT user 2 following procedures in clause 11.1.5.2.1 in [9]. Upon successful authorization and forwarding of the request by the originating participating (clause 11.1.5.3.1) Controlling (clause 11.1.5.4) and terminating participating (clause 11.1.5.3.2) MCPTT Client 2 receives the call-back request (clause 11.5.1.2.2) and notifies the User accordingly.

Message Sequence Diagram

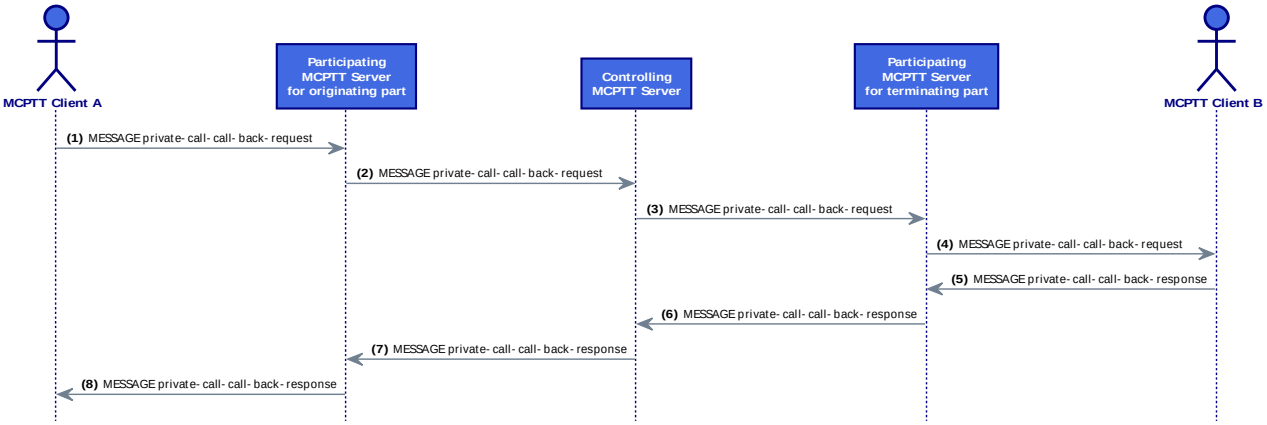

Figure 34: CONN-MCPTT/ONN/CALLBACK/SETUP/01 Message Sequence

Message Details

Trace Pending

Table 43: CONN-MCPTT/ONN/CALLBACK/SETUP/01 ITD

Interoperability Test Description			
Identifier	CONN-MCPTT/ONN/CALLBACK/SETUP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a first-to-answer 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-Rel14, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-Rel14, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-Rel14, MCPTT-Ctrl_AFFIL (clause 6.8)		
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) requests a private call call-back to mcptt_id_clientB@example.com
	2	check	SIP MESSAGE received at the MCPTT participating server of User1
	3	check	The participating server check rules, maps identities and forwards the message to the controlling server
	4	check	The controlling server forwards the MESSAGE to the participating server(s) of the called(s)
	5	check	The terminating participating server re-maps identities and forward the message to the target
	6	check	Client 2 notifies back the response
	7	verify	Call-back registered and User 2 notified

7.2.28 MCPTT User cancels a private-call callback [CONN-MCPTT/ONN/CALLBACK/CANCEL-/01]

Upon previous setup of private-call callback (see clause 7.2.27) the original caller initiates the cancellation of the call-back following procedures in clause 11.1.5 in ETSI TS 124 379 [9].

Message Sequence Diagram

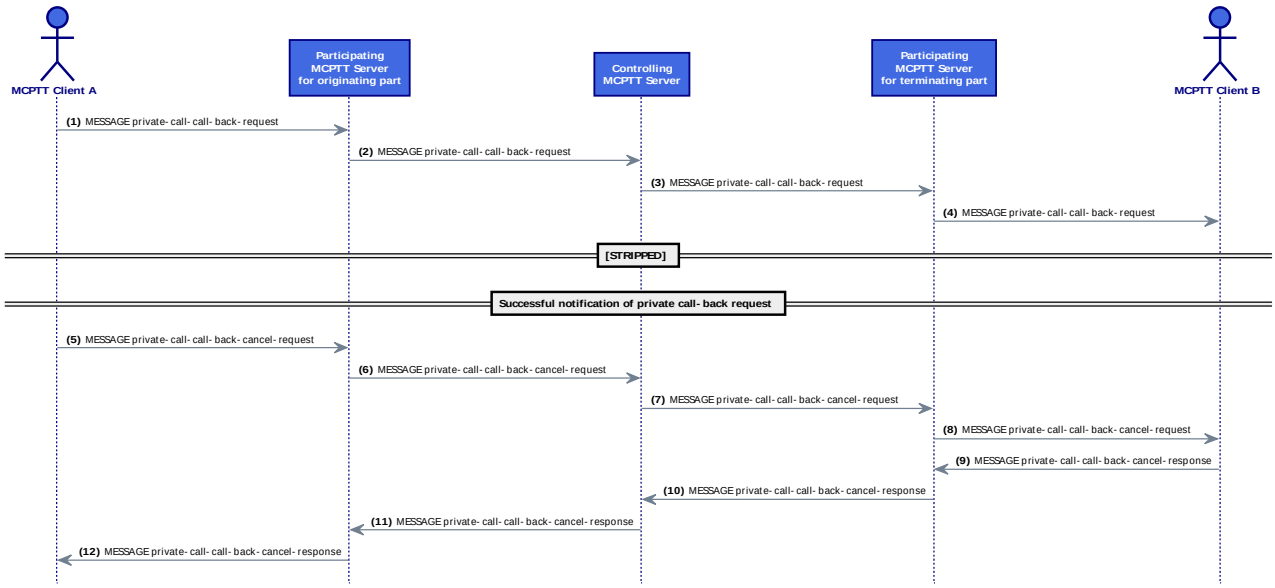

Figure 35: CONN-MCPTT/ONN/CALLBACK/CANCEL/01 Message Sequence

Message Details

Trace Pending

Table 44: CONN-MCPTT/ONN/CALLBACK/CANCEL/01 ITD

Interoperability Test Description			
Identifier	CONN-MCPTT/ONN/CALLBACK/CANCEL/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a first-to-answer 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-Rel14, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-Rel14, MCPTT-Part_AFFIL , MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-Rel14, MCPTT-Ctrl_AFFIL (clause 6.8)		
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 • Previous private call call-back received at User 2		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcptt_id_clientA@example.com) requests a private call call-back to mcptt_id_clientB@example.com
	2	check	SIP MESSAGE received at the MCPTT participating server of User1
	3	check	The participating server check rules, maps identities and forwards the message to the controlling server
	4	check	The controlling server forward is the MESSAGE to the participating server(s) of the callee(s)
	5	check	The terminating participating server re-maps identities and forward the message to the target
	6	check	Client 2 notifies back the response
	7	verify	Call-back de-registered and User 2 notified

7.2.29 MCPTT User fulfils a private-call callback [CONN-MCPTT/ONN/CALLBACK/FULFIL-/01]

Upon previous setup of private-call callback (see clause 7.2.27) the original callee initiates a private call to the original caller following procedures in clause 11.1.5.2.3 in ETSI TS 124 379 [9].

Message Sequence Diagram

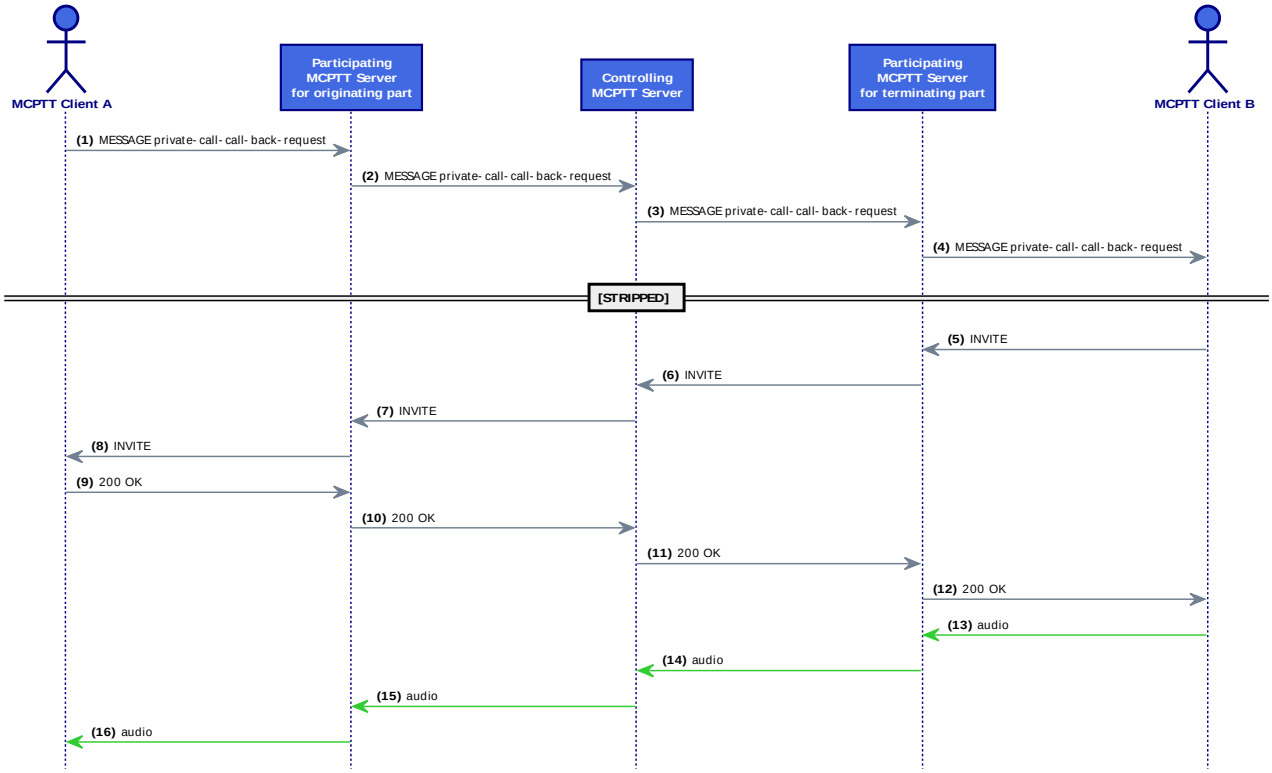

Figure 36: CONN-MCPTT/ONN/CALLBACK/FULFIL/01 Message Sequence

Message Details

Trace Pending

Table 45: CONN-MCPTT/ONN/CALLBACK/FULFIL/01 ITD

Interoperability Test Description	
Identifier	CONN-MCPTT/ONN/CALLBACK/FULFIL/01
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a first-to-answer 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])
Applicability	• MCPTT-Client_ONN-MCPTT-Rel14, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-Rel14, MCPTT-Part_AFFIL MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-Rel14, MCPTT-Ctrl_AFFIL (clause 6.8)
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 • Previous private call call-back received at User 2

Test Sequence	Step	Type	Description
	1	stimulus	User 2 (mcptt_id_clientB@example.com) requests an on-demand private call in manual commencement mode to mcptt_id_clientB@example.com
	2	check	SIP INVITE received at the MCPTT participating server of User 2
	3	check	Call successfully completed
	4	check	Client 2 changes internal status
	5	verify	Call-back de-registered and User 2 notified

7.2.30 MCPTT User setups locally an on-demand ambient listening call [CONN-MCPTT/ONN/AMBIENT/ONDEM/LOCAL/01]

The procedures for ambient listening calls. are applicable to both locally initiated and remotely initiated ambient listening call. In this test case an authorised MCPTT user initiates an ambient listening call in order to be listened to by the terminating user. The associated procedures are described in clause 11.1.6.2.1.1 in [9]. Being a locally initiated ambient listening call, it shall comply with the conditions for implicit floor control as specified in clause 6.4 in [9]. Participating server will follow procedures in clause 11.1.6.3 in [9], while Controlling clause 11.1.6.4.

Message Sequence Diagram

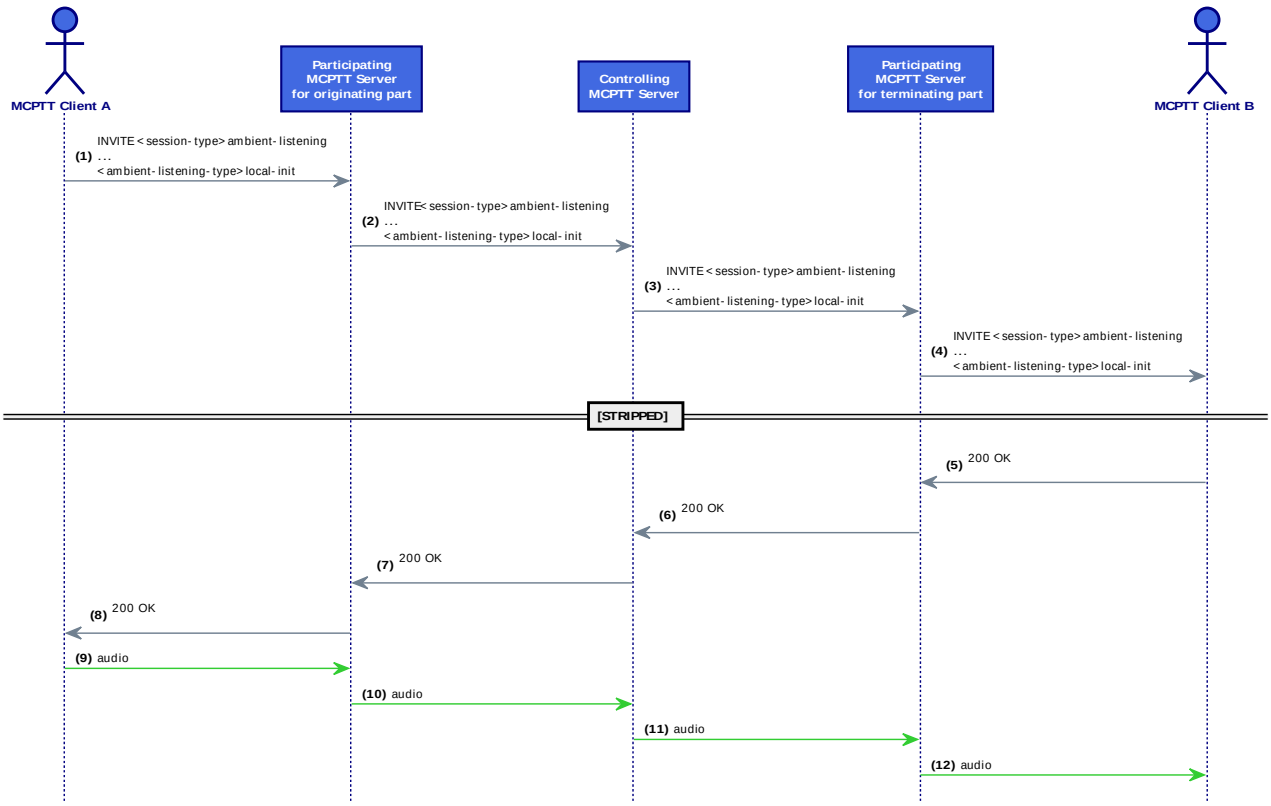

Figure 37: CONN-MCPTT/ONN/AMBIENT/ONDEM/LOCAL/01 Message Sequence

Message Details

Trace Pending

Table 46: CONN-MCPTT/ONN/AMBIENT/ONDEM/LOCAL/01 ITD

Interoperability Test Description			
Identifier	CONN-MCPTT/ONN/AMBIENT/ONDEM/LOCAL/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a locally initiated ambient listening 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 [6] and other references in ETSI TS 124 379 [9]) MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-Rel14, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-Rel14, MCPTT-Part_AFFIL, MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-Rel14, MCPTT-Ctrl_AFFIL (clause 6.8)		
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) initiates locally an ambient listening call towards User 2 (mcptt_id_clientB@example.com)
	2	check	Dialog creating INVITE received at the MCPTT participating server of User1
	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	verify	Call connected and ambient listening activated

7.2.31 MCPTT User releases locally an on-demand ambient listening call [CONN-MCPTT/ONN/AMBIENT/ONDEM/LOCAL/02]

In this test case an authorised MCPTT user releases an ongoing ambient listening call. The associated procedures are described in clause 11.1.6.2.1.3 in [9].

Message Sequence Diagram

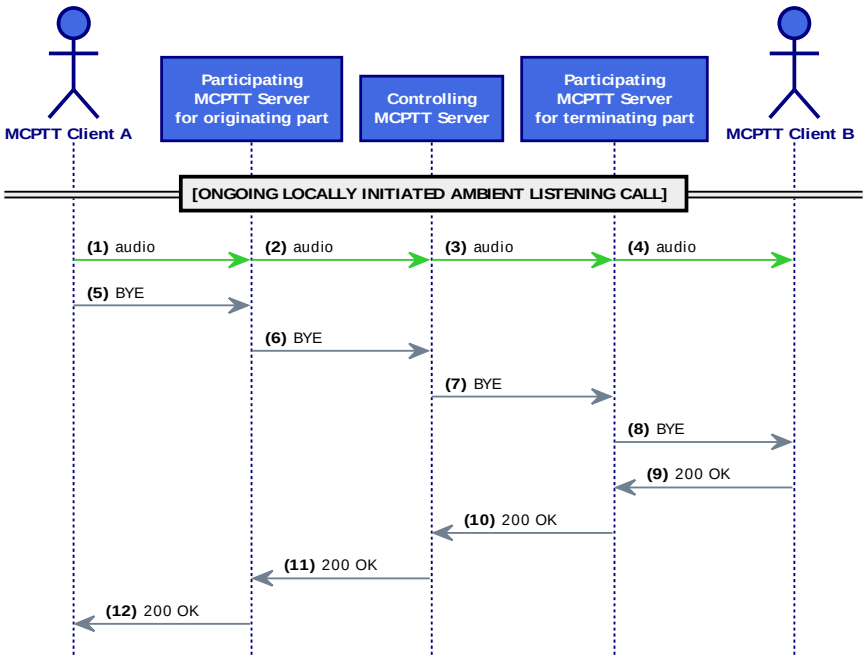

Figure 38: CONN-MCPTT/ONN/AMBIENT/ONDEM/LOCAL/02 Message Sequence

Message Details

Trace Pending

Table 47: CONN-MCPTT/ONN/AMBIENT/ONDEM/LOCAL/02 ITD

Interoperability Test Description	
Identifier	CONN-MCPTT/ONN/AMBIENT/ONDEM/LOCAL/02
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling for the release of a locally initiated ambient listening 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])
Applicability	• MCPTT-Client_ONN-MCPTT-Rel14, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-Rel14, MCPTT-Part_AFFIL MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-Rel14, MCPTT-Ctrl_AFFIL (clause 6.8)
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	check	Ongoing locally initiated ambient listening call
	2	stimulus	User 1 (mcptt_id_clientA@example.com) releases the ambient listening call
	3	check	BYE sent to the MCPTT participating server of User1
	4	check	Upon arrival of the BYE User 2 is notified (listening MCPTT user) and 200 OK generated back
	5	verify	Call disconnected, all cache removed and ambient listening deactivated

7.2.32 MCPTT User setups locally an ambient listening call using pre-established session [CONN-MCPTT/ONN/AMBIENT/PRE/LOCAL/01]

This test shall verify an ambient listening call locally initiated using pre-established session as defined in clause 11.1.6.2.2 in [4].

Similarly to the test in clause 7.2.17 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.
For a locally initiated MCPTT ambient listening call using a pre-established session, an MCPTT client shall generate a SIP REFER request outside a dialog in accordance with the procedures specified in [6], [28] and [25] as updated by [34] and [35].

Message Sequence Diagram

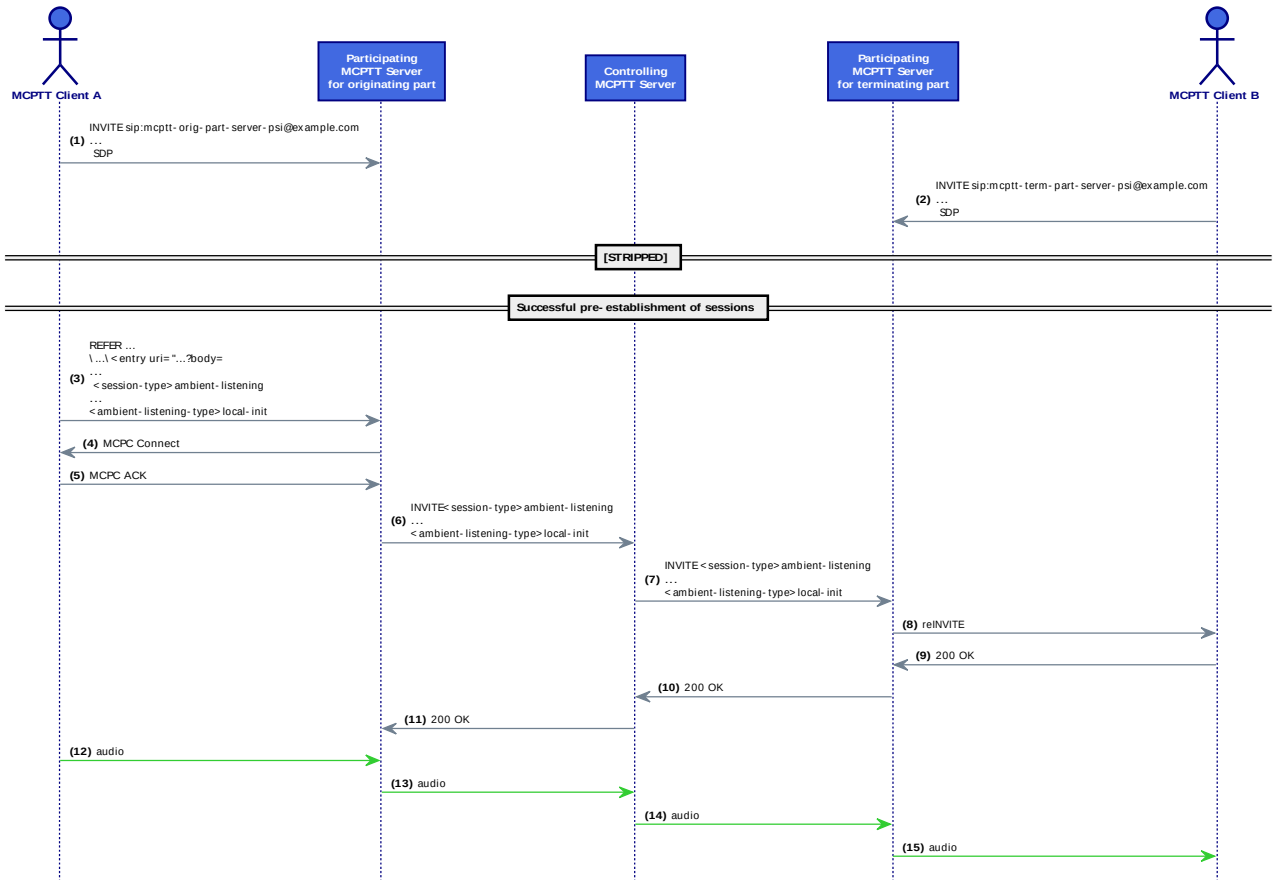

Figure 39: CONN-MCPTT/ONN/AMBIENT/PRE/LOCAL/01 Message Sequence

Message Details

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Trace Pending
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Table 48: CONN-MCPTT/ONN/AMBIENT/PRE/LOCAL/01 ITD

Interoperability Test Description			
Identifier	CONN-MCPTT/ONN/AMBIENT/PRE/LOCAL/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of locally initiated ambient listening call using preestablished 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 6.7) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.8)		
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 and User 2 pre-establish their respective sessions
	2	check	Sessions pre-established
	3	stimulus	User 1 initiates a locally initiated ambient listening calls to User 2 using pre-established session
	4	check	REFER is created with proper <session-type> set to ambient-listening and <ambient-listening-type> to local-init in the body param of the uri and sent to the participating server of User 1
	5	check	The participating server creates the proper INVITE with data embedded in the REFER and forwards it
	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 Connect message
	8	check	Similarly Client User 2 is notified with reINVITE and Call automatically accepted
	9	verify	Call connected and ambient listening call activated

7.2.33 MCPTT User releases locally an ambient listening call using pre-established session [CONN-MCPTT/ONN/AMBIENT/PRE/LOCAL/02]

This test shall verify the release of an ongoing locally initiated ambient listening call using preestablished session as defined in clause 11.1.6.2.2.3 in [9]. Such procedure comprises carrying out the pre-established session release mechanisms using the out-of-dialog REFER as described in clause 6.2.5.2 in [9].

Message Sequence Diagram

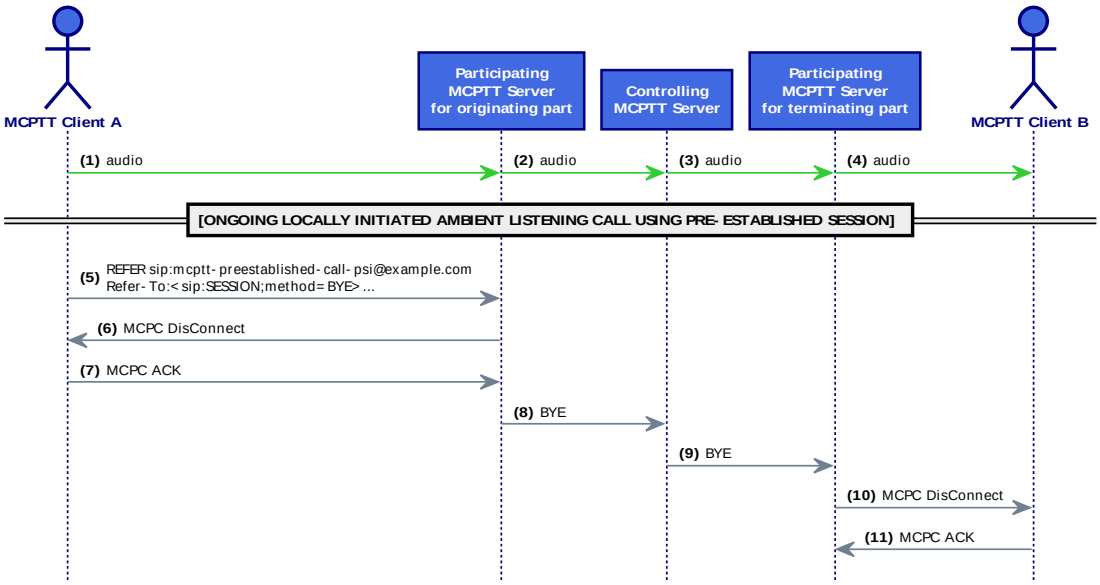

Figure 40: CONN-MCPTT/ONN/AMBIENT/PRE/LOCAL/02 Message Sequence

Message Details

Trace Pending

Table 49: CONN-MCPTT/ONN/AMBIENT/PRE/LOCAL/02 ITD

Interoperability Test Description	
Identifier	CONN-MCPTT/ONN/AMBIENT/PRE/LOCAL/02
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling for the release of a locally initiated ambient listening 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])
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 6.7) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.8)
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	check	On-going locally initiated ambient listening call using pre-established session
	2	stimulus	User 1 releases the locally initiated ambient listening calls to User 2 using pre-established session
	3	check	REFER is created with the BYE properly encoded following pre-established session mechanisms
	4	check	The participating server creates the proper BYE with the data embedded in the REFER and forwards it
	5	check	The controlling server forwards the BYE to the participating server of the callee and sends a 200 back to the participating of the caller
	6	check	The participating of the caller notifies him/her using MCPC (Floor Control) Disconnect message
	7	check	Similarly Client User 2 is notified with MCPC Disconnect
	8	verify	Call disconnected, cache removed and ambient listening deactivated

7.2.34 MCPTT User setups remotely an on-demand ambient listening call [CONN-MCPTT/ONN/AMBIENT/ONDEM/REMOTE/01]

The procedures for ambient listening calls. are applicable to both locally initiated and remotely initiated ambient listening call. In this test case an authorised MCPTT user initiates an ambient listening call in order to listen to the terminating user. The associated procedures are described in clause 11.1.6.2.1.1 in [9]. Being a locally initiated ambient listening call, it shall comply with the conditions for implicit floor control as specified in clause 6.4 in [9]. Participating server will follow procedures in clause 11.1.6.3 in [9], while Controlling clause 11.1.6.4 in [9].

Note the procedure is the same as in clause 7.2.30 but with <ambient-listening-type> element set to a value of remote-init.

Message Sequence Diagram

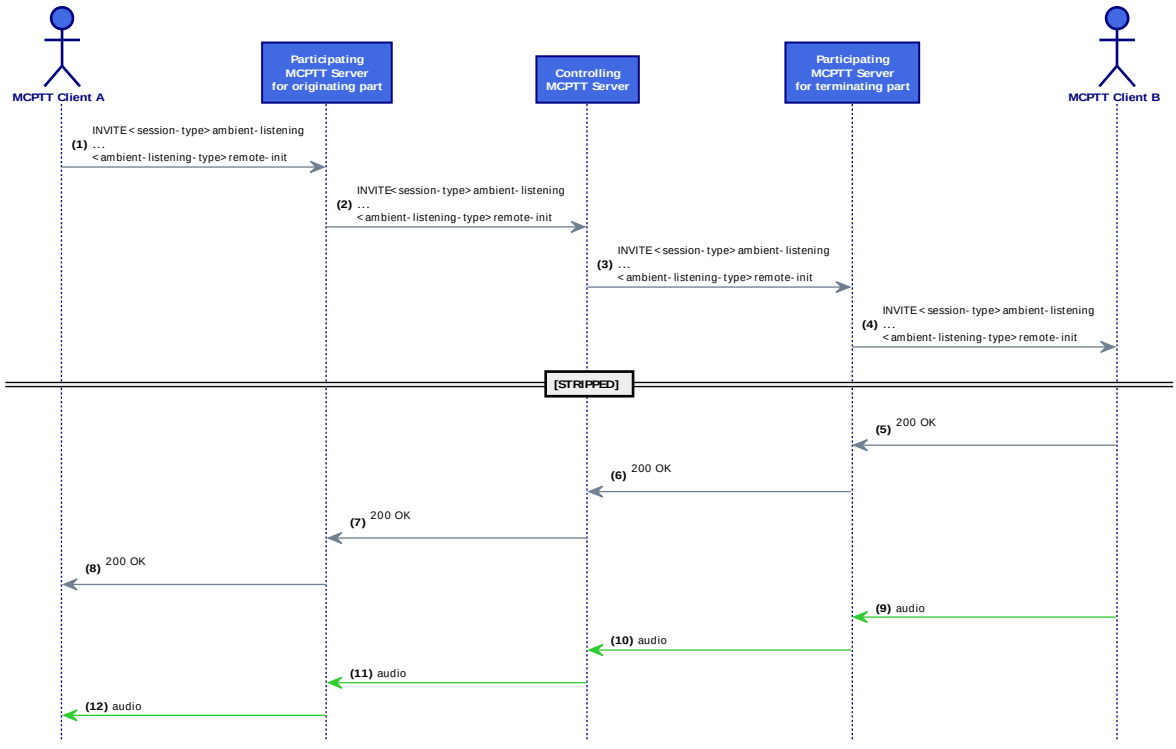

Figure 41: CONN-MCPTT/ONN/AMBIENT/ONDEM/REMOTE/01 Message Sequence

Message Details

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Trace Pending
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Table 50: CONN-MCPTT/ONN/AMBIENT/ONDEM/REMOTE/01 ITD

Interoperability Test Description			
Identifier	CONN-MCPTT/ONN/AMBIENT/ONDEM/REMOTE/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a remotely initiated ambient listening 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-Rel14, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-Rel14, MCPTT-Part_AFFIL , MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-Rel14**,** MCPTT-Ctrl_AFFIL (clause 6.8)		
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) initiates locally an ambient listening call towards 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 NOT notified and the signalling is completed
	6	verify	Call connected and ambient listening activated

7.2.35 MCPTT User releases remotely an on-demand ambient listening call [CONN-MCPTT/ONN/AMBIENT/ONDEM/REMOTE/02]

In this test case an authorised MCPTT user releases an ongoing ambient listening call. The associated procedures are described in clause 11.1.6.2.1.3 in [9].

Message Sequence Diagram

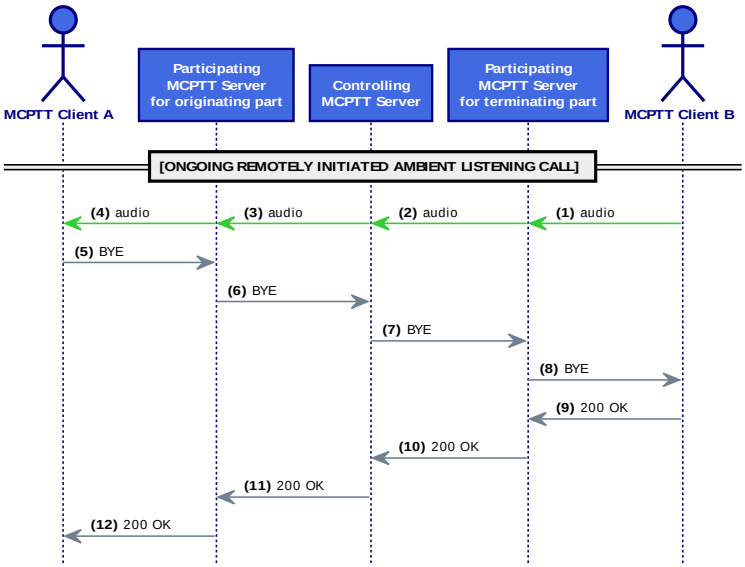

Figure 42: CONN-MCPTT/ONN/AMBIENT/ONDEM/REMOTE/02 Message Sequence

Message Details

Trace Pending

Table 51: CONN-MCPTT/ONN/AMBIENT/ONDEM/REMOTE/02 ITD

Interoperability Test Description			
Identifier	CONN-MCPTT/ONN/AMBIENT/ONDEM/REMOTE/02		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling for the release of a remotely initiated ambient listening 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-Rel14, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-Rel14, MCPTT-Part_AFFIL , MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-Rel14**,** MCPTT-Ctrl_AFFIL (clause 6.8)		
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	check	Ongoing remotely initiated ambient listening call
	2	stimulus	User 1 (mcptt_id_clientA@example.com) releases the ambient listening call
	3	check	BYE sent to the MCPTT participating server of User1
	4	check	Upon arrival of the BYE User 2 is NOT notified (listened-to MCPTT user) and 200 OK generated back
	5	verify	Call disconnected, all cache removed and ambient listening deactivated

7.2.36 MCPTT User setups remotely an ambient listening call using pre-established session [CONN-MCPTT/ONN/AMBIENT/PRE/REMOTE/01]

Equivalent to the test case in clause 7.2.32 but with <ambient-listening-type> set to remote-init.

7.2.37 MCPTT User releases remotely an ambient listening call using pre-established session [CONN-MCPTT/ONN/AMBIENT/PRE/REMOTE/02]

Equivalent to the test case in clause 7.2.33 but with <ambient-listening-type> set to remote-init.

7.2.38 Remote change of selected group[CONN-MCPTT/ONN/GROUPCHANGE/01]

In this test case an authorised MCPTT user sends a group selection change request to change the selected group of a targeted MCPTT user to a specific MCPTT group following the procedures in clause 10.1.4 in [9]. Therefore a SIP MESSAGE is generated, with the <mcpttinfo> element containing the <mcptt-Params> element with the <anyExt> element containing the <mcptt-request-uri> set to the MCPTT group identity to be selected by the targeted MCPTT user and <request-type> element set to a value of "group-selection-change-request". Upon (un)successful affiliation to the requested group the targeted User sends back a SIP MESSAGE with <response-type> element set to a value of "group-selection-change-response" and <selected-group-change-outcome> to success or fail.

Message Sequence Diagram

Figure 43: CONN-MCPTT/ONN/GROUPCHANGE/01 Message Sequence

Message Details

Trace Pending

Table 52: CONN-MCPTT/ONN/GROUPCHANGE/01 ITD

Interoperability Test Description			
Identifier	CONN-MCPTT/ONN/GROUPCHANGE/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling for the request to a targeted user to change affiliated group		
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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-Rel14, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC (clause 6.2) • MCPTT-Part_ONN-MCPTT-Rel14, MCPTT-Part_AFFIL , MCPTT-Part_MCPTT-FC, MCPTT-Part_RX (CFG_ONN_UNI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-Rel14**,** MCPTT-Ctrl_AFFIL (clause 6.8)		
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	Authorised User 1 (mcptt_id_clientA@example.com) sends a request to User 2 ((mcptt_id_clientA@example.com) to change group to mcptt_group2@example.com
	2	check	SIP MESSAGE received at the MCPTT participating server of User1
	3	check	The participating server check rules, maps identities and forwards the message to the controlling server
	4	check	The controlling server forwards the MESSAGE to the participating server of the targeted user
	5	check	The terminating participating server re-maps identities and forward the message to the target
	6	check	Client 2 carries out the affiliation mechanism to the requested group
	7	check	Client 2 sends back the response
	8	verify	MESSAGE received at Client 1 with the result of the request

7.2.39 One-to-one standalone SDS over SIP [CONN-MCDATA/ONN/O2O/STANDALONE/SDS-/SIP/01]

This test case describe the submission of a SDS from a MCData Client to another one using SIP message according to the procedures described in clauses 6.2.1.1, 6.2.2.1, 6.2.4.1, 15.1.2, 15.1.4, 15.2.7 to 15.2.9, 15.2.11 to 15.2.13, 9.2.2.2.2 in the Client side, 6.3.1.1, 9.2.2.3.1, 9.2.2.4.1, 9.2.2.4.2 and 9.2.2.3.2 in different originating participating, controlling and terminating participating servers respectively in ETSI TS 124 282 [8].

NOTE: Forwarding of 200 OK messages still under discussion.

Message Sequence Diagram

Figure 44: CONN-MCDATA/ONN/O2O/STANDALONE/SDS/SIP/01 Message Sequence

Message Details

Trace Pending

Table 53: CONN-MCDATA/ONN/O2O/STANDALONE/SDS/SIP/01 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/ONN/O2O/STANDALONE/SDS/SIP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling to send a SDS o2o standalone message		
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 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCData-Client_ONN-MCData-SDS-SP (clause 6.2) • MCData-Part_ONN-MCData-SDS-SP, MCData-Part_AFFIL (clause 6.7) • MCData-Ctrl_ONN-MCData-SDS-SP, MCData-Ctrl_AFFIL (clause 6.8)		
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. mcdata_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcdata_id_clientA@example.com) sends a multipart SIP message encapsulating a standalone SDS o2o to User 2
	2	check	SIP message arrives at originating participating
	3	check	SIP message forwarded from the originating to the controlling
	4	check	Controlling sends back 202
	5	check	SIP message forwarded from the controlling to the terminating
	6	verify	SDS o2o standalone message properly received and decoded by User 2 mc-data_id_clientB@example.com

7.2.40 One-to-one standalone SDS over media plane (MSRP) [CONN-MCDATA/ONN/O2O/STANDALONE/SDS/MSRP/01]

This test case describes the submission of a standalone o2o SDS from a MCData Client to another one with SIP signalling and MSRP using "SIP INVITE request for standalone SDS over media plane for originating participating MCData function" according to the procedures described in ETSI TS 124 282 [8], clauses 6.3.1.2 and originating participating (clause 9.2.3.3.3), controlling (clause 9.2.3.4) and terminating (clause 9.2.3.3.4) participating servers respectively. Upon successful SIP session establishment the Client sends the SDS message over MSRP using mechanisms defined in clauses 6.1.1, 6.2.1 and 6.3.1 in ETSI TS 124 582 [17]. It is important to remark that, according to clause 5.1 in [17] "Data to be transmitted either by the MCData user media plane shall be transmitted by the MCData client to the participating MCData function. The participating MCData function shall forward the data to the controlling MCData function. The controlling MCData function shall distribute the data to the destination MCData client for one-to-one MCData service and to the MCData clients of the affiliated group members for group MCData service via the participating MCData functions serving each destination MCData client". "In the media plane the MCData client and the controlling MCData function shall act as MSRP clients. If and when a participating MCData function is in the communication path as a separate entity between the controlling MCData function and one or more MCData clients, it shall act as an MSRP relay". Additionally, according to clause 6.2.1.1 in ETSI TS 124 582 [17] "the media plane is established between the originating MCData client and the originating participating MCData function, the originating participating MCData function and the controlling MCData function, the controlling MCData function and the terminating participating MCData function(s) and each terminating participating MCData function and the terminating MCData client(s)". Then, depending on the a=setup attribute been set to "passive" or "active" and relay/client mechanism an empty MSRP send mechanism would be needed to actually activate the session between two MSRP end-points (check IETF RFC 6135 [33]). The diagram in figure 45 illustrates a possible combination.

Message Sequence Diagram

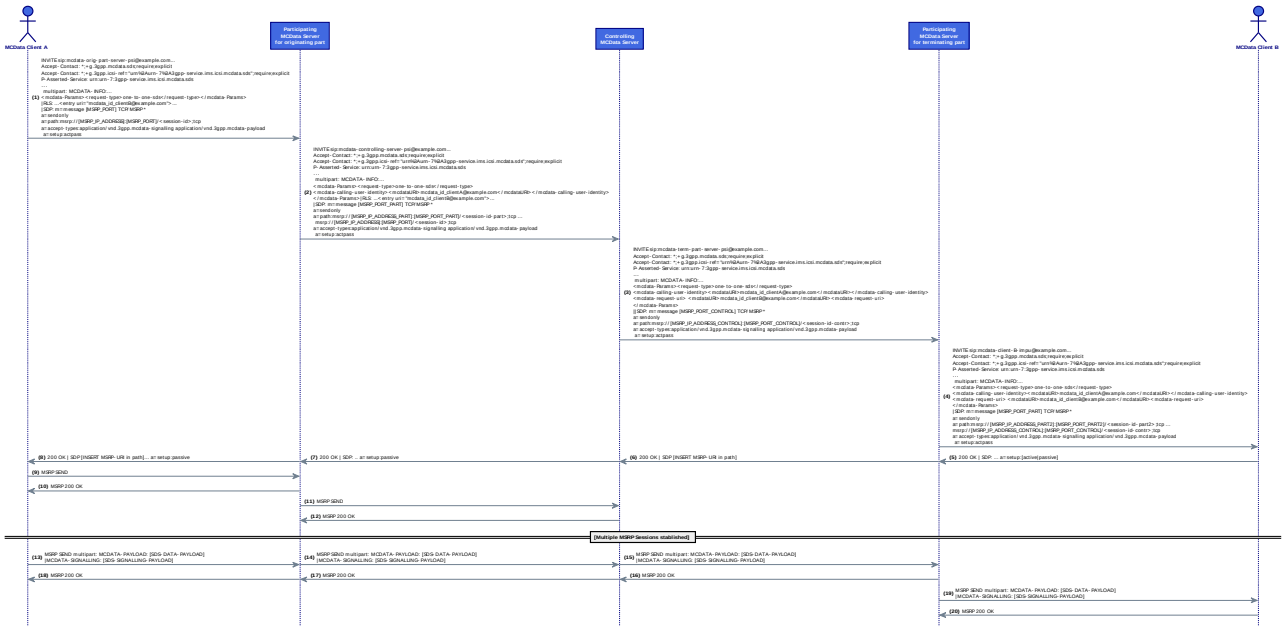

Figure 45: CONN-MCDATA/ONN/O2O/STANDALONE/SDS/MSRP/01 Message Sequence

Message Details

Trace Pending

Table 54: CONN-MCDATA/ONN/O2O/STANDALONE/SDS/MSRP/01 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/ONN/O2O/STANDALONE/SDS/MSRP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling to send a SDS o2o standalone message		
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 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCData-Client_ONN-MCData-SDS-MP (clause 6.2) • MCData-Part_ONN-MCData-SDS-MP, MCData-Part_AFFIL (clause 6.7) • MCData-Ctrl_ONN-MCData-SDS-MP, MCData-Ctrl_AFFIL (clause 6.8)		
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. mcdata_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcdata_id_clientA@example.com) sends an INVITE with MSRP information in the SDP
	2	check	SIP INVITE arrives at originating participating
	3	check	SIP INVITE forwarded from the originating to the controlling
	4	check	SIP INVITE forwarded from the controlling to the terminating and from there to User 2
	5	check	SIP session stablished and associated MSRP information exchanged
	6	verify	SDS o2o standalone message sent to User 2 mcdata_id_clientB@example.com over MSRP

7.2.41 One-to-one SDS session [CONN-MCDATA/ONN/O2O/SESSION/SDS/MSRP/01]

Extension of the standalone case in clause 7.2.40 but using the procedures in clause 9.2.4 in ETSI TS 124 282 [8] (including both Client, participating and controlling servers).

Therefore <request-type> will be set to one-to-one-sds-session and specific timers and refresher mechanisms for the session will be set up. Later both ends of the session will be able to use MSRP to send messages.

Refer to clause 7.2.40 for a detailed description of the flows. Figure 46 shows a simplified version for clarity purposes.

Message Sequence Diagram

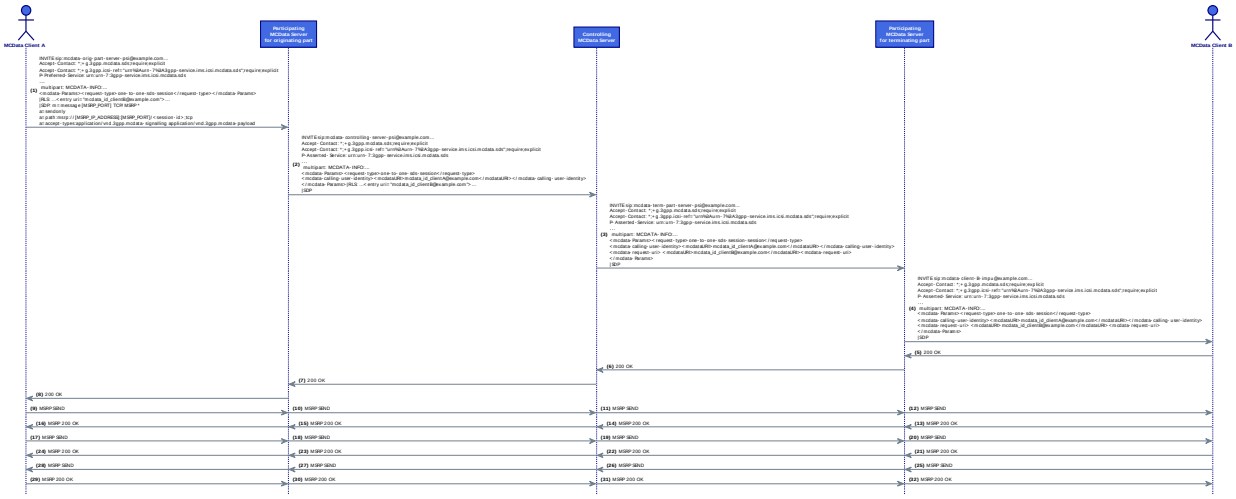

Figure 46: CONN-MCDATA/ONN/O2O/SESSION/SDS/MSRP/01 Message Sequence

Message Details

Trace Pending

Table 55: CONN-MCDATA/ONN/O2O/SESSION/SDS/MSRP/01 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/ONN/O2O/SESSION/SDS/MSRP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling to send a SDS o2o 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 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCData-Client_ONN-MCData-SDS-MP (clause 6.2) • MCData-Part_ONN-MCData-SDS-MP, MCData-Part_AFFIL (clause 6.7) • MCData-Ctrl_ONN-MCData-SDS-MP, MCData-Ctrl_AFFIL (clause 6.8)		
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. mcdata_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcdata_id_clientA@example.com) sends an INVITE with MSRP information in the SDP
	2	check	SIP INVITE arrives at originating participating
	3	check	SIP INVITE forwarded from the originating to the controlling
	4	check	SIP INVITE forwarded from the controlling to the terminating and from there to User 2
	5	check	SIP session stablished and associated MSRP information exchanged
	6	verify	Exchange of SDS messages over the stablished SDS session using MSRP

7.2.42 Group standalone SDS over SIP [CONN-MCDATA/ONN/GROUP/STANDALONE/SDS-/SIP/01]

This test case extends that in clause 7.2.39 but targeting a group rather than a user. Therefore <request-type> will be set to group-sds and, instead of a resource-list document, the <mcdatarequest-uri> element in the mcdata-info will be set to the group identity. Similarly, the procedures are described in ETSI TS 124 282 [8], clauses 6.2.1.1, 6.2.2.1, 6.2.4.1, 15.1.2, 15.1.4, 15.2.7 to 15.2.9, 15.2.11 to 15.2.13, 9.2.2.2.2 in the Client side, 6.3.1.1, 9.2.2.3.1, 9.2.2.4.1, 9.2.2.4.2 and 9.2.2.3.2 in different originating participating, controlling and terminating participating servers respectively. The mechanism is equivalent to that in o2o standalone SDS but, in this case, the controlling will be responsible for forwarding the message to all the group members.

Message Sequence Diagram

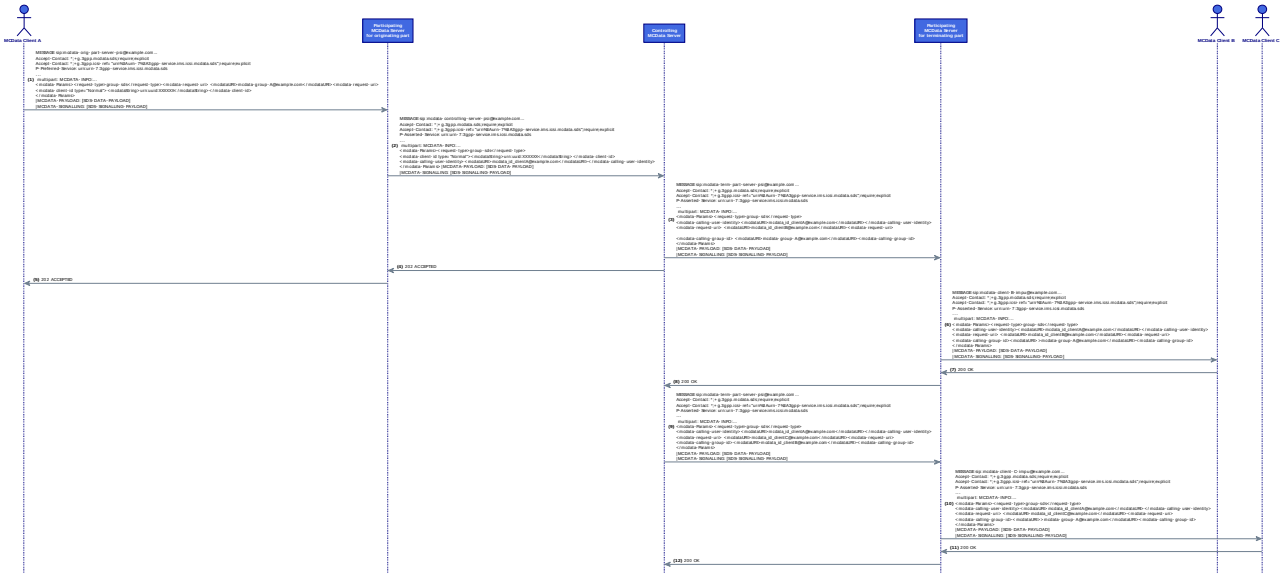

Figure 47: CONN-MCDATA/ONN/GROUP/STANDALONE/SDS/SIP/01 Message Sequence

Message Details

Trace Pending

Table 56: CONN-MCDATA/ONN/GROUP/STANDALONE/SDS/SIP/01 ITD

Interoperability Test Description	
Identifier	CONN-MCDATA/ONN/GROUP/STANDALONE/SDS/SIP/01
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling to send a SDS group standalone message
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 [6] and other references in ETSI TS 124 379 [9])
Applicability	• MCData-Client_ONN-MCData-SDS-SP (clause 6.2) • MCData-Part_ONN-MCData-SDS-SP, MCData-Part_AFFIL (clause 6.7) • MCData-Ctrl_ONN-MCData-SDS-SP, MCData-Ctrl_AFFIL (clause 6.8)
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. mcdata_id

Test Sequence	Step	Type	Description
	1	stimulus	User 1 (mcdata_id_clientA@example.com) sends a multipart SIP message encapsulating a group SDS o2o to User 2
	2	check	SIP message arrives at originating participating
	3	check	SIP message forwarded from the originating to the controlling
	4	check	Controlling sends back 202
	5	check	SIP message forwarded "n" times from the controlling to the terminating responsible for each group member
	6	verify	SDS o2o standalone message properly received and decoded by User 2 mcdata_id_clientB@example.com and User 3 mcdata_id_clientC@example.com

7.2.43 Group standalone SDS over media plane (MSRP) [CONN-MCDATA/ONN/GROUP/STANDALONE/SDS/MSRP/01]

This test case extends that in clause 7.2.40 but targeting a group rather than a user. Therefore <request-type> will be set to group-sds and, instead of a resource-list document, the <mcdatarequest-uri> element in the mcdata-info will be set to the group identity. Therefore the MCData Client sends an SDS over MSRP by setting before a SIP session and exchanging MSRP configuration using "SIP INVITE request for standalone SDS over media plane for originating participating MCData function" according to the procedures described in ETSI TS 124 282 [8], clauses 6.3.1.2 and originating participating (clause 9.2.3.3.3), controlling (clause 9.2.3.4) and terminating (clause 9.2.3.3.4) participating servers respectively. Upon successful SIP session establishment the Client sends the SDS message over MSRP.

Message Sequence Diagram

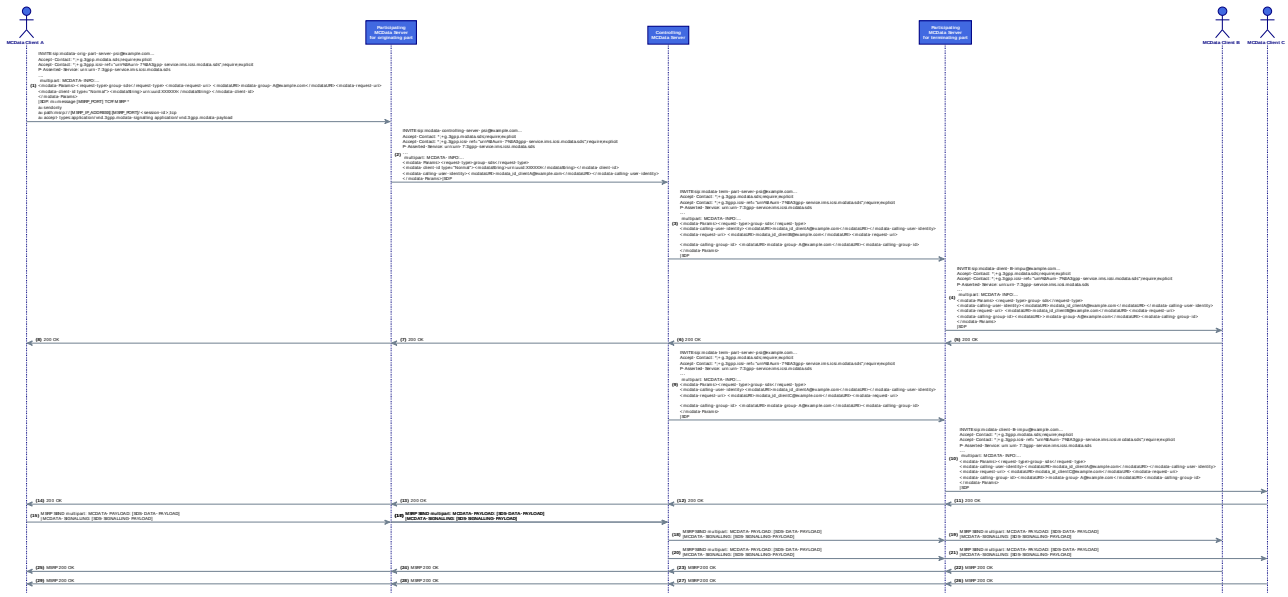

Figure 48: CONN-MCDATA/ONN/GROUP/STANDALONE/SDS/MSRP/01 Message Sequence

Message Details

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Trace Pending
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Table 57: CONN-MCDATA/ONN/GROUP/STANDALONE/SDS/MSRP/01 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/ONN/GROUP/STANDALONE/SDS/MSRP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling to send a SDS group standalone message		
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 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCData-Client_ONN-MCData-SDS-MP (clause 6.2) • MCData-Part_ONN-MCData-SDS-MP, MCData-Part_AFFIL (clause 6.7) • MCData-Ctrl_ONN-MCData-SDS-MP, MCData-Ctrl_AFFIL (clause 6.8)		
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. mcdata_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcdata_id_clientA@example.com) sends an INVITE with MSRP information in the SDP
	2	check	SIP INVITE arrives at originating participating
	3	check	SIP INVITE forwarded from the originating to the controlling
	4	check	SIP INVITE forwarded from the controlling to the terminating and from there to User 2 and User 3
	5	check	SIP session stablished and associated MSRP information exchanged among all ends
	6	verify	SDS group standalone message sent to User 2 and User 3 (mcdata_id_client[B-C]@example.com) over MSRP

7.2.44 Group SDS session [CONN-MCDATA/ONN/GROUP/SESSION/SDS/MSRP/01]

Extension of the standalone case in clause 7.2.43 but using the procedures in clause 9.2.4 in ETSI TS 124 282 [8] (including both Client, participating and controlling servers).

Therefore <request-type> will be set to group-sds-session and specific timers and refresher mechanisms for the session will be set up. Later both ends of the session will be able to use MSRP to send messages using mechanisms in clause 6.3.2 in [17].

Message Sequence Diagram

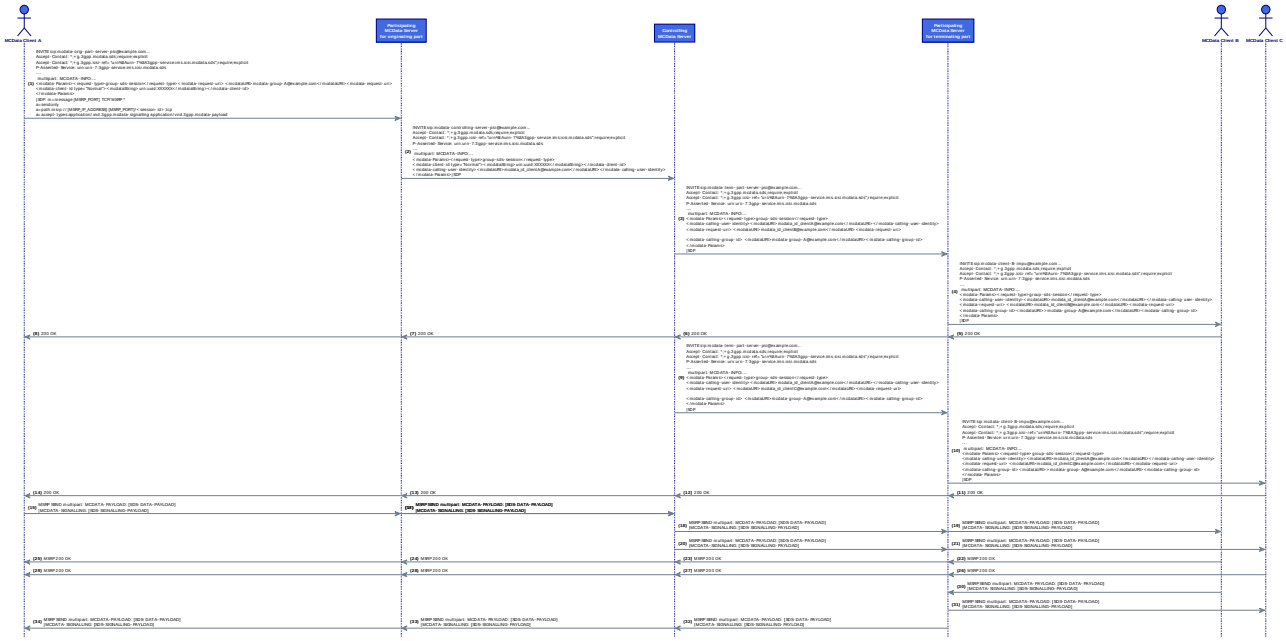

Figure 49: CONN-MCDATA/ONN/GROUP/SESSION/SDS/MSRP/01 Message Sequence

Message Details

`Trace Pending`

Table 58: CONN-MCDATA/ONN/GROUP/SESSION/SDS/MSRP/01 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/ONN/GROUP/SESSION/SDS/MSRP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling to establish a SDS group session using MSRP and exchange messages		
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 [6] and other references in [9])		
Applicability	• MCData-Client_ONN-MCData-SDS-MP (clause 6.2) • MCData-Part_ONN-MCData-SDS-MP, MCData-Part_AFFIL (clause 6.7) • MCData-Ctrl_ONN-MCData-SDS-MP, MCData-Ctrl_AFFIL (clause 6.8)		
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. mcdata_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcdata_id_clientA@example.com) sends an INVITE with MSRP information in the SDP
	2	check	SIP INVITE arrives at originating participating
	3	check	SIP INVITE forwarded from the originating to the controlling
	4	check	SIP INVITE forwarded from the controlling to the terminating and from there to User 2 and User 3
	5	check	SIP session stablished and associated MSRP information exchanged
	6	verify	Exchange of SDS messages over the stablished SDS session using MSRP

7.2.45 One-to-one FD using HTTP [CONN-MCDATA/ONN/O2O/FD/HTTP/01]

This test case deals with the one-to-one file distribution procedure using the HTTP protocol. MCData file distribution functionality is divided into four different steps:

1) The MCData client sender should first learn the absolute URI within the Media Storage Function (MSF) for the file it wants to upload if it does not know it beforehand. SIP MESSAGEs are exchanged between the MCData client and the MSF function in the controlling MCData server to determine this URI (see clause 10.2.1.3 in ETSI TS 124 282 [8]).

2) The MCData client establishes a secure connection with the HTTP proxy and uploads the file with a POST request, which is finally forwarded by the HTTP proxy to the MSF function. This element will store the file until the file availability timer expires (see clause 10.2.2 in ETSI TS 124 282 [8]).

3) The sender MCData client expresses its willingness to transmit the uploaded file to another client in the MCData system. A SIP MESSAGE will be used to inform the other endpoint about the URL of the file, so that it can later download it using HTTP. This MESSAGE includes three parts: a mcdata-info part with the type of request ('one-to-one-fd'), a resource-lists part with the MCData ID of the receiver and a mcdata-signalling part with the URL of the file and some metadata (see clause 10.2.4 in ETSI TS 124 282 [8]).

4) After receiving the SIP MESSAGE, the receiver is able to contact the MSF to download the file using an HTTP GET request. This will also traverse the HTTP proxy (see clause 10.2.3 in ETSI TS 124 282 [8]).

Message Sequence Diagram

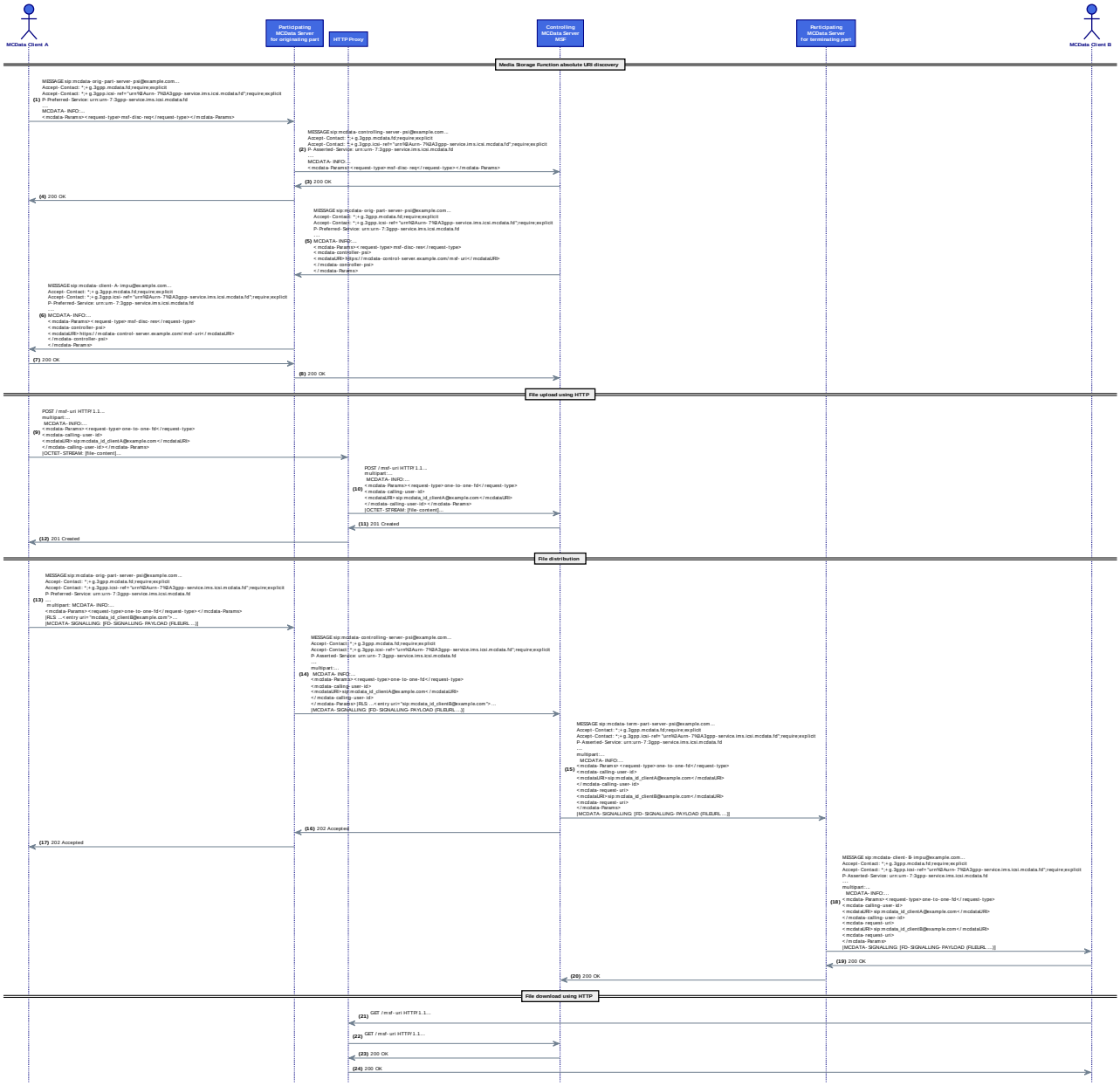

Figure 50: CONN-MCDATA/ONN/O2O/FD/HTTP/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 59: CONN-MCDATA/ONN/O2O/FD/HTTP/01 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/ONN/O2O/FD/HTTP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and HTTP file distribution		
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 [6] and other references in [9]) • HTTP (see IETF RFC 7230 [38]) • TLS (see IETF RFC 5246 [39]) • SSL (see IETF RFC 6101 [40])		
Applicability	• MCData-Client_ONN-MCData-FD-SP (clause 6.2) • MCData-Part_ONN-MCData-FD-SP (clause 6.9) • MCData-Ctrl_ONN-MCData-FD-SP (clause 6.10)		
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. mcdata_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcdata_id_clientA@example.com) wants to send a file to User 2 (mc-data_id_clientB@example.com)
	2	check	MCData client tries to discover the absolute URI for the file
	3	check	MESSAGE received at the orig. MCData part. server
	4	check	The part. server adapts the mcdata-info accordingly and creates a MESSAGE to the controlling server
	5	check	MESSAGE received at the MCData controlling server
	6	check	The MSF function within the MCData controlling server creates the URL for the file and responds with another MESSAGE
	7	check	MESSAGE received at the orig. MCData part. server
	8	check	MESSAGE received at the first MCData client
	9	check	MCData client establishes a secure connection with HTTP proxy and uploads the file using HTTP POST
	10	check	HTTP proxy forwards the file to the MSF
	11	check	MCData client sends an invitation for downloading the file to the other user with a SIP MESSAGE
	12	check	MESSAGE received at the orig. MCData part. server
	13	check	The participating server adapts the mcdata-info accordingly and creates a MESSAGE to the controlling
	14	check	MESSAGE received at the MCData controlling server
	15	check	The controlling server checks permissions and forwards the MESSAGE to the part. server of the callee
	16	check	Upon arrival of the MESSAGE adapted by the term. part. function to the terminating Client User 2 is notified
	17	stimulus	User 2 wants to download the file
	18	check	MCData client establishes a secure connection with the HTTP proxy and downloads the file using HTTP GET

7.2.46 Group FD using HTTP [CONN-MCDATA/ONN/GROUP/FD/HTTP/01]

This test case is similar to the one described in clause 7.2.45, but for file distribution to the members of a group. The file URL will be sent to all affiliated members and each one will be responsible for downloading the file from the MSF function. Group file distribution is described in clause 10.2.4 in ETSI TS 124 282 [8].

Message Sequence Diagram

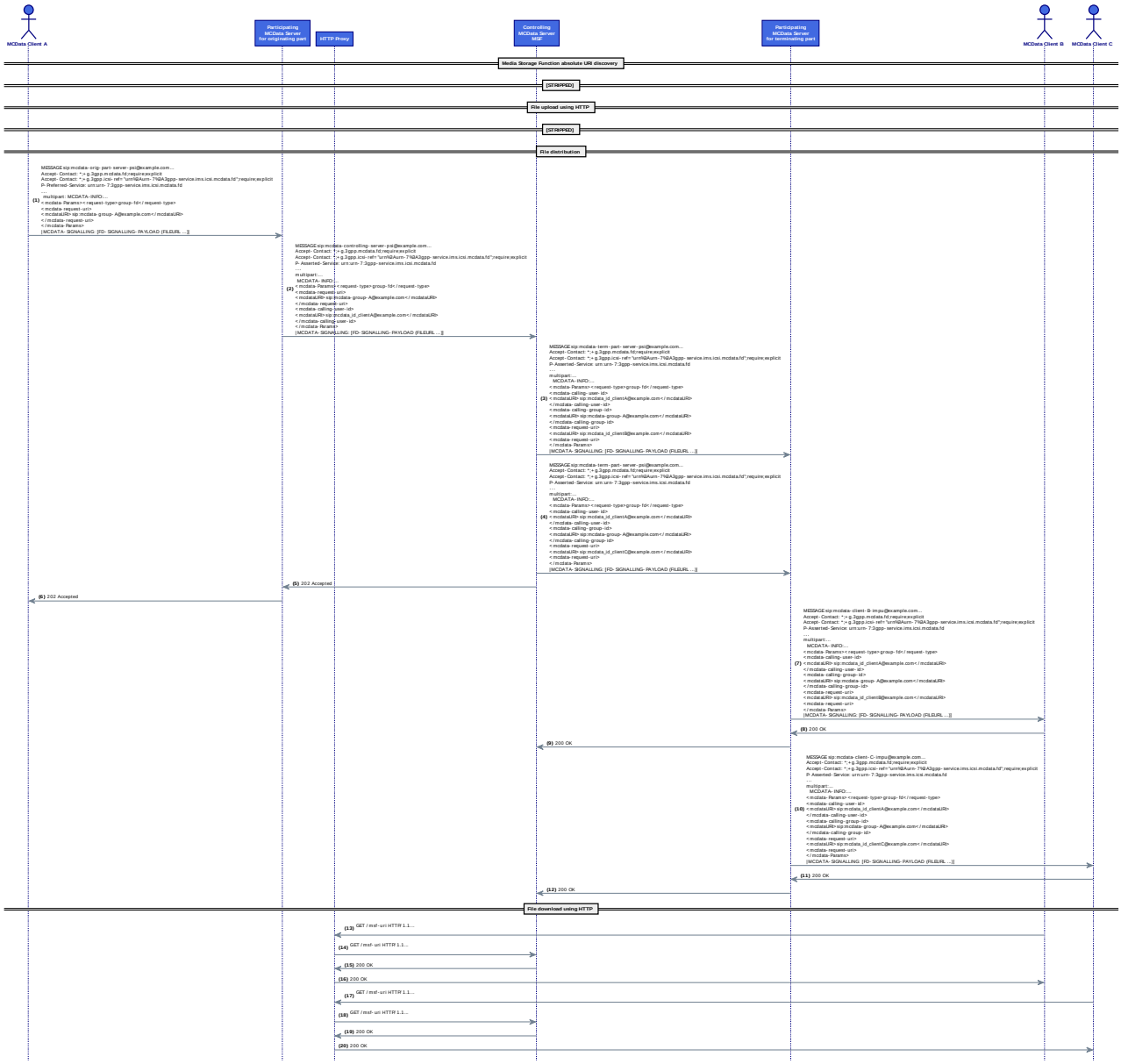

Figure 51: CONN-MCDATA/ONN/GROUP/FD/HTTP/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 60: CONN-MCDATA/ONN/GROUP/FD/HTTP/01 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/ONN/GROUP/FD/HTTP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and HTTP file distribution		
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 [6] and other references in [9]) • HTTP (see IETF RFC 7230 [38]) • TLS (see IETF RFC 5246 [39]) • SSL (see IETF RFC 6101 [40])		
Applicability	• MCData-Client_ONN-MCData-FD-SP (clause 6.2) • MCData-Part_ONN-MCData-FD-SP, MCData-Part_AFFIL (clause 6.9) • MCData-Ctrl_ONN-MCData-FD-SP, MCData-Ctrl_GMS (clause 6.10)		
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. mcdata_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcdata_id_clientA@example.com) wants to send a file to mcdata-group-A@example.com
	2	check	MCData client tries to discover the absolute URI for the file
	3	check	MESSAGE received at the orig. MCData part. server
	4	check	The participating server adapts the mcdata-info accordingly and creates a MESSAGE to the controlling server
	5	check	MESSAGE received at the MCData controlling server
	6	check	The MSF function within the MCData controlling server creates the URL for the file and responds with another MESSAGE
	7	check	MESSAGE received at the originating MCData participating server
	8	check	MESSAGE received at the first MCData client
	9	check	MCData client establishes a secure connection with the HTTP proxy and uploads the file with an HTTP POST
	10	check	HTTP proxy forwards the file to the MSF
	11	check	MCData client sends an invitation for downloading the file to the group with a SIP MESSAGE
	12	check	MESSAGE received at the originating MCData participating server
	13	check	The participating server adapts the mcdata-info accordingly and creates a MESSAGE to the controlling server
	14	check	MESSAGE received at the MCData controlling server
	15	check	The controlling server checks permissions, gathers group affiliated members and sends MESSAGEs to the participating servers of all the callees
	16	check	Upon arrival of the MESSAGEs adapted by the terminating participating function to the terminating clients users are notified
	17	stimulus	Member X wants to download the file
	18	check	MCData client X establishes a secure connection with the HTTP proxy and downloads the file with an HTTP GET

7.2.47 One-to-one FD using media plane (MSRP) [CONN-MCDATA/ONN/O2O/FD/MSRP/01]

There is another alternative for distributing files in MCData: using the media plane and the MSRP protocol. In this case, MCData clients will act as MSRP endpoints, as well as MCData controlling servers. Participating servers will have the role of MSRP relay servers. In order to establish a MSRP connection between two users, they will first need to learn the port and connection characteristics. This signalling is also transported in SDP bodies of SIP INVITE requests. There is more information about this feature in clause 10.2.5 in ETSI TS 124 282 [8].

Message Sequence Diagram

Figure 52: CONN-MCDATA/ONN/O2O/FD/MSRP/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 61: CONN-MCDATA/ONN/O2O/FD/MSRP/01 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/ONN/O2O/FD/MSRP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and file transfer using MSRP		
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 [6] and other references in ETSI TS 124 379 [9]) • MSRP (see IETF RFC 4975 [41] and IETF RFC 6135 [33])		
Applicability	• MCData-Client_ONN-MCData-FD-MP (clause 6.2) • MCData-Part_ONN-MCData-FD-MP (clause 6.9) • MCData-Ctrl_ONN-MCData-FD-MP (clause 6.10)		
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. mcdata_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcdata_id_clientA@example.com) wants to send a file to User 2 (mc-data_id_clientB@example.com)
	2	check	Dialog creating INVITE received at the MCData participating server of User1
	3	check	The participating server adapts the mcdata-info accordingly and creates an INVITE to the controlling server
	4	check	The controlling server checks permissions and forwards 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 file transfer and all the signalling is completed
	7	verify	Call connected and media flows (MSRP) exchanged

7.2.48 Group FD using media plane (MSRP) [CONN-MCDATA/ONN/GROUP/FD/MSRP/01]

This test case is similar to the one described in clause 7.2.47, but for file distribution to the members of a group. File transfer invitations will be sent to all affiliated members and the file distribution will be carried out using the MSRP protocol. Group file distribution using the media plane is described in clause 10.2.5 in ETSI TS 124 282 [8].

Message Sequence Diagram

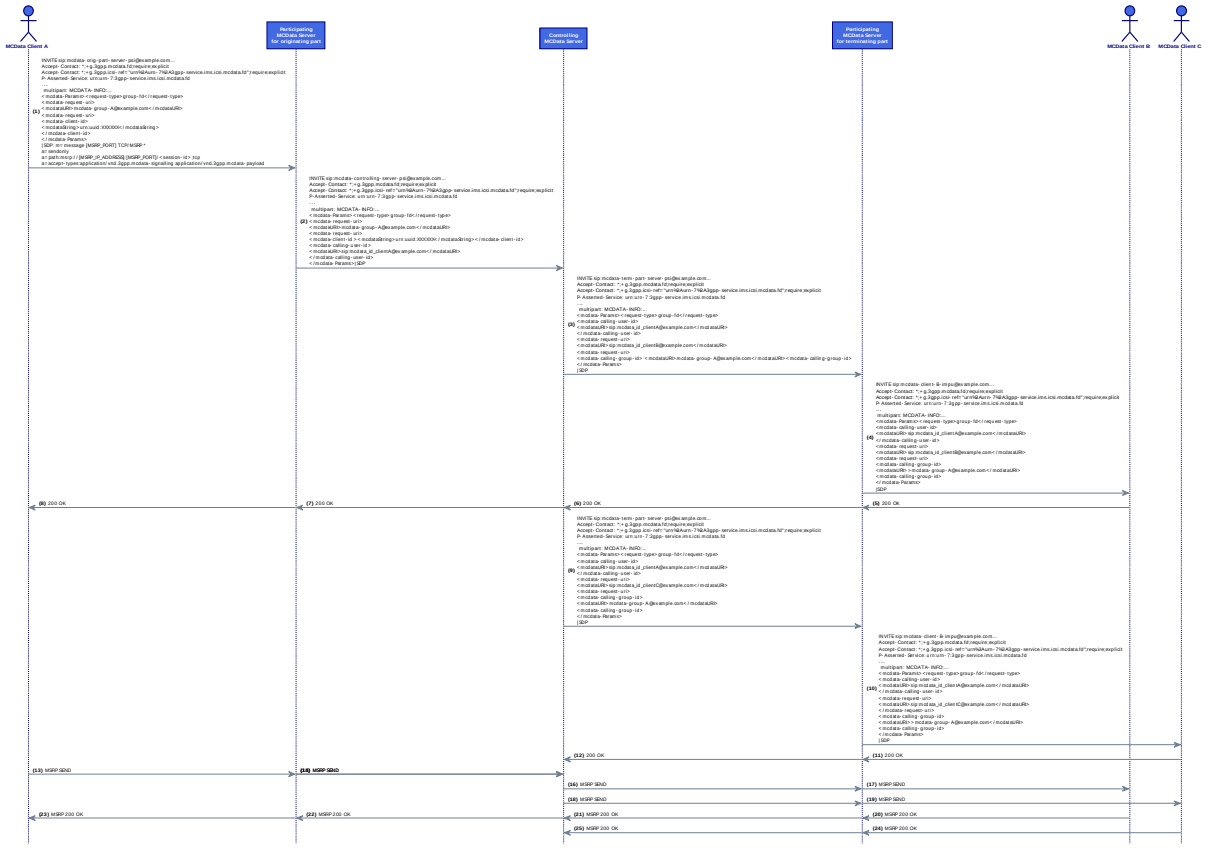

Figure 53: CONN-MCDATA/ONN/GROUP/FD/MSRP/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 62: CONN-MCDATA/ONN/GROUP/FD/MSRP/01 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/ONN/GROUP/FD/MSRP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and file transfer using MSRP		
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 [6] and other references in ETSI TS 124 379 [9]) • MSRP (see IETF RFC 4975 [41] and IETF RFC 6135 [33])		
Applicability	• MCData-Client_ONN-MCData-FD-MP (clause 6.2) • MCData-Part_ONN-MCData-FD-MP, MCData-Part_AFFIL (clause 6.9) • MCData-Ctrl_ONN-MCData-FD-MP, MCData-Ctrl_GMS (clause 6.10)		
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. mcdata_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcdata_id_clientA@example.com) wants to send a file to mcdata-group-A@example.com
	2	check	Dialog creating INVITE received at the MCData participating server of User1
	3	check	The participating server adapts the mcdata-info accordingly and creates an INVITE to the controlling server
	4	check	The controlling server checks permissions, gathers group affiliated members and sends INVITEs to the participating servers of all the callees
	5	check	Upon arrival of the INVITEs adapted by the terminating participating functions to the terminating clients are notified
	6	check	User X accepts the file transfer and all the signalling is completed
	7	verify	Call connected and media flows (MSRP) exchanged

7.2.49 Standalone SDS with delivered and read notification [CONN-MCDATA/ONN/DISNOT/SDS/01]

The following test case tries to demonstrate the use of disposition notifications in SDS transmissions. It specifically shows the use of delivered and read notifications, in which the sender explicitly requests to be informed when the other end receives and reads the SDS. This is done by setting the correct value in the 'SDS disposition request type' field of the SDS signalling in SIP MESSAGE requests. This test case only focuses on SDS transmissions over SIP signalling as explained in clause 7.2.39. For SDS transmissions over media plane, please refer to clause 7.2.40 in this same document. Disposition notifications are based on SIP MESSAGEs sent back to the sender of SDSs with the request-type tag of mcdata-info bodies set to 'notify' values. 'Delivered and read' values will be set in 'SDS disposition notification type' fields of SDS notification messages included in mcdatasignalling parts of MESSAGE bodies. More information about these procedures can be found in clause 12.2 in ETSI TS 124 282 [8]. This clause just shows the use of disposition notifications in one-to-one standalone SDS transmissions.

Message Sequence Diagram

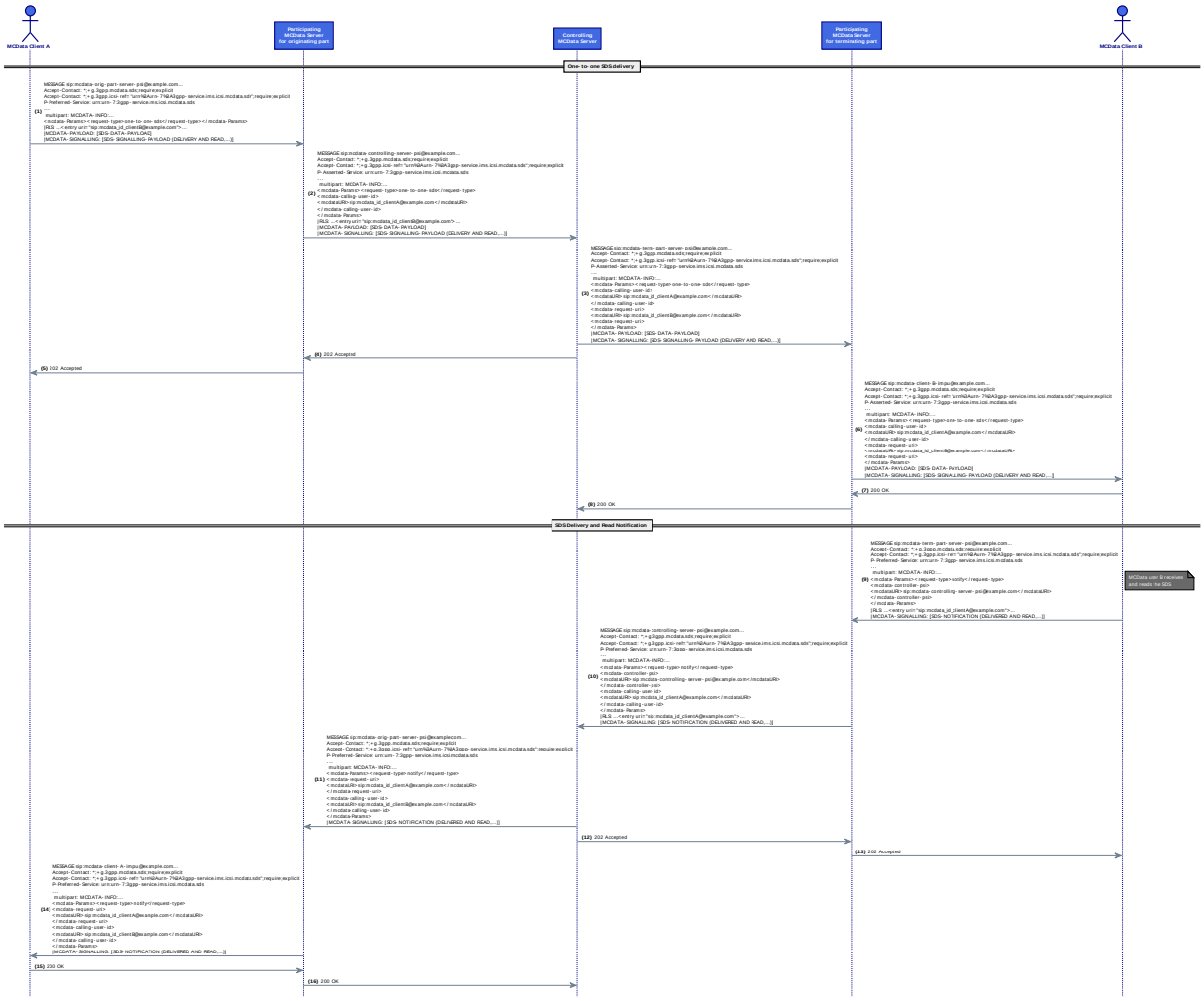

Figure 54: CONN-MCDATA/ONN/DISNOT/SDS/01 Message Sequence

Message Details

`Trace Pending`

Interoperability Test Description

Table 63: CONN-MCDATA/ONN/DISNOT/SDS/01 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/ONN/DISNOT/SDS/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling to send a SDS o2o standalone message and SDS notification		
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 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCData-Client_ONN-MCData-SDS-SP (clause 6.2) • MCData-Part_ONN-MCData-SDS-SP, MCData-Part_AFFIL (clause 6.7) • MCData-Ctrl_ONN-MCData-SDS-SP, MCData-Ctrl_AFFIL (clause 6.8)		
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. mcdata_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcdata_id_clientA@example.com) sends a multipart SIP message encapsulating a standalone SDS o2o to User 2
	2	check	SIP message arrives at originating participating
	3	check	SIP message forwarded from the originating to the controlling
	4	check	Controlling sends back 202
	5	check	SIP message forwarded from the controlling to the terminating
	6	verify	SDS o2o standalone message properly received and decoded by User 2 mc-data_id_clientB@example.com
	7	check	MCData client B sends a disposition notification indicating 'delivered and read' within a SIP message
	8	check	SIP message arrives at terminating participating
	9	check	SIP message forwarded from the terminating to the controlling
	10	check	Controlling sends back 202
	11	check	SIP message forwarded from the controlling to the terminating
	12	verify	SDS disposition notification is correctly decoded in the caller

7.2.50 Group standalone SDS with delivered and read notification [CONN-MCDATA/ONN/DISNOT/SDS/02]

This is a similar test case to the one described in clause 7.2.49 but for the group SDS case. Every receiving partner will send back its notification to the sender when the MCData client receives and the user reads the message.

Message Sequence Diagram

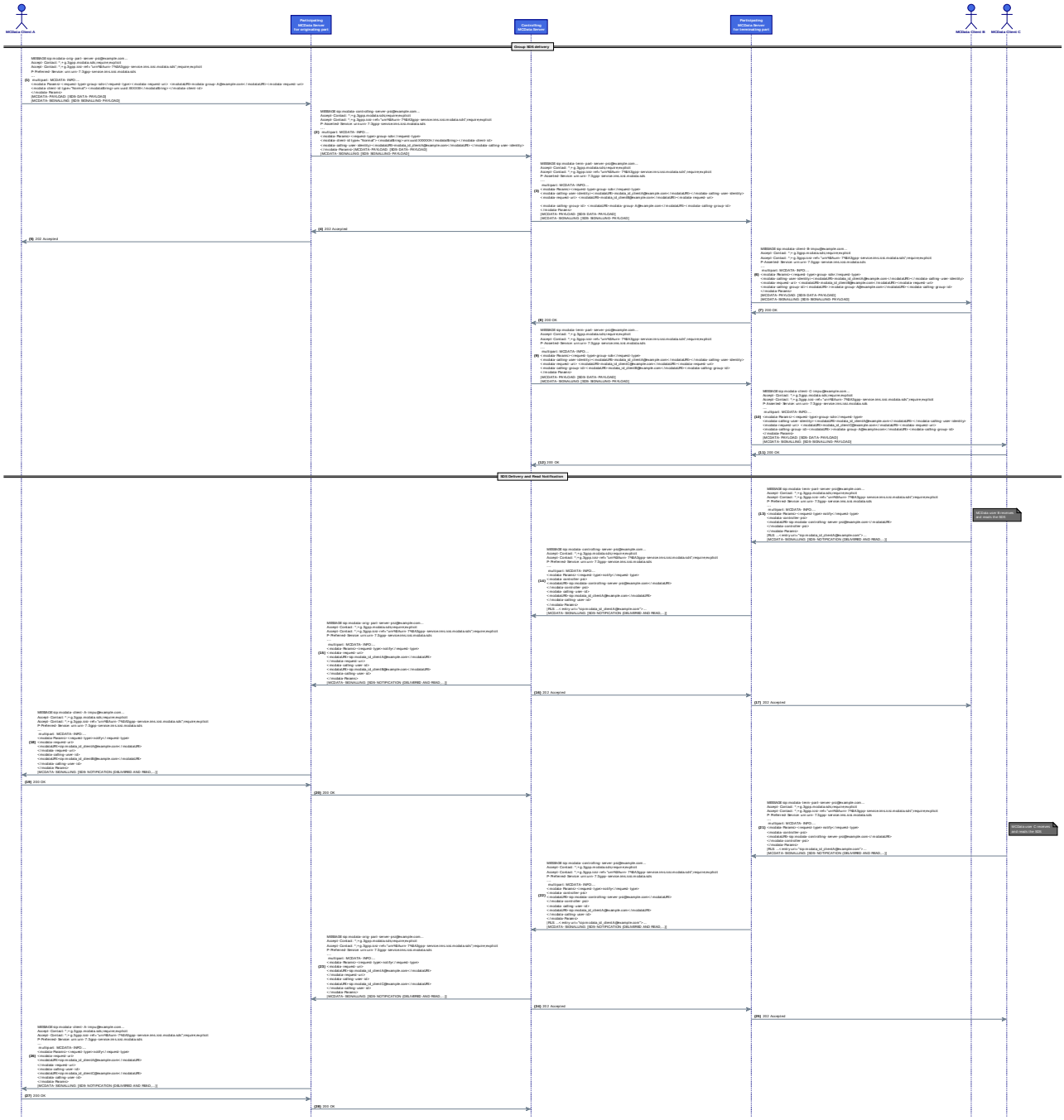

Figure 55: CONN-MCDATA/ONN/DISNOT/SDS/02 Message Sequence

Message Details

`Trace Pending`

Interoperability Test Description

Table 64: CONN-MCDATA/ONN/DISNOT/SDS/02 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/ONN/DISNOT/SDS/02		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling to send a group SDS standalone message and SDS notification		
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 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCData-Client_ONN-MCData-SDS-SP (clause 6.2) • MCData-Part_ONN-MCData-SDS-SP, MCData-Part_AFFIL (clause 6.7) • MCData-Ctrl_ONN-MCData-SDS-SP, MCData-Ctrl_AFFIL (clause 6.8)		
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. mcdata_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcdata_id_clientA@example.com) sends a multipart SIP message encapsulating a standalone group SDS to
	2	check	SIP message arrives at originating participating
	3	check	SIP message forwarded from the originating to the controlling
	4	check	Controlling sends back 202
	5	check	SIP message forwarded from the controlling to the terminating
	6	verify	SDS o2o standalone message properly received and decoded by User 2 mc-data_id_clientB@example.com
	7	check	MCData client B sends a disposition notification indicating 'delivered and read' within a SIP message
	8	check	SIP message arrives at terminating participating
	9	check	SIP message forwarded from the terminating to the controlling
	10	check	Controlling sends back 202
	11	check	SIP message forwarded from the controlling to the terminating
	12	verify	SDS disposition notification is correctly decoded in the caller

7.2.51 One-to-one FD using HTTP with file download completed notification [CONN-MCDATA/ONN/DISNOT/FD/01]

The use of disposition notifications for MCData FD will be tested here. In this case the sender requests the transmission of a notification in the FD SIGNALLING body of the SIP MESSAGE used for the file distribution, so that the sender gets informed when the receiver has completed the file download. The HTTP based file transmission will be only considered in this test case; an analogous procedure to the one described in clause 7.2.45.

Disposition notifications are based on SIP MESSAGEs sent back to the client who has uploaded the file. The request-type tag of mcdata-info bodies in these messages will be set to 'notify' values. 'File download completed' values will be set in 'FD disposition notification type' fields of FD notification messages included in mcdata-signalling parts of MESSAGE bodies. More information about these procedures can be found in clause 12.2 in ETSI TS 124 282 [8]).

This clause just shows the use of disposition notifications in one-to-one file distributions.

Message Sequence Diagram

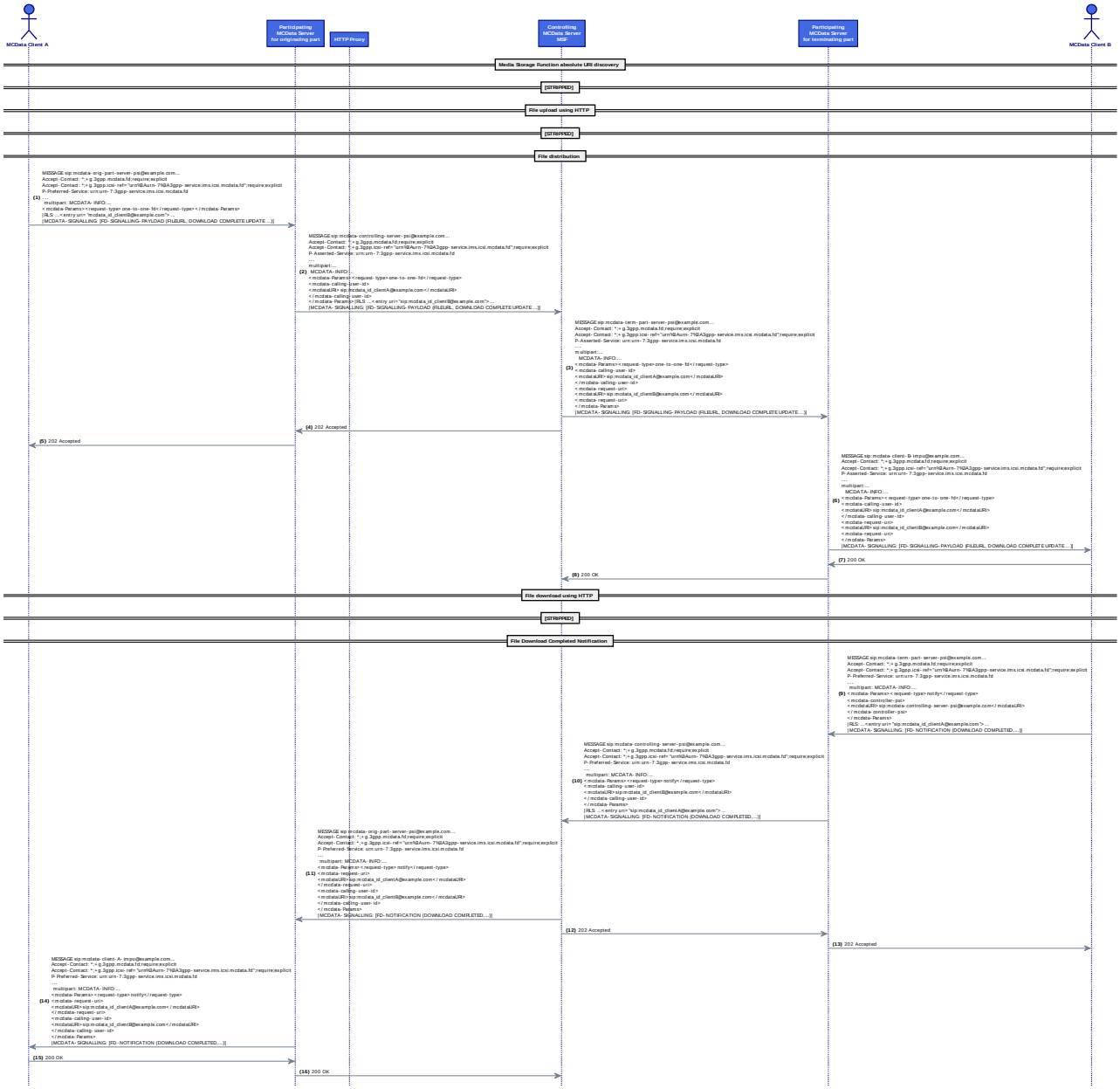

Figure 56: CONN-MCDATA/ONN/DISNOT/FD/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 65: CONN-MCDATA/ONN/DISNOT/FD/01 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/ONN/DISNOT/FD/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling, HTTP based FD and FD disposition notification		
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 [6] and other references in ETSI TS 124 379 [9]) • HTTP (see IETF RFC 7230 [38]) • TLS (see IETF RFC 5246 [39]) • SSL (see IETF RFC 6101 [40])		
Applicability	• MCData-Client_ONN-MCData-FD-SP (clause 6.2) • MCData-Part_ONN-MCData-FD-SP (clause 6.9) • MCData-Ctrl_ONN-MCData-FD-SP (clause 6.10)		
•			
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	User 1 (mcdata_id_clientA@example.com) wants to send a file to User 2 (mc-data_id_clientB@example.com)
	2	check	MCData client tries to discover the absolute URI for the file
	3	check	MESSAGE received at the originating MCData part. server
	4	check	The part. server adapts the mcdata-info accordingly and creates a MESSAGE to the controlling server
	5	check	MESSAGE received at the MCData controlling server
	6	check	The MSF function within the MCData controlling server creates the URL for the file and responds with another MESSAGE
	7	check	MESSAGE received at the originating MCData part. server
	8	check	MESSAGE received at the first MCData client
	9	check	MCData client establishes a secure connection with the HTTP proxy and uploads the file with an HTTP POST
	10	check	HTTP proxy forwards the file to the MSF
	11	check	MCData client sends an invitation for downloading the file to the other user with a SIP MESSAGE
	12	check	MESSAGE received at the originating MCData part. server
	13	check	The part. server adapts the mcdata-info accordingly and creates a MESSAGE to the controlling server
	14	check	MESSAGE received at the MCData controlling server
	15	check	The controlling server checks permissions and forwards the MESSAGE to the part. server of the callee
	16	check	Upon arrival of the MESSAGE adapted by the terminating part. function to the terminating Client User 2 is notified
	17	stimulus	User 2 wants to download the file
	18	check	MCData client B establishes a secure connection with the HTTP proxy and downloads the file with an HTTP GET
	19	check	MCData client B sends a disposition notification indicating 'file download completed' within a SIP MESSAGE
	20	check	SIP MESSAGE arrives at terminating part.
	21	check	SIP MESSAGE forwarded from the terminating to the controlling
	22	check	controlling sends back 202
	23	check	SIP MESSAGE forwarded from the controlling to the originating
	24	verify	FD disposition notification is correctly decoded in the sender

7.2.52 Group FD using HTTP with file download completed notification [CONN-MCDATA/DISNOT/FD/02]

This is an analogous test case to the one included in clause 7.2.51 but for the group FD case. Every partner which downloads the file will send back a file download completed notification to the sender when the download process finishes. More details about how to distribute files to groups can be found in clause 10.2 in ETSI TS 124 282 [8]. The procedure to send notifications is explained in ETSI TS 124 282 [8], clause 12.2.

Message Sequence Diagram

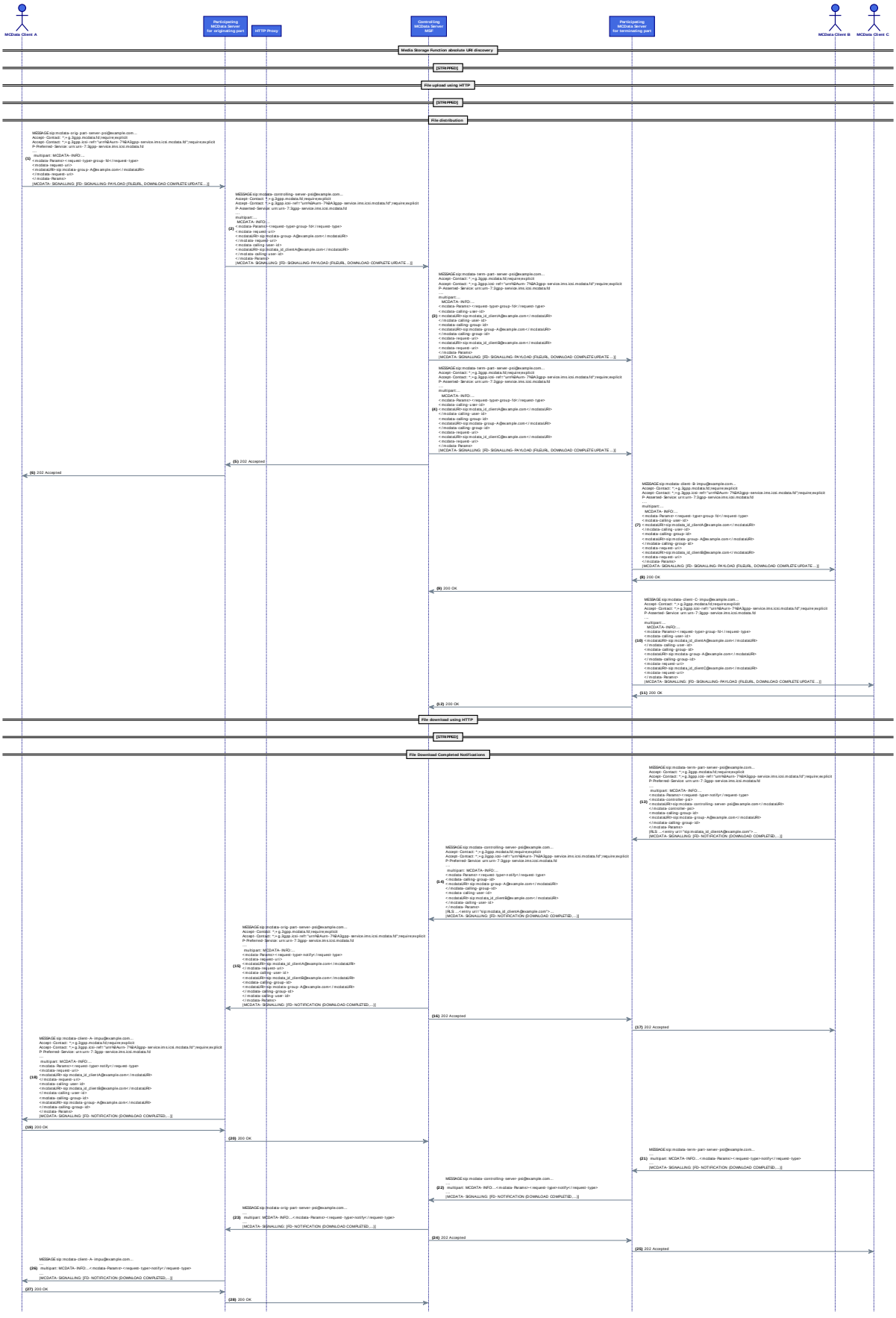

Figure 57: CONN-MCDATA/DISNOT/FD/02 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 66: CONN-MCDATA/DISNOT/FD/02 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/DISNOT/FD/02		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling, HTTP based FD and FD disposition notification		
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 [6] and other references in ETSI TS 124 379 [9]) • HTTP (see IETF RFC 7230 [38]) • TLS (see IETF RFC 5246 [39]) • SSL (see IETF RFC 6101 [40])		
Applicability	• MCData-Client_ONN-MCData-FD-SP (clause 6.2) • MCData-Part_ONN-MCData-FD-SP, MCData-Part_AFFIL (clause 6.9) • MCData-Ctrl_ONN-MCData-FD-SP, MCData-Ctrl_GMS (clause 6.10)		
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 ctrl. and part. servers • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcdata_id		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcdata_id_clientA@example.com) wants to send a file to mcdata-group-A@example.com
	2	check	MCData client tries to discover the absolute URI for the file
	3	check	MESSAGE received at the originating MCData part.server
	4	check	The part. server adapts the mcdata-info accordingly and creates a MESSAGE to the ctrl. server
	5	check	MESSAGE received at the MCData ctrl. server
	6	check	The MSF function within the MCData ctrl. server creates the URL for the file and responds with another MESSAGE
	7	check	MESSAGE received at the originating MCData part.server
	8	check	MESSAGE received at the first MCData client
	9	check	MCData client establishes a secure connection with the HTTP proxy and uploads the file with an HTTP POST
	10	check	HTTP proxy forwards the file to the MSF
	11	check	MCData client sends an invitation for downloading the file to the group with a SIP MESSAGE
	12	check	MESSAGE received at the originating MCData part.server
	13	check	The part. server adapts the mcdata-info accordingly and creates a MESSAGE to the ctrl. server
	14	check	MESSAGE received at the MCData ctrl. server
	15	check	The ctrl. server checks permissions, gathers group affiliated members and sends MESSAGEs to the part. servers of all the callees
	16	check	Upon arrival of the MESSAGEs adapted by the terminating part. function to the terminating clients users are notified
	17	stimulus	Member X wants to download the file
	18	check	MCData client X establishes a secure connection with the HTTP proxy and downloads the file with an HTTP GET
	19	check	MCData client X sends a disposition notification indicating 'file download completed' within a SIP MESSAGE
	20	check	SIP MESSAGE arrives at terminating part.
	21	check	SIP MESSAGE forwarded from the terminating to the ctrl.
	22	check	ctrl. sends back 202
	23	check	SIP MESSAGE forwarded from the ctrl. to the originating
	24	verify	FD disposition notification is correctly decoded in the sender

7.2.53 Network triggered FD notifications [CONN-MCDATA/NET/FD/01]

When a user uploads a file to be distributed using HTTP protocol as described in clauses 7.2.45 or 7.2.46, the MCData client will set a file-availability timer as part of the file metadata in the FD signalling part of the SIP MESSAGE. When this timer expires the controlling MCData server is responsible for notifying the users who have not downloaded the file that they will no longer be able to download the file. This is an example of a network triggered FD notification as explained in ETSI TS 124 282 [8], clause 12.4.

Message Sequence Diagram

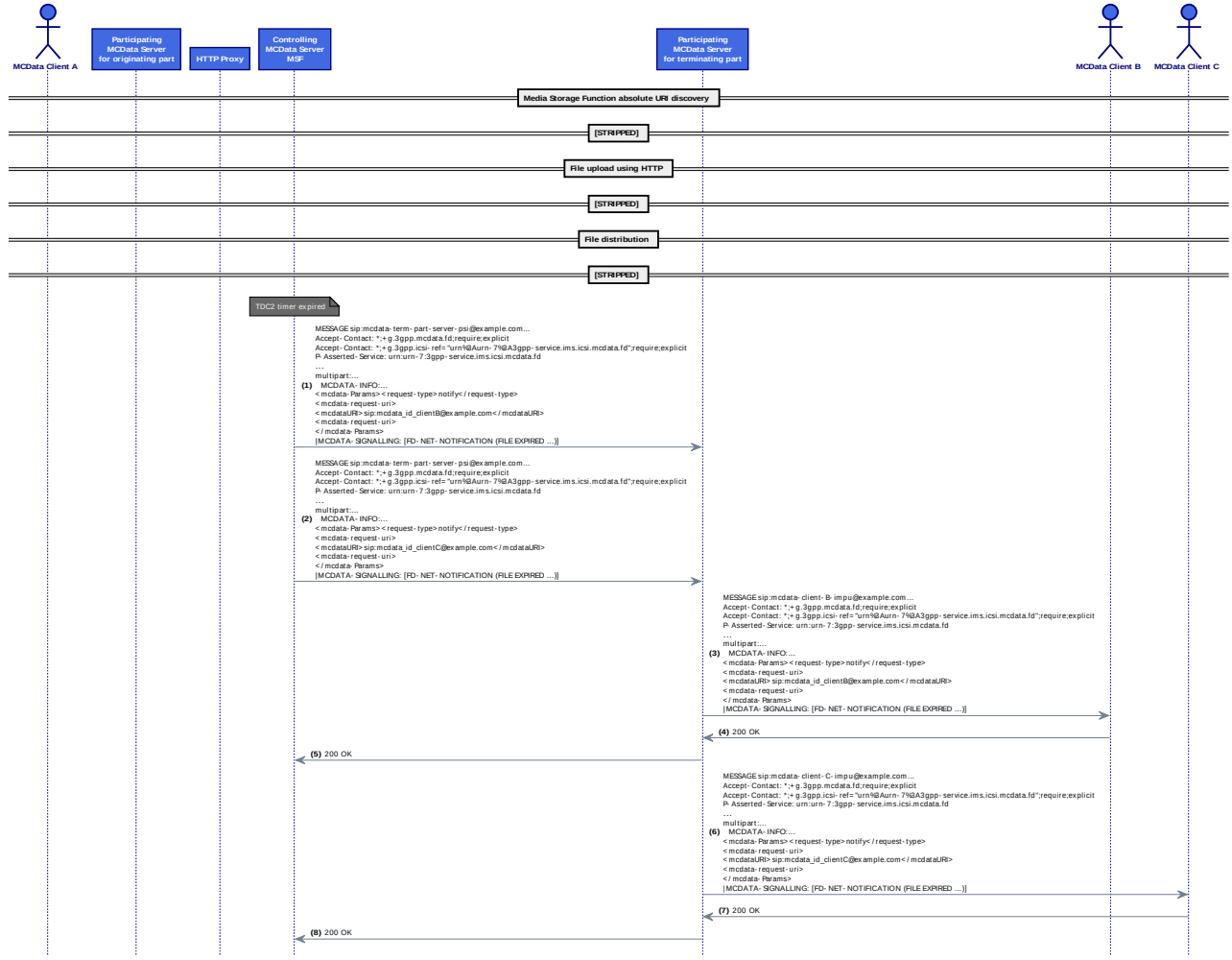

Figure 58: CONN-MCDATA/NET/FD/01 Message Sequence

Message Details

`Trace Pending`

Interoperability Test Description

Table 67: CONN-MCDATA/NET/FD/01 ITD

Interoperability Test Description			
Identifier	CONN-MCDATA/NET/FD/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling		
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 [6] and other references in ETSI TS 124 379 [9]) • HTTP (see IETF RFC 7230 [38]) • TLS (see IETF RFC 5246 [39]) • SSL (see IETF RFC 6101 [40])		
Applicability	• MCData-Client_ONN-MCData-FD-SP (clause 6.2) • MCData-Part_ONN-MCData-FD-SP (clause 6.9) • MCData-Ctrl_ONN-MCData-FD-SP (clause 6.10)		
	•		
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 • Client A has already uploaded a file using HTTP		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	File availability timer TDC2 expires in controlling server
	2	check	Controlling server identifies MCData clients which have not downloaded the file
	3	check	Controlling server sends a SIP MESSAGE to the participating server of each MCData client
	4	check	SIP MESSAGE contains a 'file expired' network notification
	5	check	Participating server forwards SIP MESSAGE to MCData client
	6	check	MCData client processes the file expired notification

7.2.54 MCVideo User initiates an on-demand private MCVideo call in automatic commencement mode with transmission control [CONN-MCVIDEO/ONN/PRIV/AUTO/ONDEM/WFC/NFC/01]

This test shall verify a pure private automatic on-demand call with transmission control and MCVideo users in the same MC system as defined in clause 7.2.2.3.1 in [3]. Specific procedures for private MCVideo calls with transmission control are defined in clause 10.2.2 in [7].The automatic commencement model indicates the terminating Client will take the call without interacting with the User (see [31] 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 [9]).

Message Sequence Diagram

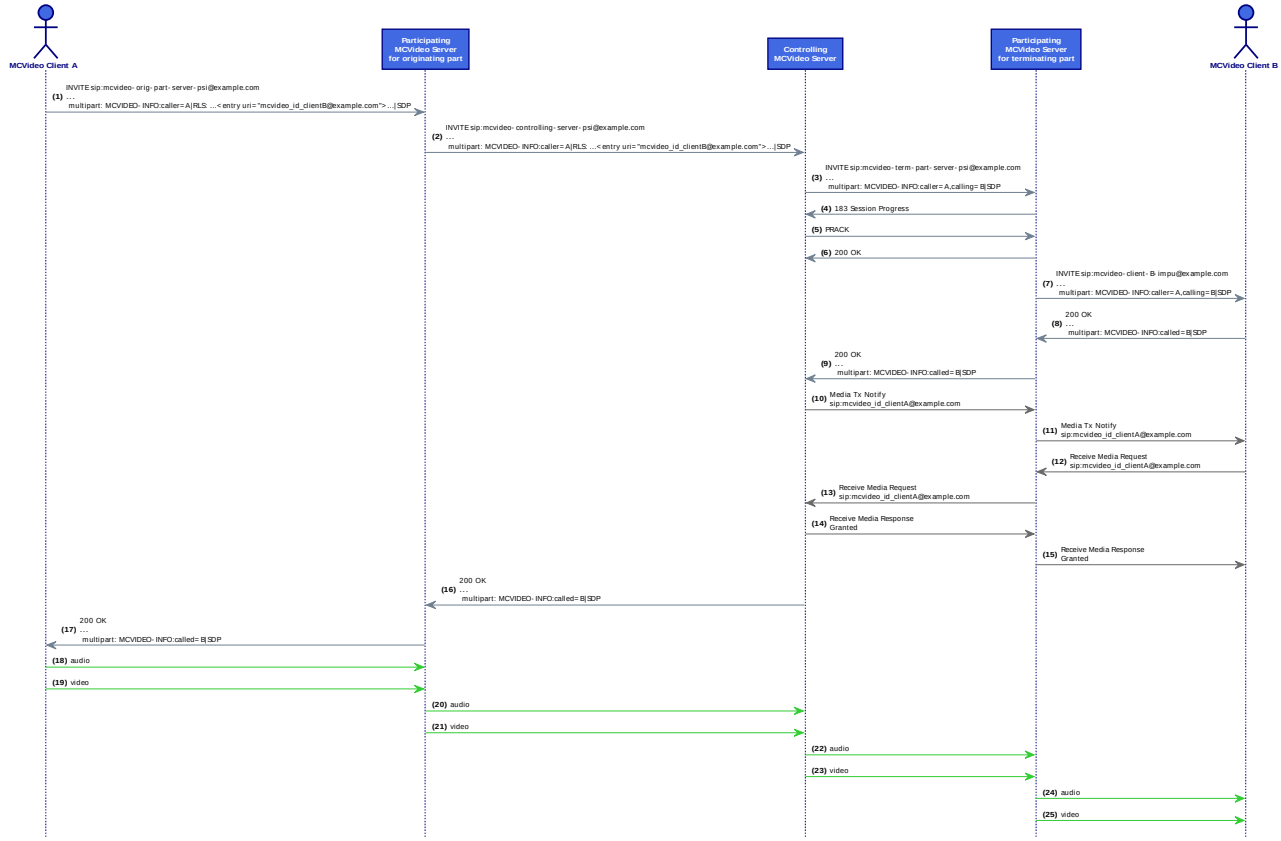

Figure 59: CONN-MCVIDEO/ONN/PRIV/AUTO/ONDEM/WFC/NFC/01 Message Sequence

Message Details

```
[1] INVITE MCVideo Caller/UE --> MCVideo Participating
INVITE sip:mcvideo-server-orig-part-psi@example.com SIP/2.0 Via: SIP/2.0/UDP IP:PORT;branch=BRANCH
From: <sip:mcvideo-client-A-impu@example.com>;tag=TAG
To: <sip:mcvideo-server-orig-part-psi@example.com>
Contact: <sip:mcvideo-client-A-impu@IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3 A3gpp-
service.ims.icsi.mcvideo";+g.3gpp.mcvideo ...
Accept-Contact: *;+g.3gpp.mcvideo;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3
A3gpp-service.ims.icsi.mcvideo";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcvideo
[Privacy: id]
P-Preferred-Identity: <sip:mcvideo-client-A-impu@example.com>
Answer-Mode: Auto
Content-Type: multipart/mixed; boundary=[boundary]
--[boundary]
Content-Type: application/vnd.3gpp.mcvideo-info+xml
<?xml version="1.0" encoding="UTF-8"?>
<mcvideoinfo xmlns="urn:3gpp:ns:mcvideoInfo:1.0" xmlns:xsi=" http://www.w3.org/2001/XMLSchema-
instance">
<mcvideo-Params>
<session-type>private</session-type>
</mcvideo-Params>
</mcvideoinfo>
--[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="mcvideo_id_clientB@example.com" cc:copyControl="to"/> </list>
</resource-lists>
--[boundary]
Content-Type: application/sdp Content-Type: application/sdp
v=0 o=MCVIDEOCLIENT 1183811731 4248272445 IN IP4 IP s=c=IN IP4 IP t=0 0
```

```
m=audio AUDIO_PORT RTP/AVP 105 i=audio component of MCVideo 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=video VIDEO_PORT RTP/AVP 97 i=video component of MCVideo a=rtpmap:97 H264/90000
a=fmtp:97 profile-level-id=640c1f;max-fps=3000 a=sendrecv a=direction:both m=application TC_PORT udp
MCVideo a=fmtp:MCVideo mc_queueing;mc_priority=5;mc_granted;mc_implicit_request ...
--[boundary]--
```

Interoperability Test Description

Table 68: CONN-MCVIDEO/ONN/PRIV/AUTO/ONDEM/WFC/NFC/01 ITD

Interoperability Test Description			
Identifier	CONN-MCVIDEO/ONN/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 [6] and other references in ETSI TS 124 281 [7]) • TC (see ETSI TS 124 581 [15] and other references in ETSI TS 124 281 [7]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 281 [7])		
Applicability	• MCVideo-Client_ONN-MCVideo-CALL, MCPTT-Client_AMRWB, MCVideo-Client_H264, MCVideo-Client_AFFIL, MCVideoClient_ONN-MCVideo-TC (clause 6.2) • MCVideo-Part_ONN-MCVideo-CALL, MCVideo-Part_AFFIL, MCVideo-Part_ONN-MCVideo-TC (clause 6.7) • MCVideo-Ctrl_ONN-MCVideo-CALL, MCVideo-Ctrl_AFFIL (clause 6.8)		
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 ctrl. and part. servers • UEs properly registered to the SIP core/IMS and MC system		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcvideo_id_clientA@example.com) calls User 2 (mcvideo_id_clientB@example.com)
	2	check	INVITE received at part. server of User 1
	3	check	part. server adapts the mcvideo-info and creates INVITE to ctrl. server
	4	check	ctrl. server forwards INVITE to part. server of callee
	5	check	Upon arrival of the INVITE at User 2 the call is automatically taken
	6	check	Media Tx Notify received at terminating part. server
	7	check	Media Tx Notify received at mcvideo_id_clientB
	8	check	Receiver accepts media with a Receive Media Request
	9	check	Receive Media Request received at part. server
	10	check	Receive Media Request received at ctrl. server
	11	check	ctrl. server sends Receive Media Response with Granted result
	12	check	Receive Media Response received at part. server
	13	check	Receive Media Response received at mcvideo_id_clientB
	14	verify	Call connected and media flows exchanged

7.2.55 MCVideo User initiates an on-demand private MCVideo call in automatic commencement mode without transmission control [CONN-MCVIDEO/ONN/PRIV/AUTO/ONDEM/WOFC/01]

This test shall verify a pure MCVideo private automatic on-demand call without transmission control and MCVideo users in the same MC system as defined in clause 7.2.2.3.1 in [3] Specific procedures for private calls without transmission control are defined in clause 10.2.3 in [7].

More specifically, when the MCVideo user wants to make an on-demand MCVideo private call without transmission control, the MCVideo client shall follow the procedures in clause 10.2.2.2.1 in [7] (those shown in clause 7.2.54) but not including any Implicit transmission control mechanism and removing the media-level section for the media transmission control entity.

Message Sequence Diagram

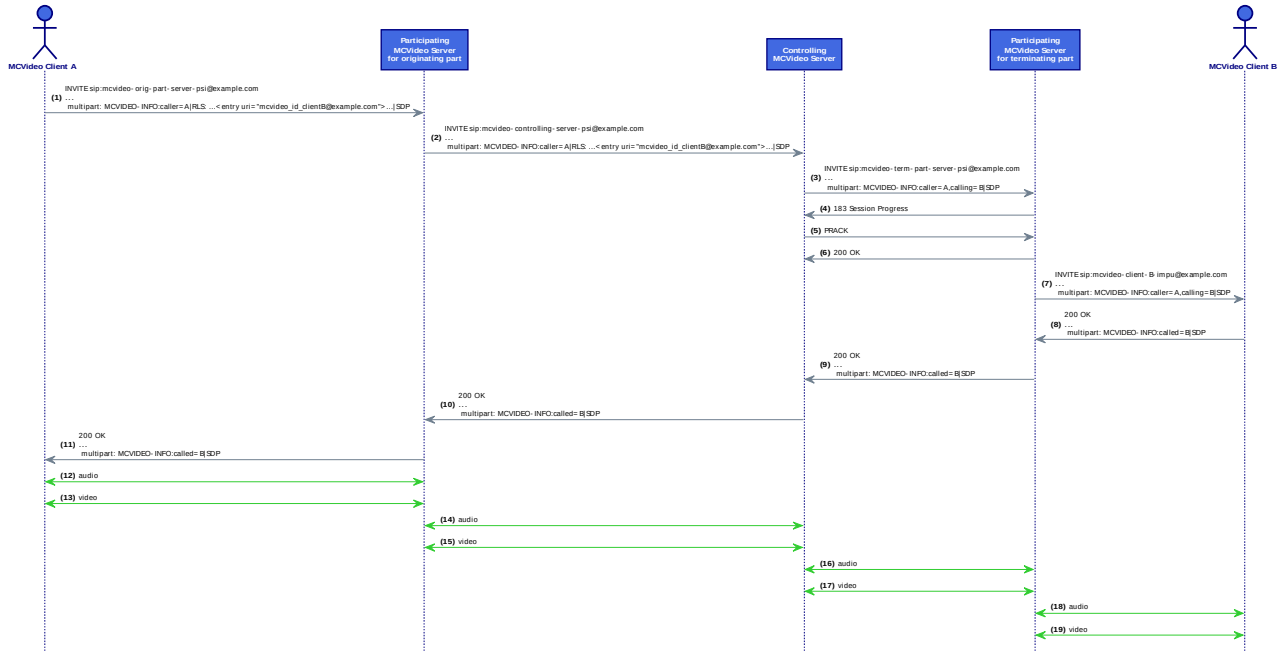

Figure 60: CONN-MCVIDEO/ONN/PRIV/AUTO/ONDEM/WOFC/01 Message Sequence

Message Details

```
[1] INVITE MCVideo Caller/UE --> MCVideo Participating
INVITE sip:mcvideo-server-orig-part-psi@example.com SIP/2.0
Via: SIP/2.0/UDP IP:PORT;branch=BRANCH
From: <sip:mcvideo-client-A-impu@example.com>;tag=TAG
To: <sip:mcvideo-server-orig-part-psi@example.com>
Contact: <sip:mcvideo-client-A-impu@IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3 A3gpp-
service.ims.icsi.mcvideo";+g.3gpp.mcvideo ...
Accept-Contact: *;+g.3gpp.mcvideo;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3
A3gpp-service.ims.icsi.mcvideo";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcvideo
[Privacy: id]
P-Preferred-Identity: <sip:mcvideo-client-A-impu@example.com>
Answer-Mode: Auto
Content-Type: multipart/mixed; boundary=[boundary]
--[boundary]
Content-Type: application/vnd.3gpp.mcvideo-info+xml
<?xml version="1.0" encoding="UTF-8"?>
<mcvideoinfo xmlns="urn:3gpp:ns:mcvideoInfo:1.0" xmlns:xsi=" http://www.w3.org/2001/XMLSchema-
instance">
<mcvideo-Params>
<session-type>private</session-type>
</mcvideo-Params>
</mcvideoinfo>
--[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="mcvideo_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 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=video VIDEO_PORT RTP/AVP 97 i=video component of
MCVideo a=rtpmap:97 H264/90000 a=fmtp:97 profile-level-id=640c1f;max-fps=3000 a=sendrecv
a=direction:both
==> NOTE: REMOVED LINES
-- m=application TC_PORT udp MCVideo
-- a=fmtp:MCVideo mc_queueing;mc_priority=5;mc_granted;mc_implicit_request
========================================================= ...
--[boundary]
```

Interoperability Test Description

Table 69: CONN-MCVIDEO/ONN/PRIV/AUTO/ONDEM/WOFC/01 ITD

Interoperability Test Description			
Identifier	CONN-MCVIDEO/ONN/PRIV/AUTO/ONDEM/WOFC/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of a private MCVideo call without transmission 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 [6] and other references in ETSI TS 124 281 [7]) • TC (see ETSI TS 124 581 [15] and other references in ETSI TS 124 281 [7]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 281 [7])		
Applicability	• MCVideo-Client_ONN-MCVideo-CALL, MCPTT-Client_AMR-WB, MCVideo-Client_H264, MCVideo-Client_AFFIL (clause 6.2) • MCVideo-Part_ONN-MCVideo-CALL, MCVideo-Part_AFFIL, MCVideo-Part_ONN-MCVideo-TC (clause 6.7) • MCVideo-Ctrl_ONN-MCVideo-CALL, MCVideo-Ctrl_AFFIL (clause 6.8)		
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 MC system		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	User 1 (mcvideo_id_clientA@example.com) calls User 2 (mcvideo_id_clientB@example.com)
	2	check	Dialog creating INVITE received at the MCVideo participating server of User1
	3	check	The participating server adapts the mcvideo-info accordingly and creates an INVITE to the controlling server
	4	check	The controlling server checks permissions and forwards 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

7.2.56 MCVideo User initiates an on-demand prearranged MCVideo Group Call [CONNMCVIDEO/ONN/GROUP/PREA/ONDEM/NFC/01]

This test comprises the establishment an on-demand prearranged MCVideo Group Call. Apart from SIP signalling transmission control will be also evaluated in this test, as an explicit request from the receiving user is always required to start with the RTP transmission. However just the basic functionality will be tested here. A deeper testing of transmission control procedures will be carried out in specific test cases.

Note that in this test case and following diagrams do not consider the triggering and possible effects of (un)successful implicit affiliation in the MCVideo part. server for the case when the calling is not affiliated to the group identified in the "SIP INVITE request for originating part. MCVideo function" as determined by clause 9.2.2.2.11 in [7].

Similarly, unless specified no emergency or imminent peril conditions will be signalled.

Message Sequence Diagram

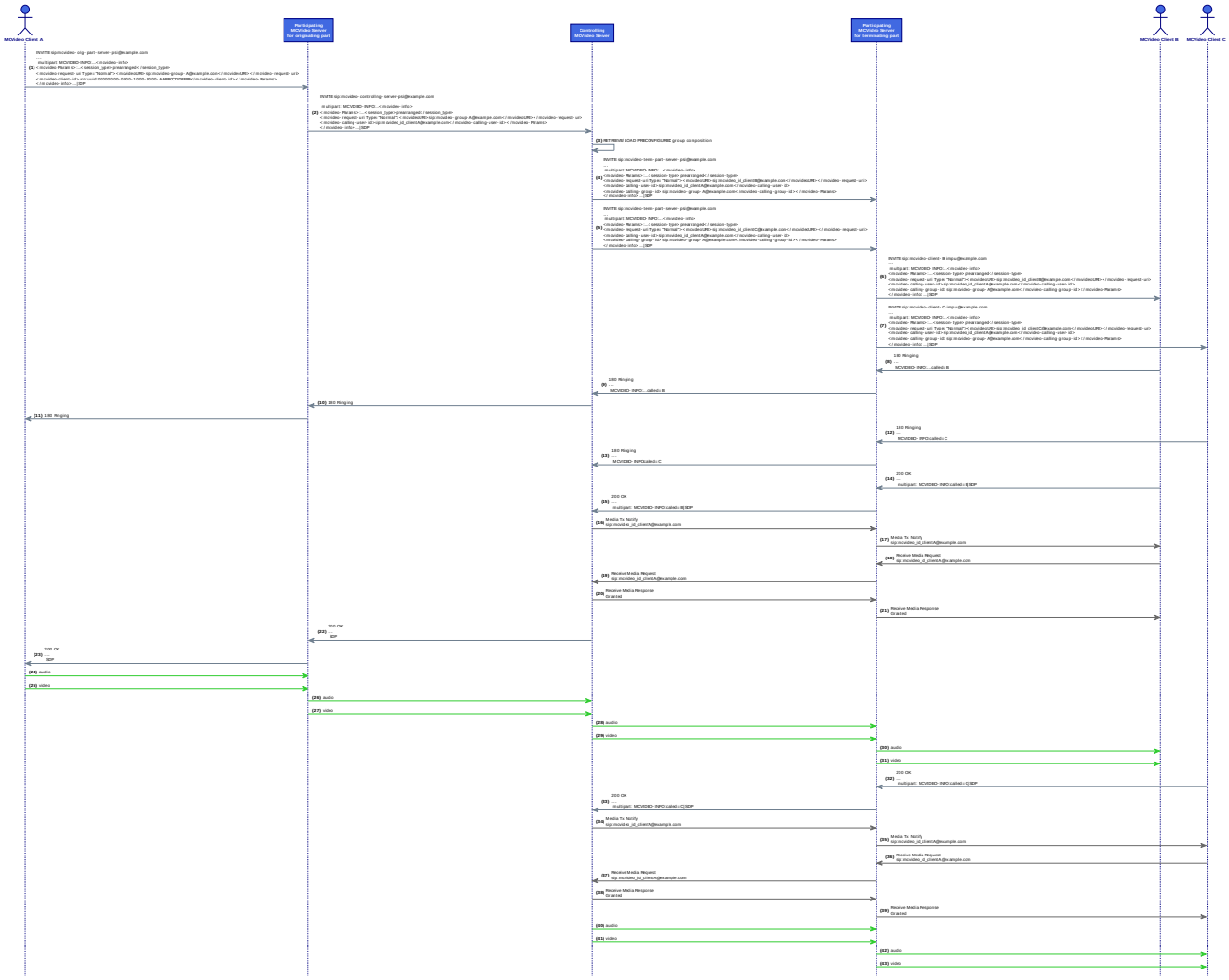

Figure 61: CONN-MCVIDEO/ONN/GROUP/PREA/ONDEM/NFC/01 Message Sequence

Message Details

```
[1] INVITE MCVideo Caller/UE --> MCVideo Participating
INVITE sip:mcvideo-server-orig-part-psi@example.com SIP/2.0
To: <sip:mcvideo-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3 A3gpp-
service.ims.icsi.mcvideo";+g.3gpp.mcvideo
Accept-Contact: *;+g.3gpp.mcvideo;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcvideo ";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcvideo
P-Preferred-Identity: <sip:mcvideo-clientA@example.com>
Answer-Mode: Manual
Resource-Priority: mcpttp.5
Content-Type: multipart/mixed; boundary=[boundary]
--[boundary]
Content-Type: application/sdp
v=0 o=MCVIDEOCLIENT 1183811731 4248272445 IN IP4 IP s=c=IN IP4 IP t=0 0 m=audio AUDIO_PORT RTP/AVP
105 i=audio component of MCVideo 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=video VIDEO_PORT
RTP/AVP 97 i=video component of MCVideo a=rtpmap:97 H264/90000 a=fmtp:97 profile-level-
id=640c1f;max-fps=3000 a=sendrecv a=direction:both m=application TC_PORT udp MCVideo a=fmtp:MCVideo
mc_queueing;mc_priority=5;mc_granted;mc_implicit_request ...
--[boundary]
Content-Type: application/vnd.3gpp.mcvideo-info+xml
<?xml version="1.0" encoding="UTF-8"?>
<mcvideoinfo xmlns="urn:3gpp:ns:mcvideoInfo:1.0" xmlns:xsi=" http://www.w3.org/2001/XMLSchema-
instance">
<mcvideo-Params>
<session-type>prearranged</session-type>
```

```
<mcvideo-request-uri type="Normal">
<mcvideoURI>sip:mcvideo-group-A@example.com</mcvideoURI>
</mcvideo-request-uri>
<mcvideo-client-id type="Normal">
<mcvideoString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF<
/mcvideoString>
</mcvideo-client-id>
</mcvideo-Params>
</mcvideoinfo>
--[boundary]
[2] INVITE MCVideo Participating --> MCVideo Controlling
INVITE sip:mcvideo-controlling-server-psi@example.com SIP/2.0
To: <sip:mcvideo-controlling-server-psi@example.com> ...
--[boundary]
Content-Type: application/sdp
...
--[boundary]
Content-Type: application/vnd.3gpp.mcvideo-info+xml
<?xml version="1.0" encoding="UTF-8"?>
<mcvideoinfo xmlns="urn:3gpp:ns:mcvideoInfo:1.0" xmlns:xsi=" http://www.w3.org/2001/XMLSchema-
instance">
<mcvideo-Params>
<session-type>prearranged</session-type>
<mcvideo-request-uri type="Normal">
<mcvideoURI>sip:mcvideo-group-A@example.com</mcvideoURI>
</mcvideo-request-uri>
<mcvideo-calling-user-id type="Normal">
<mcvideoURI>sip:mcvideo_id_clientA@example.com</mcvideoURI>
</mcvideo-calling-user-id>
</mcvideo-Params>
</mcvideoinfo>
--[boundary] ...
...
```

Interoperability Test Description

Table 70: CONN-MCVIDEO/ONN/GROUP/PREA/ONDEM/NFC/01 ITD

Interoperability Test Description	
Identifier	CONN-MCVIDEO/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 [6] and other references in ETSI TS 124 281 [7]) • TC (see ETSI TS 124 581 [15] and other references in ETSI TS 124 281 [7]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])
Applicability	• MCVideo-Client_ONN-MCVideo-CALL, MCPTT-Client_AMRWB, MCVideo-Client_H264, MCVideo-Client_AFFIL, MCVideoClient_ONN-MCVideo-TC (clause 6.2) • MCVideo-Part_ONN-MCVideo-CALL, MCVideo-Part_AFFIL, MCVideo-Part_ONN-MCVideo-TC (clause 6.7) • MCVideo-Ctrl_ONN-MCVideo-CALL, MCVideo-Ctrl_AFFIL (clause 6.8)
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 ctrl. and part. servers • UEs properly registered to the SIP core/IMS and MC system • Calling user is affiliated to the called group

Test Sequence	Step	Type	Description
	1	stimulus	User 1 (mcvideo_id_clientA@example.com) calls mcvideo-group-A
	2	check	INVITE received at part. server of mcvideo_id_clientA@example.com
	3	check	INVITE received at ctrl. server
	4	check	ctrl. server loads the affiliated members of mcvideogroup-A and creates an INVITE per each of the "n" members
	5	check	"n" INVITEs received at part. servers of each mcvideo_id_clientX (where X:1..n)
	6	check	"n" INVITEs received at affiliated mcvideo_id_clientX
	7	check	"n" SIP dialogs established
	8	check	"n" Media Tx Notify received at part. servers
	9	check	"n" Media Tx Notify received at affiliated mcvideo_id_clientX
	10	check	"n" Receivers accept the media with a Receive Media Request
	11	check	"n" Receive Media Request received at part. servers
	12	check	"n" Receive Media Request received at ctrl. server
	13	check	"n" ctrl. server sends Receive Media Response with result Granted
	14	check	"n" Receive Media Response received at part. servers
	15	check	"n" Receive Media Response received at each mcvideo_id_clientX
	16	verify	Call connected and multiple media flows exchanged

7.2.57 MCVideo User initiates an on-demand Chat Group Call [CONN-MCVIDEO/ONNGROUP/CHAT/ONDEM/NFC/01]

This test comprises an on-demand chat MCVideo Group Call. As in clause 7.2.56 apart from SIP signalling basic transmission control will be also evaluated. However advanced transmission control mechanisms will be further considered in specific tests.

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

Furthermore, for simplicity purposes no emergency/imminent peril condition will be signalled either by the initial INVITE or the subsequent ones (one per user joining). Therefore most of the associated clauses indicated in ETSI TS 124 281 [7], clauses 9.2.2.2.1.1, 9.2.2.3.1.1, 9.2.2.3.1.3 and 9.2.2.4.1.1 will not take effect. The status of the ongoing chat MCVideo Group Call will therefore be always no emergency/imminent peril. As a result, the MCVideo ctrl. function will 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 will not be considered.

Message Sequence Diagram

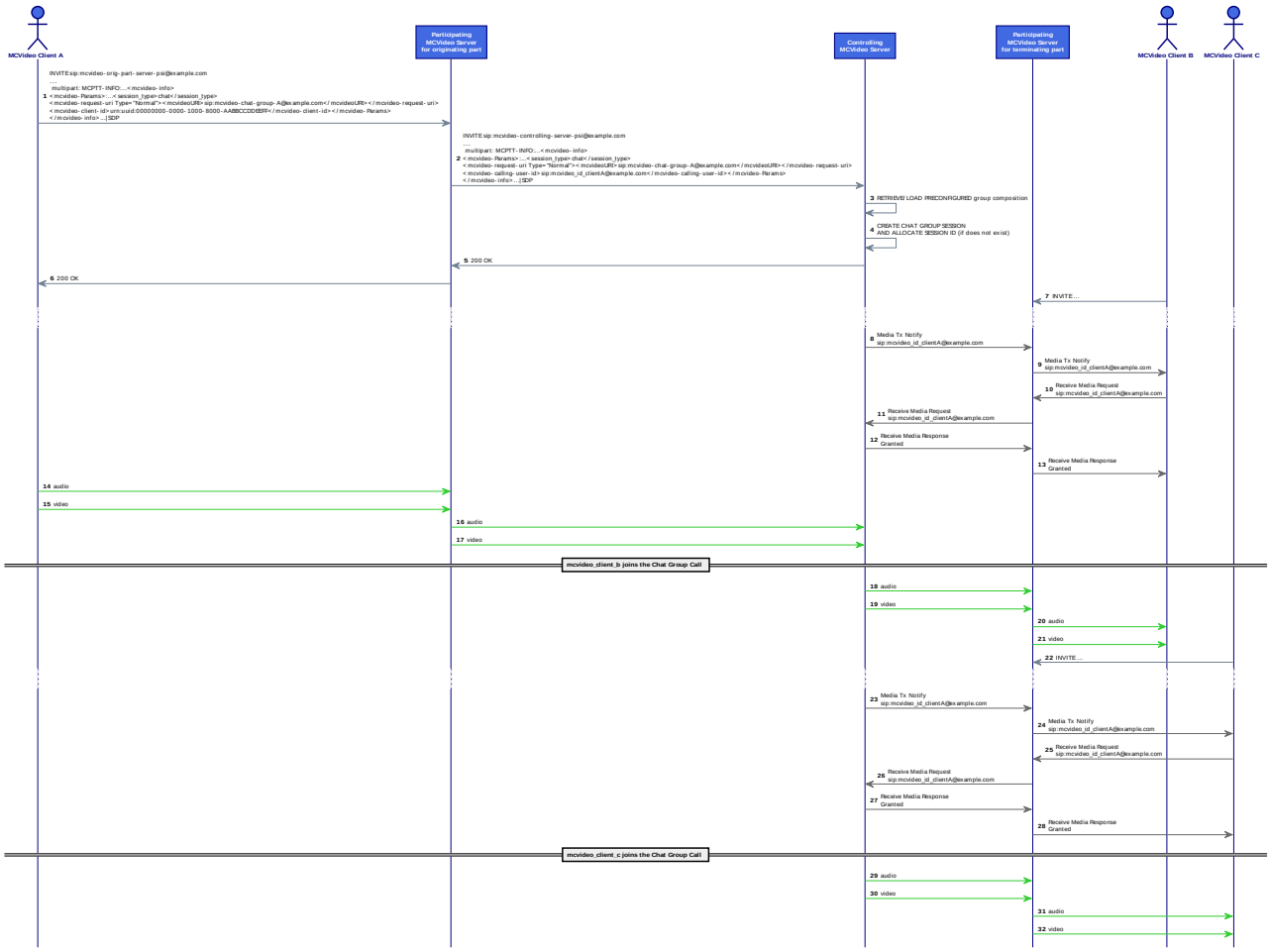

Figure 62: CONN-MCVIDEO/ONNGROUP/CHAT/ONDEM/NFC/01 Message Sequence

Message Details

```
[1] INVITE MCVideo Caller/UE --> MCVideo Participating
INVITE sip:mcvideo-server-orig-part-psi@example.com SIP/2.0
To: <sip:mcvideo-server-orig-part-psi@example.com>
Contact: <sip:IP:PORT>;+g.3gpp.icsi-ref="urn%3Aurn-7%3 A3gpp-
service.ims.icsi.mcvideo";+g.3gpp.mcvideo
Accept-Contact: *;+g.3gpp.mcvideo;require;explicit
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mcvideo ";require;explicit
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mcvideo
P-Preferred-Identity: <sip:mcvideo-clientA@example.com>
Answer-Mode: Manual
Resource-Priority: mcpttp.5
Content-Type: multipart/mixed; boundary=[boundary]
--[boundary]
Content-Type: application/sdp
v=0 o=MCVIDEOCLIENT 1183811731 4248272445 IN IP4 IP s=c=IN IP4 IP t=0 0 m=audio AUDIO_PORT RTP/AVP
105 i=audio component of MCVideo 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=video VIDEO_PORT
RTP/AVP 97 i=video component of MCVideo a=rtpmap:97 H264/90000
a=fmtp:97 profile-level-id=640c1f;max-fps=3000 a=sendrecv a=direction:both m=application TC_PORT udp
MCVideo a=fmtp:MCVideo mc_queueing;mc_priority=5;mc_granted;mc_implicit_request ...
--[boundary]
Content-Type: application/vnd.3gpp.mcvideo-info+xml
<?xml version="1.0" encoding="UTF-8"?>
<mcvideoinfo xmlns="urn:3gpp:ns:mcvideoInfo:1.0" xmlns:xsi=" http://www.w3.org/2001/XMLSchema-
instance">
<mcvideo-Params>
<session-type>chat</session-type>
<mcvideo-request-uri type="Normal">
<mcvideoURI>sip:mcvideo-group-A@example.com</mcvideoURI>
```

```
</mcvideo-request-uri>
<mcvideo-client-id type="Normal">
<mcvideoString>urn:uuid:00000000-0000-1000-8000-AABBCCDDEEFF<
/mcvideoString>
</mcvideo-client-id>
</mcvideo-Params>
</mcvideoinfo>
--[boundary]
[2] INVITE MCVideo Participating --> MCVideo Controlling
INVITE sip:mcvideo-controlling-server-psi@example.com SIP/2.0
To: <sip:mcvideo-controlling-server-psi@example.com> ...
--[boundary]
Content-Type: application/sdp ...
--[boundary]
Content-Type: application/vnd.3gpp.mcvideo-info+xml
<?xml version="1.0" encoding="UTF-8"?>
<mcvideoinfo xmlns="urn:3gpp:ns:mcvideoInfo:1.0" xmlns:xsi=" http://www.w3.org/2001/XMLSchema-
instance">
<mcvideo-Params>
<session-type>chat</session-type>
<mcvideo-request-uri type="Normal">
<mcvideoURI>sip:mcvideo-group-A@example.com</mcvideoURI>
</mcvideo-request-uri>
<mcvideo-calling-user-id type="Normal">
<mcvideoURI>sip:mcvideo_id_clientA@example.com</mcvideoURI>
</mcvideo-calling-user-id>
</mcvideo-Params>
</mcvideoinfo>
--[boundary] ...
...
```

Interoperability Test Description

Table 71: CONN-MCVIDEO/ONNGROUP/CHAT/ONDEM/NFC/01 ITD

Interoperability Test Description	
Identifier	CONN-MCVIDEO/ONNGROUP/CHAT/ONDEM/NFC/01
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling of an on-demand MCVideo 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 [6] and other references in ETSI TS 124 281 [7]) • TC (see ETSI TS 124 581 [15] and other references in ETSI TS 124 281 [7]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 281 [7]])
Applicability	• MCVideo-Client_ONN-MCVideo-CALL, MCPTT-Client_AMRWB, MCVideo-Client_H264, MCVideo-Client_AFFIL, MCVideoClient_ONN-MCVideo-TC (clause 6.2) • MCVideo-Part_ONN-MCVideo-CALL, MCVideo-Part_AFFIL, MCVideo-Part_ONN-MCVideo-TC (clause 6.7) • MCVideo-Ctrl_ONN-MCVideo-CALL, MCVideo-Ctrl_AFFIL (clause 6.8)
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 ctrl. and part. servers • UEs properly registered to the SIP core/IMS and MC system and users properly affiliated to the called chat group

Test Sequence	Step	Type	Description
	1	stimulus	User 1 (mcvideo_id_clientA@example.com) calls mcvideo-chat-group-A
	2	check	INVITE received at part. server of mcvideo_id_clientA@example.com
	3	check	INVITE received at ctrl. server
	4	check	ctrl. server loads the affiliated members of the mcvideo-chat-group-A, creates the session and returns a 200 OK to the callee. No (re)INVITE will sent to other members
	5	check	Users 2 and 3 repeat the same procedure
	6	check	SIP dialog established
	7	check	Media Tx Notify received at part. servers
	8	check	Media Tx Notify received at the affiliated mcvideo_id_clientX
	9	check	Receivers accept the media with a Receive Media Request
	10	check	Receive Media Request received at part. servers
	11	check	Receive Media Request received at ctrl. server
	12	check	ctrl. server sends Receive Media Response with result Granted
	13	check	Receive Media Response received at part. servers
	14	check	Receive Media Response received at each mcvideo_id_clientX
	15	verify	Call connected and multiple 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 [10]. 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

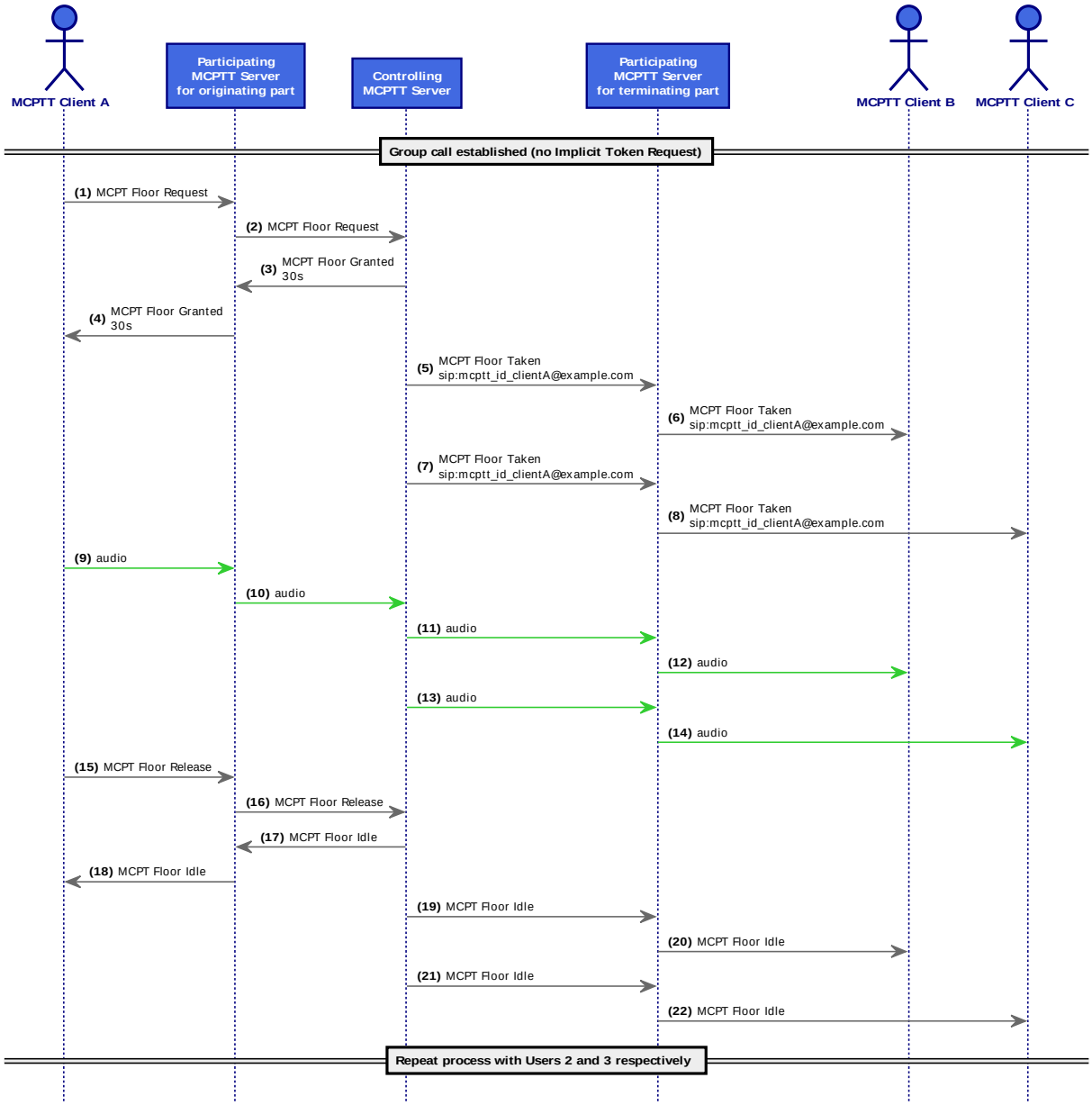

Figure 63: FC/BASIC/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 72: FC/BASIC/01 ITD

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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 [10] 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 in ETSI TS 124 380 [10] 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 in ETSI TS 124 380 [1010] 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

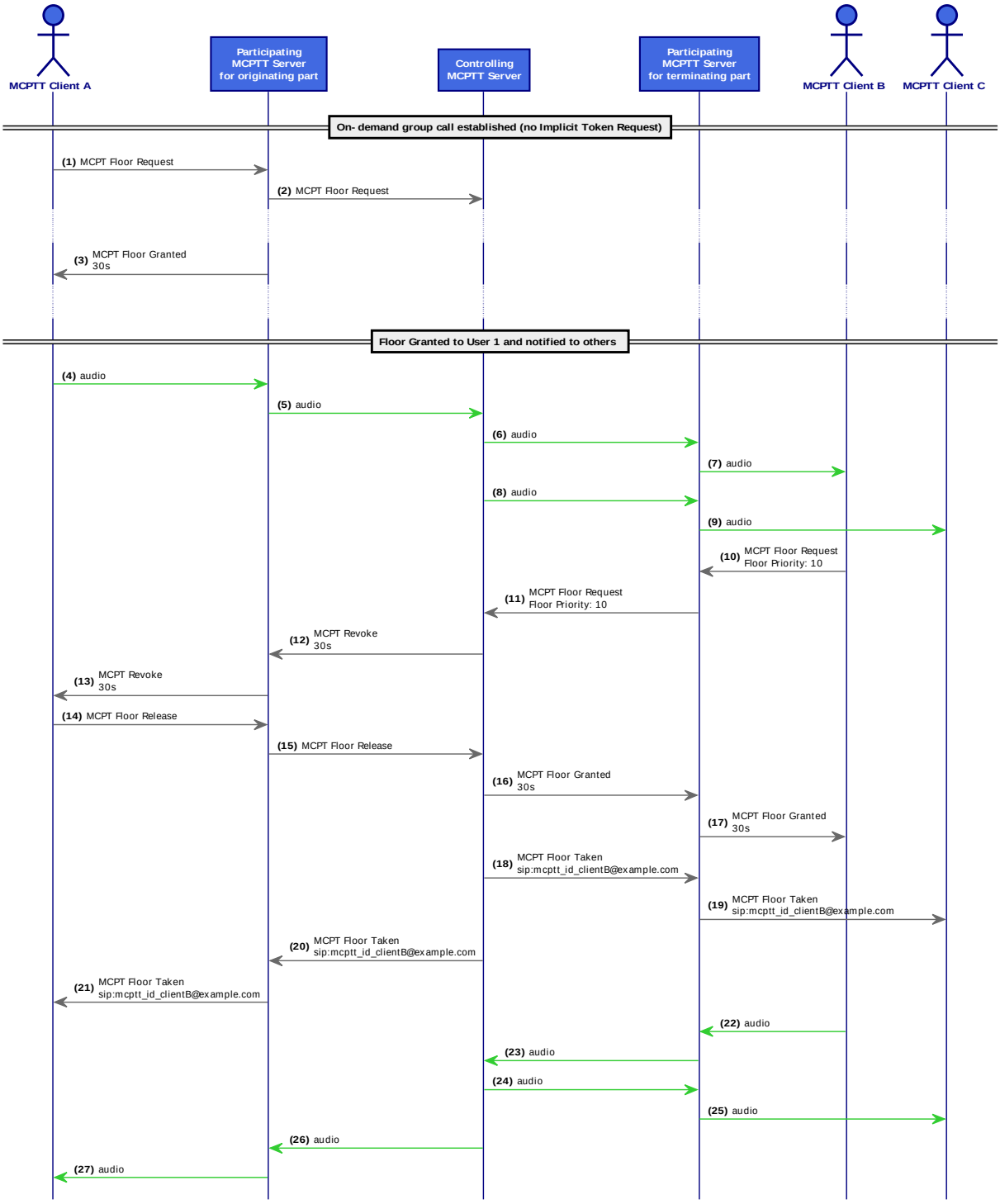

Figure 64: FC/BASIC/02 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 73: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 [12]. 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.

NOTE: MCData and MCVideo define a sibling Registration and Service Authorization mechanism, for the 2nd Plugtests MCPTT will be used to test Registration and Service Authorization.

Message Sequence Diagram

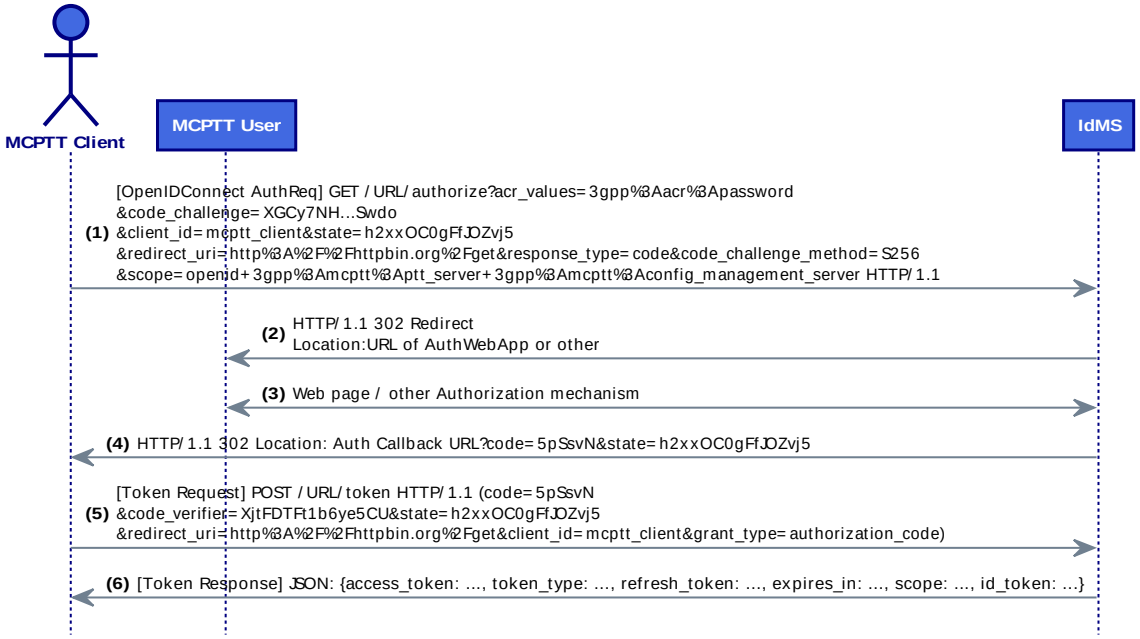

Figure 65: REGAUTH/IDMSAUTH/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 74: 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 [12])		
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 [9]). 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.

NOTE: MCData and MCVideo define a sibling Registration and Service Authorization mechanism, for the 2nd Plugtests MCPTT will be used to test Registration and Service Authorization.

Message Sequence Diagram

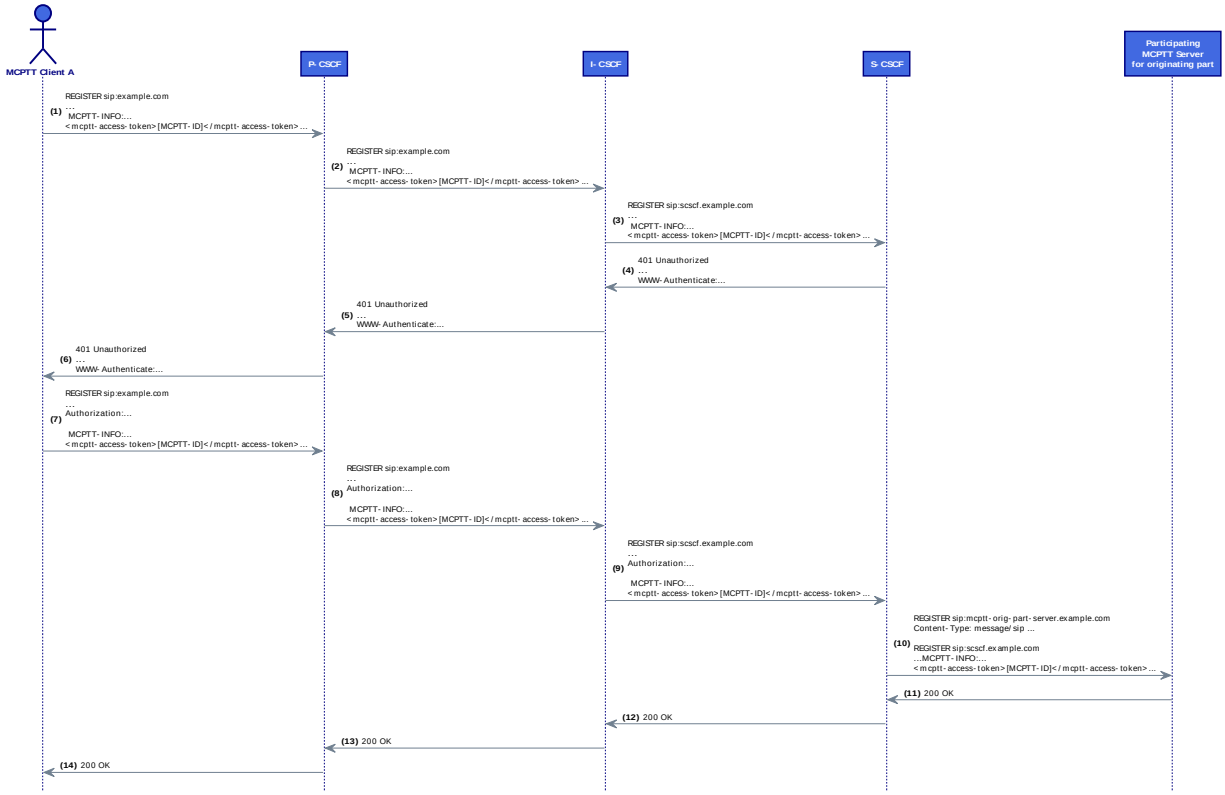

Figure 66: REGAUTH/3PRTYREG/REGISTER/01 Message Sequence

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 75: 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 [6] and other references in ETSI TS 124 379 [9])		
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 [9] 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.

NOTE: MCData and MCVideo define a sibling Registration and Service Authorization mechanism, for the 2nd Plugtests MCPTT will be used to test Registration and Service Authorization.

Message Sequence Diagram

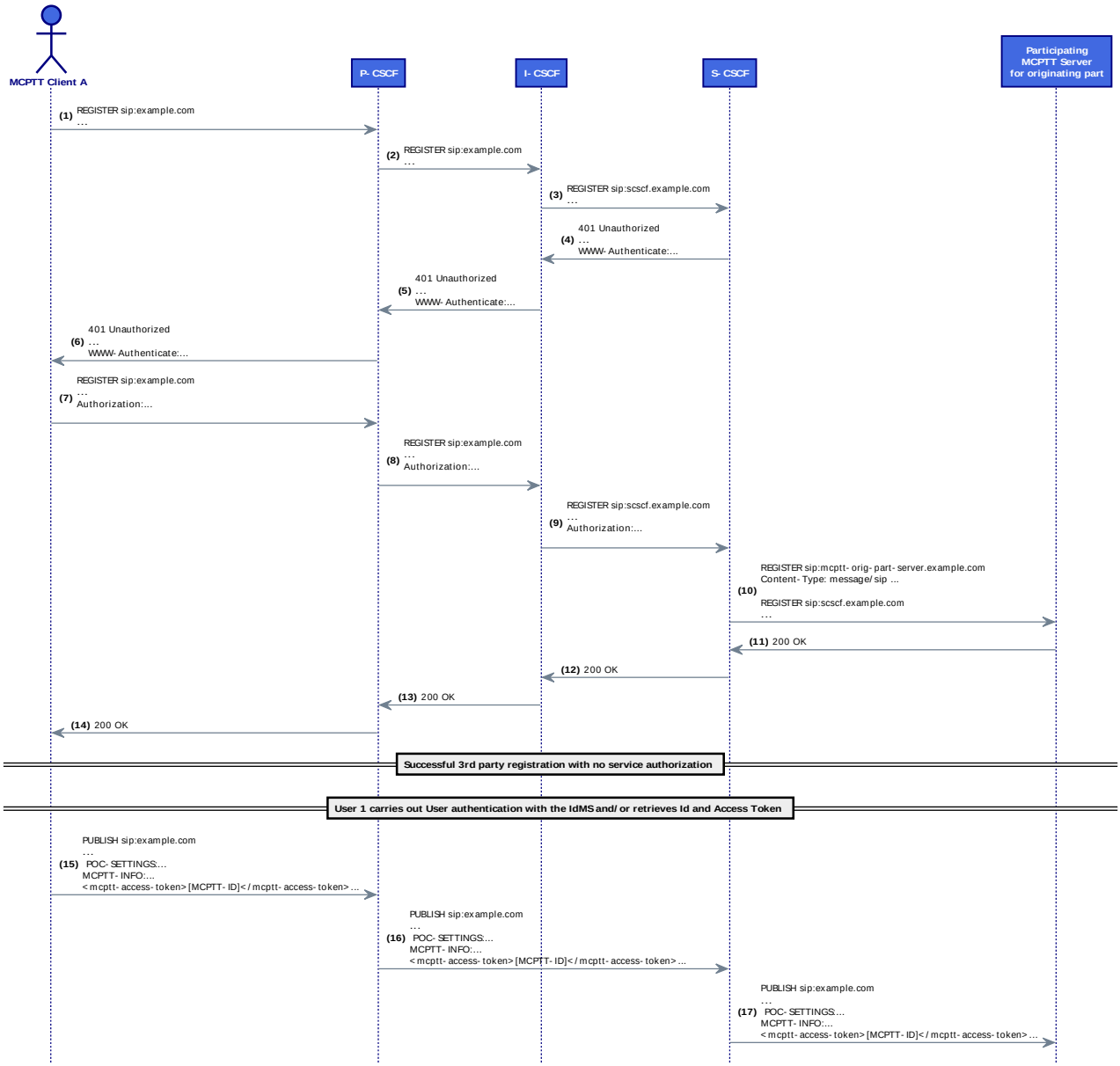

Figure 67: REGAUTH/PUBLISH/REGISTER/01 Message Sequence

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 76: 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 [6] and other references in ETSI TS 124 379 [9])		
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)

7.5.0 General

Although in the 3GPP Release 14 the MCPTT-Pre-emption feature and enhanced shared resources have been introduced in the 2nd Plugtests the basic mechanisms will be evaluated.

Originally on-demand private call was used as an example of a call type responsible for triggering the PCC procedures. Later, Pre-Established Sessions (PES) have been included in clauses 7.5.5 and 7.5.6.

In order to define the test cases for PES there was a debate among the Plugtests community regarding PCC triggering time (i.e. upon PES setup or upon REFER/re-INVITE in PES): Triggering PCC upon PES setup would honor stage 2 rationale "After a pre-established session is established, a media bearer carrying the media and media control messages is always active." and "... avoids the need to negotiate media parameters (including evaluating ICE candidates) and reserving bearer resources during the MC service call/session establishment that results in delayed MC service call/session establishment." (clause 10.3.1 in ETSI TS 123 280 [2]). Although this stage 2 definition would suggest the PCC mechanism should be always triggered upon PES setup, stage 3 definition of procedures do not specify the moment and may allow other approaches. Furthermore, this timing may result in thousands of dormant GBR bearers been allocated regardless being actually used with possibly a relevant impact on radio resources (depending on eNodeB's scheduler in both the uplink and downlink).

On the other hand, triggering upon REFER would not be possible for the PES in the terminating side in clause 7.5.5 in automatic commencement mode since the SIP signalling would not arrive at the IMS core (MCPC would be used instead) and would demand additional REFER parsing logic in P-CSCF.

Considering these constraints and that, from an interface point of view (Rx or MCPTT-5), there would be no difference between both cases, both examples would be provided when possible in clauses 7.5.5 and 7.5.6.

7.5.1 Setup of a 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 Stage 2 ETSI TS 123 379 [4], clauses 5.2.9.3, 9.2.2.3.1, 9.2.2.3.2, 10.11.2 and 10.11.3.

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

Message Sequence Diagram

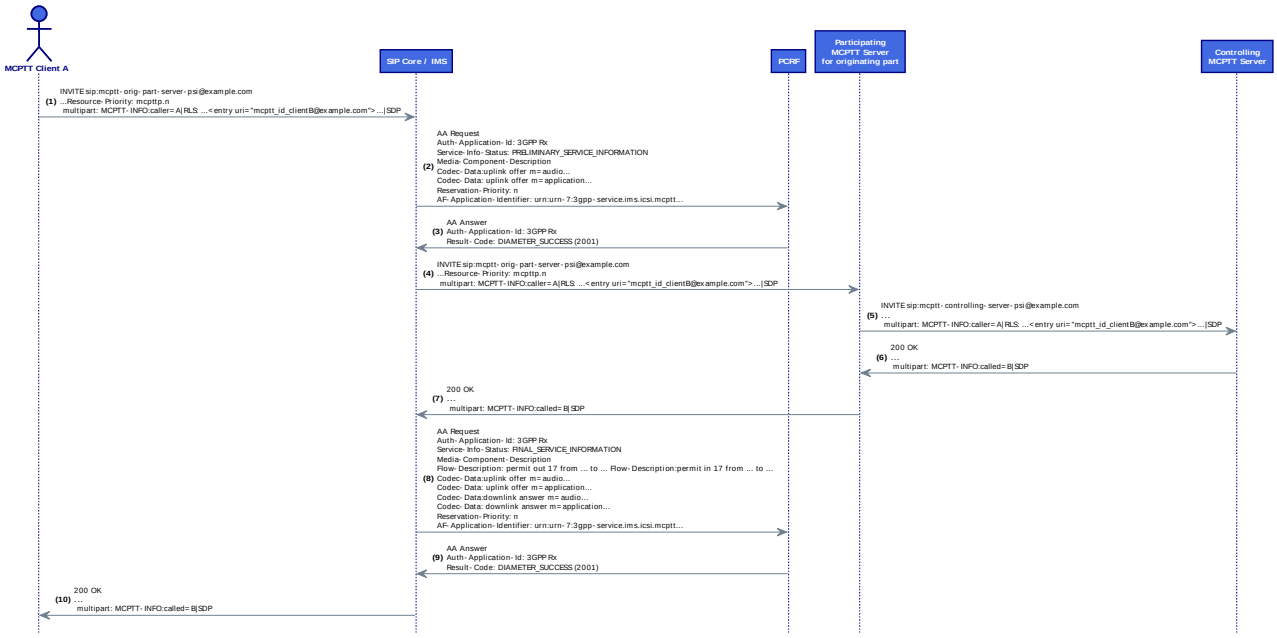

Figure 68: PCC/BEARERSETUP/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 77: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 a 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

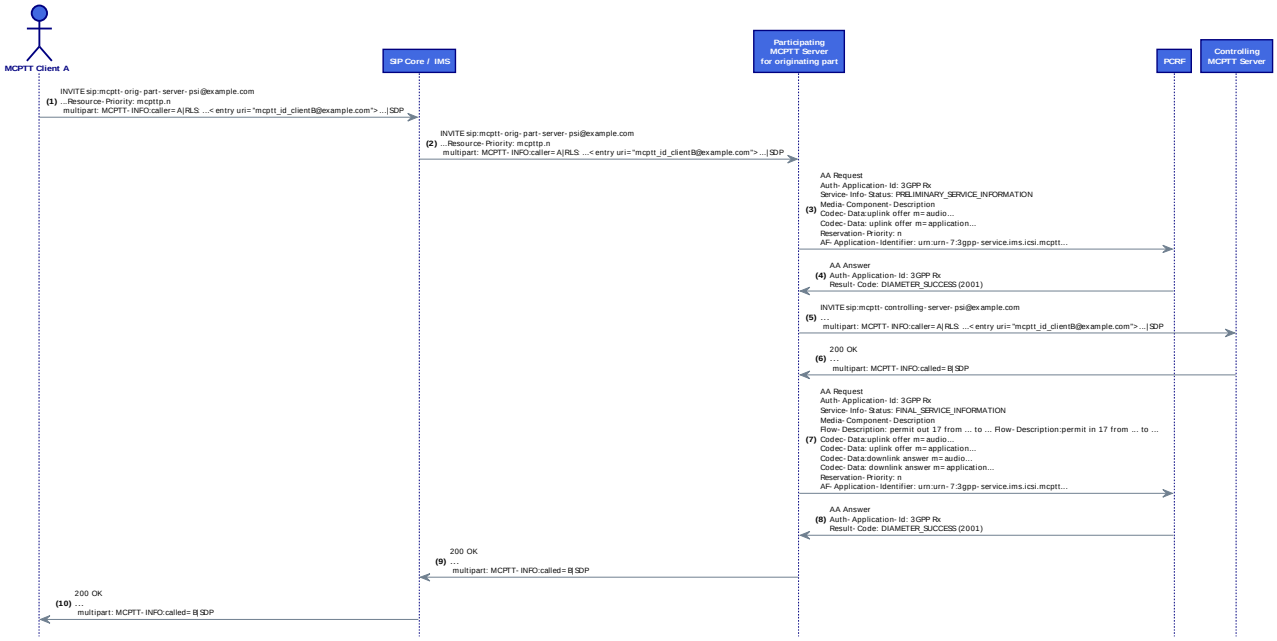

Figure 69: PCC/BEARERSETUP/02 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 78: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 a Unicast MC Bearer by SIP Core/IMS [PCC/BEARERUPDATE/01]

Upon a change in an on-going session's 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

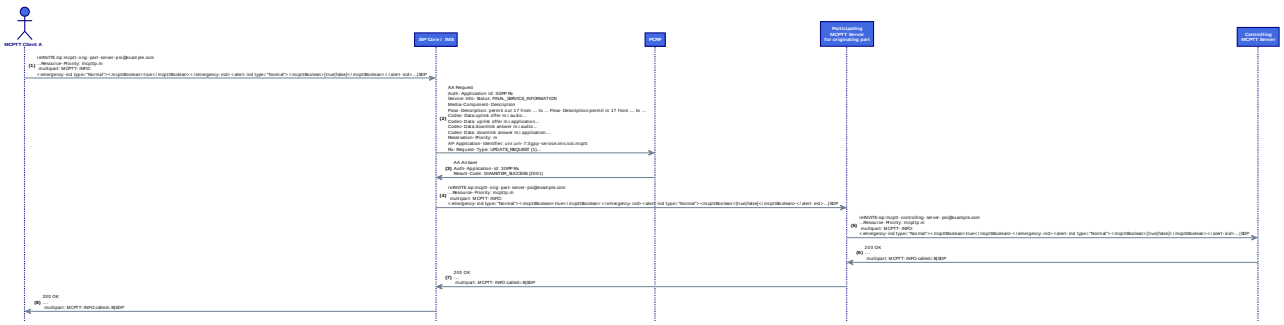

Figure 70: PCC/BEARERUPDATE/01 Message Sequence

Message Details

`Trace Pending`

Interoperability Test Description

Table 79: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 a 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 71: PCC/BEARERUPDATE/02 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 80: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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

7.5.5 Setup of a Unicast MC Bearer by SIP Core/IMS using pre-established sessions [PCC/BEARERSETUP/03]

A SIP/Core IMS compatible with MCPTT specific RX interface definition shall be able to signal required QoS using also pre-established sessions. The overall procedure is defined in Stage 2 ETSI TS 123 379 [44], clauses 5.2.9.3, 9.2.2.3.1, 9.2.2.3.2, 10.11.2 and 10.11.3.

NOTE: Following the rationale in clause 7.5, the triggering of the bearer setup has been considered in two tentative cases: Upon the initial INVITE (during PES setup) or upon the final REFER/REINVITE. As aforementioned, the second case would not be applicable for the terminating side in automatic commencement mode (but yes in manual and imminent peril/emergency calls).

Message Sequence Diagram

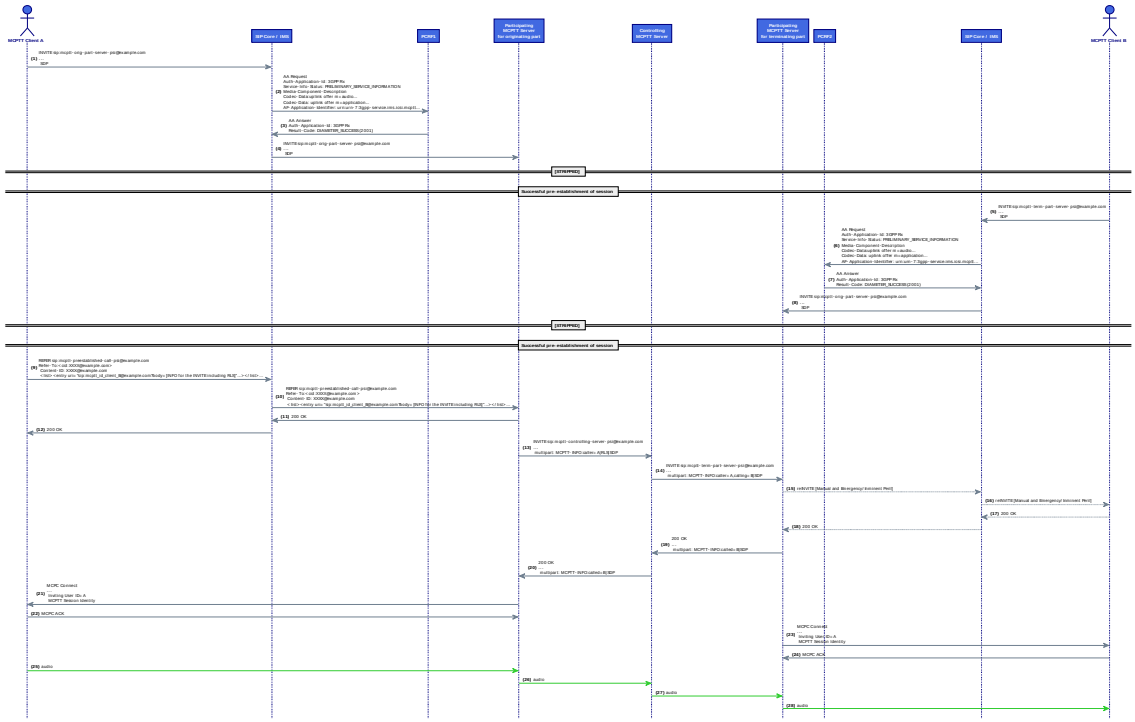

Figure 72: PCC/BEARERSETUP/03 (option a) Message Sequence

Message Details

`Trace Pending`

Interoperability Test Description

Table 81: PCC/BEARERSETUP/03 ITD

Interoperability Test Description	
Identifier	PCC/BEARERSETUP/03
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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])
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 6.7) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.8) • IMS_RX (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, procedure repeated for both ends
	2	check	Dialog creating INVITE received at P-CSCF
	3	check	Sessions pre-established
	4	stimulus	User 1 calls User 2 using pre-established session
	5	check	REFER is created and sent to the participating server of User 1
	6	check	The P-CSCF would be able to parse the REFER and signal via DIAMETER the QoS requirement to the PCRF
	7	check	The participating server creates the proper INVITE with the data embedded in the REFER and forwards it to the controlling
	8	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
	9	check	The participating of the callee notifies him/her by sending an MCPC Connect message (reINVITE in manual or emergency/imminent peril calls)
	10	check	An MCPC Connect message is triggered by the originating participating servers
	11	verify	NOT POSSIBLE in the terminating side (in automatic commencement calls)

Message Sequence Diagram

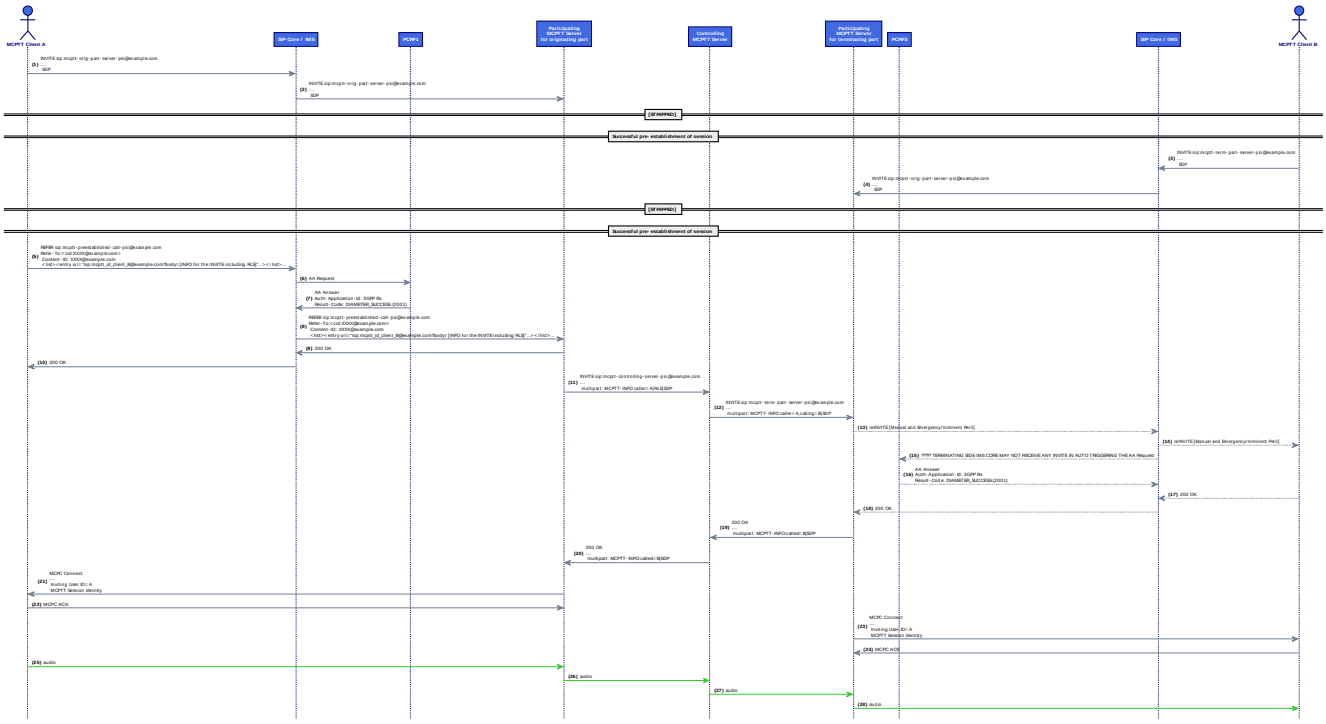

Figure 73: PCC/BEARERSETUP/03 (option b) Message Sequence

Table 82: PCC/BEARERSETUP/03 ITD

Interoperability Test Description			
Identifier	PCC/BEARERSETUP/03		
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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 6.7) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.8) • IMS_RX (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, procedure repeated for both ends
	2	check	Dialog creating INVITE received at P-CSCF
	3	check	Sessions pre-established
	4	stimulus	User 1 calls User 2 using pre-established session
	5	check	REFER is created and sent to the participating server of User 1
	6	check	The P-CSCF would be able to parse the REFER and signal via DIAMETER the QoS requirement to the PCRF
	7	check	The participating server creates the proper INVITE with the data embedded in the REFER and forwards it to the controlling
	8	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
	9	check	The participating of the callee notifies him/her by sending an MCPC Connect message (reINVITE in manual or emergency/imminent peril calls)
	10	check	An MCPC Connect message is triggered by the originating participating servers
	11	verify	NOT POSSIBLE in the terminating side (in automatic commencement calls)

7.5.6 Setup of a Unicast MC Bearer by MCPTT Participating AS using pre-established sessions [PCC/BEARERSETUP/04]

A SIP/Core IMS compatible with MCPTT specific RX interface definition shall be able to signal required QoS using also pre-established sessions. The overall procedure is defined in Stage 2 ETSI TS 123 379 [4], clauses 5.2.9.3, 9.2.2.3.1, 9.2.2.3.2, 10.11.2 and 10.11.3.

NOTE: Following the rationale in clause 7.5, the triggering of the bearer setup has been considered in two tentative cases: Upon the initial INVITE (during PES setup) or upon the final REFER/REINVITE. As aforementioned, the second case would not be applicable for the terminating side in automatic commencement mode (but yes in manual and imminent peril/emergency calls).

Message Sequence Diagram

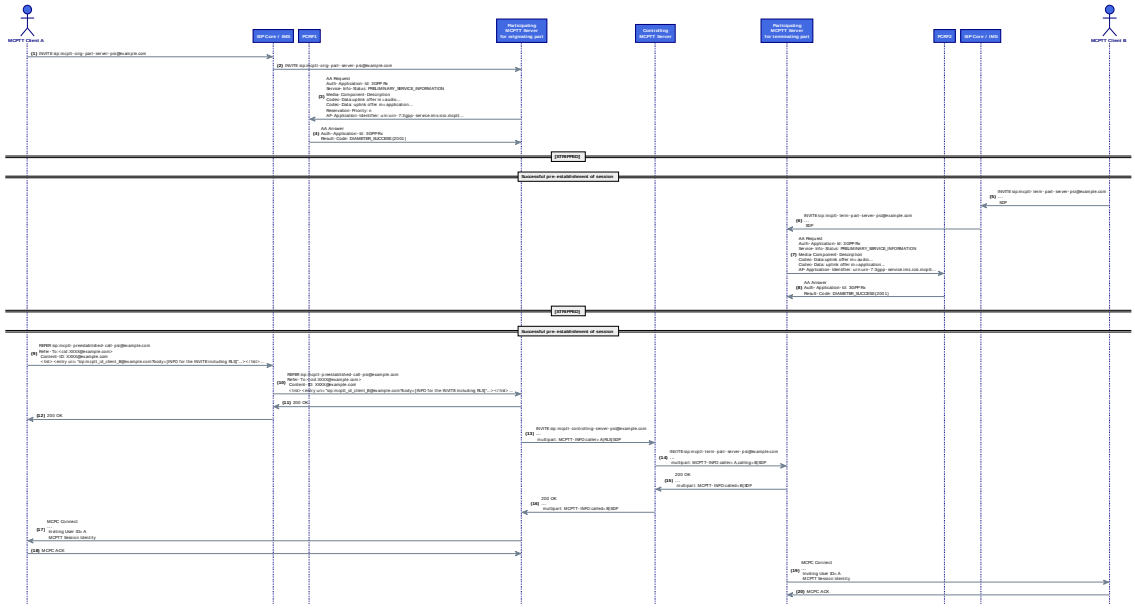

Figure 74: PCC/BEARERSETUP/04 (option a) Message Sequence

Interoperability Test Description

Table 83: PCC/BEARERSETUP/04 ITD

Interoperability Test Description	
Identifier	PCC/BEARERSETUP/04
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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])
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 6.7) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.8) • IMS_RX (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, procedure repeated for both ends
	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 User1
	4	check	The participating signals via DIAMETER the QoS requirement to the PCRF
	5	check	Sessions pre-established
	6	stimulus	User 1 calls User 2 using pre-established session
	7	check	REFER is created and sent to the participating server of User 1
	8	check	The participating server creates the proper INVITE with the data embedded in the REFER and forwards it to the controlling
	9	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
	10	check	The participating of the callee notifies him/her by sending an MCPC Connect message (reINVITE in manual or emergency/imminent peril calls)
	11	check	An MCPC Connect message is triggered by the originating participating servers
	12	verify	Call connected using the pre-established unicast MC bearers in both originating and terminating sides and media flows exchanged

Message Sequence Diagram

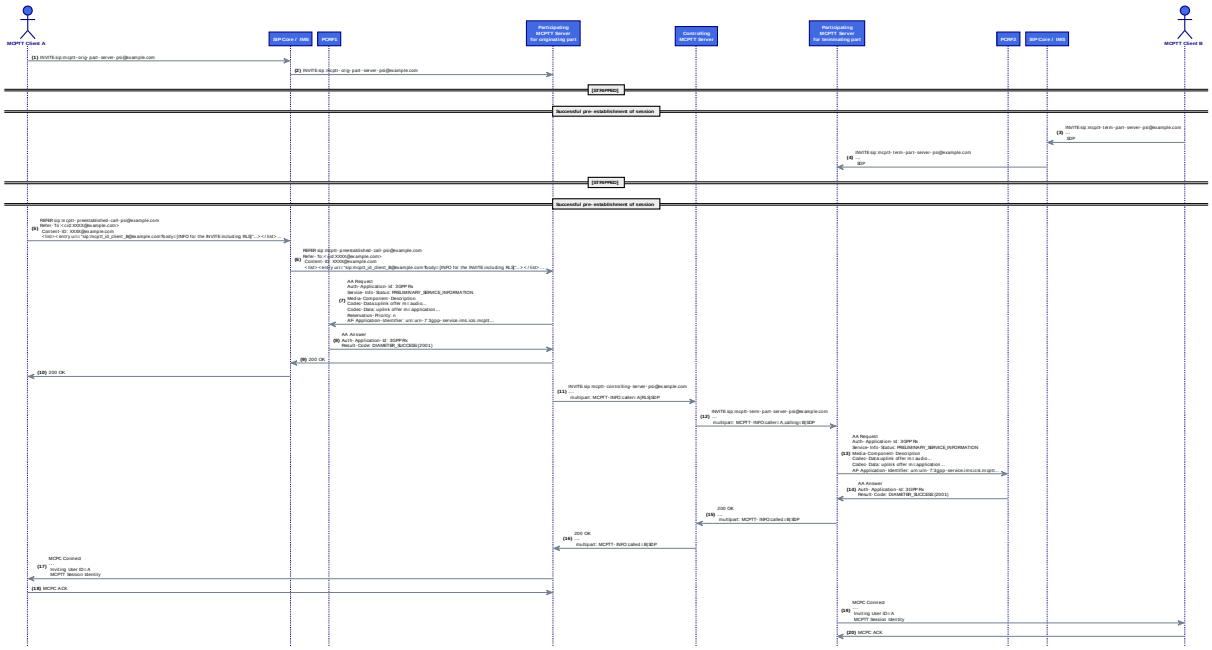

Figure 75: PCC/BEARERSETUP/04 (option b) Message Sequence

Table 84: PCC/BEARERSETUP/04 ITD

Interoperability Test Description			
Identifier	PCC/BEARERSETUP/04		
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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 6.7) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL (clause 6.8) • IMS_RX (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, procedure repeated for both ends
	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 P-CSCF would be able to parse the REFER and signal via DIAMETER the QoS requirement to the PCRF
	7	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
	8	check	The participating of the callee notifies him/her by sending an MCPC Connect message (reINVITE in manual or emergency/imminent peril calls)
	9	check	An MCPC Connect message is triggered by the originating participating servers
	10	verify	Call connected using the pre-established unicast MC bearers in both originating and terminating sides and media flows exchanged

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 [23]. 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 [23]. 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 [9] 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 [9]. 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. 14.2.1) of ETSI TS 124 380 [10] the term MCMC is used. However the old notation is kept in the present document to respect the alignment with the 14.1.0 version.

Message Sequence Diagram

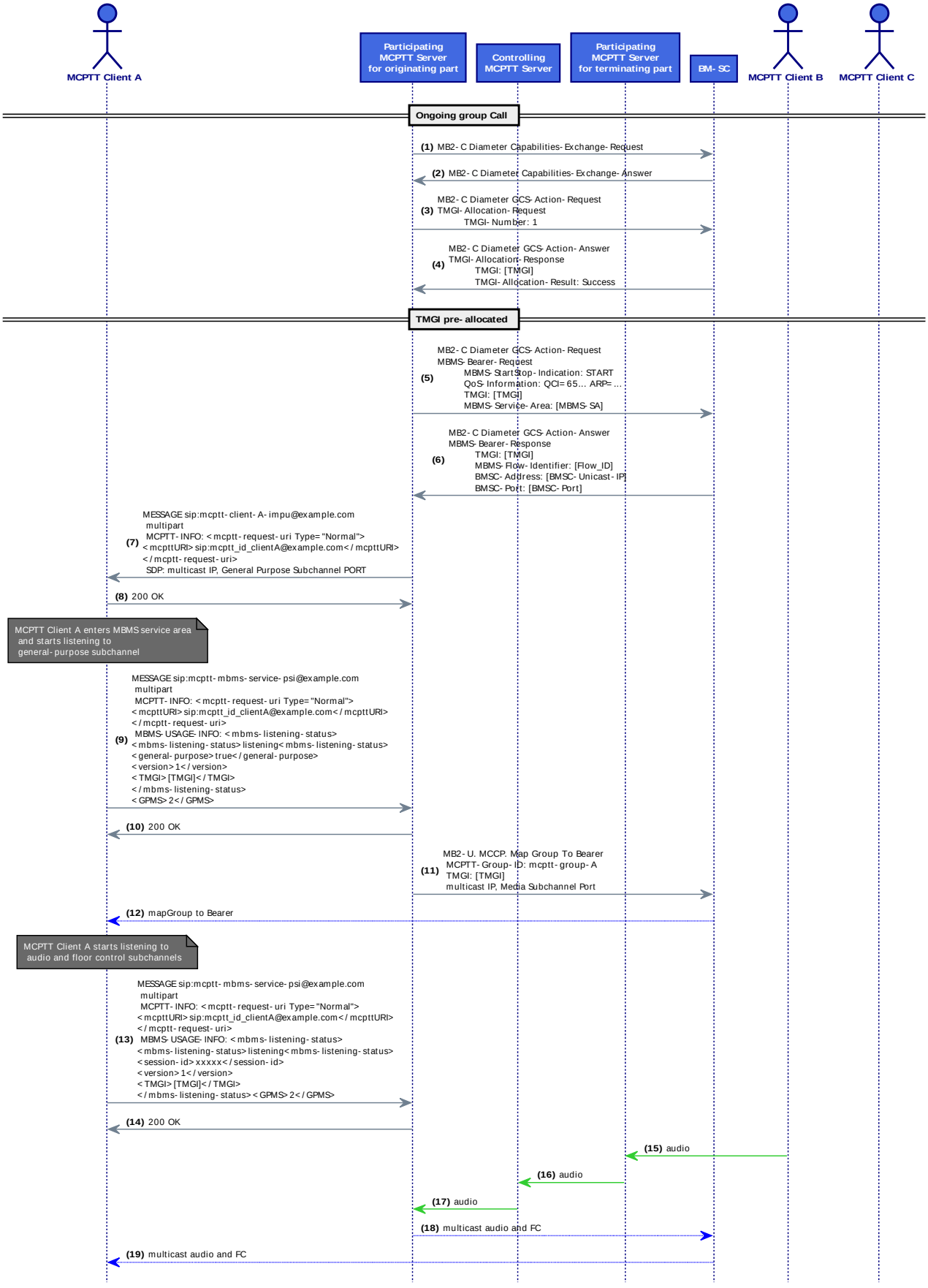

Figure 76: EMBMS/ACTIVATEBEARER/WPRETMGI/01 Message Sequence

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 85: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9]) • Diameter in MB2-C (see ETSI TS 129 468 [23])		
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

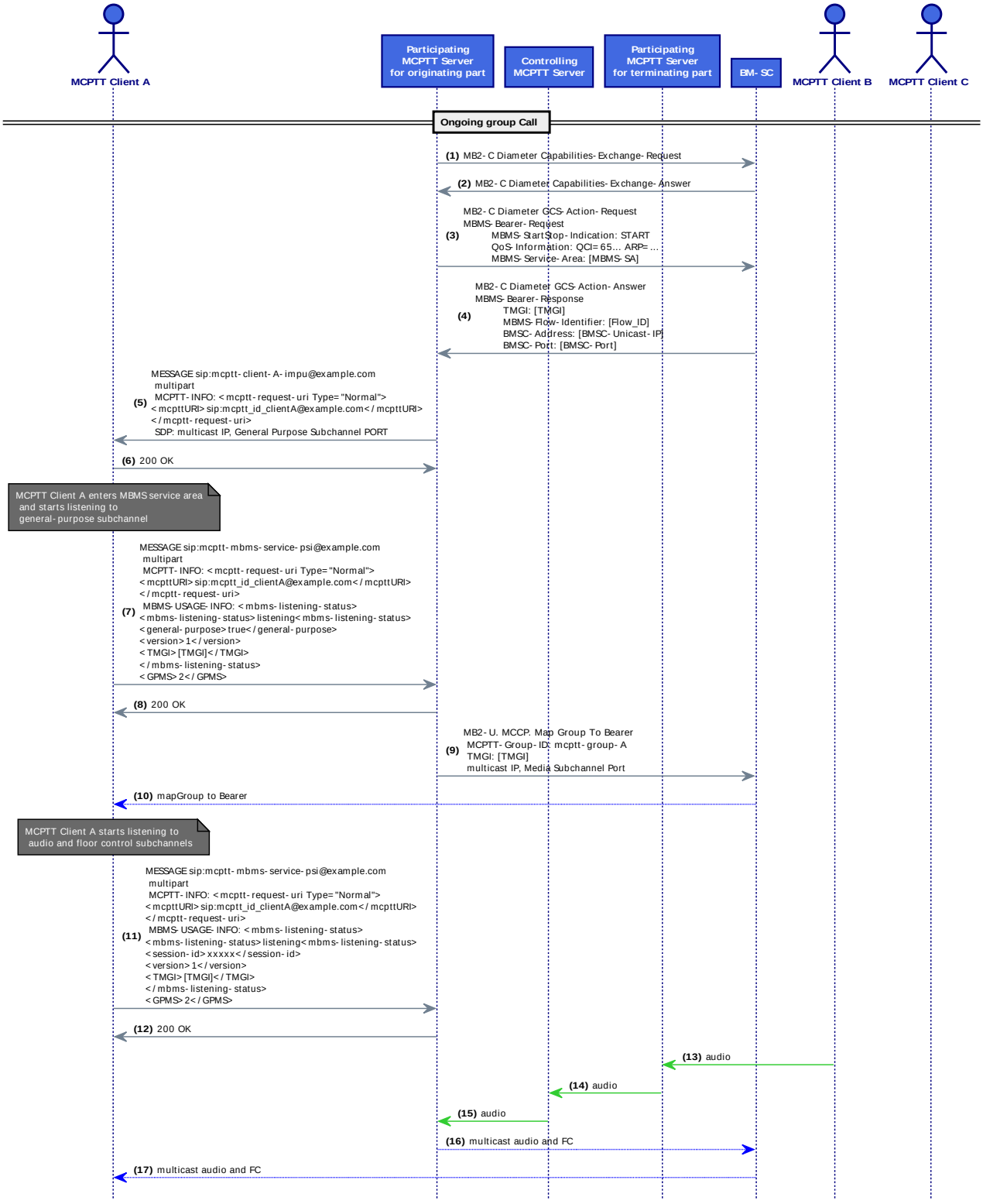

Figure 77: EMBMS/ACTIVATEBEARER/WOPRETMGI/01 Message Sequence

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 86: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9]) • Diameter in MB2-C (see ETSI TS 129 468 [23])		
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 123 379 [4], 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

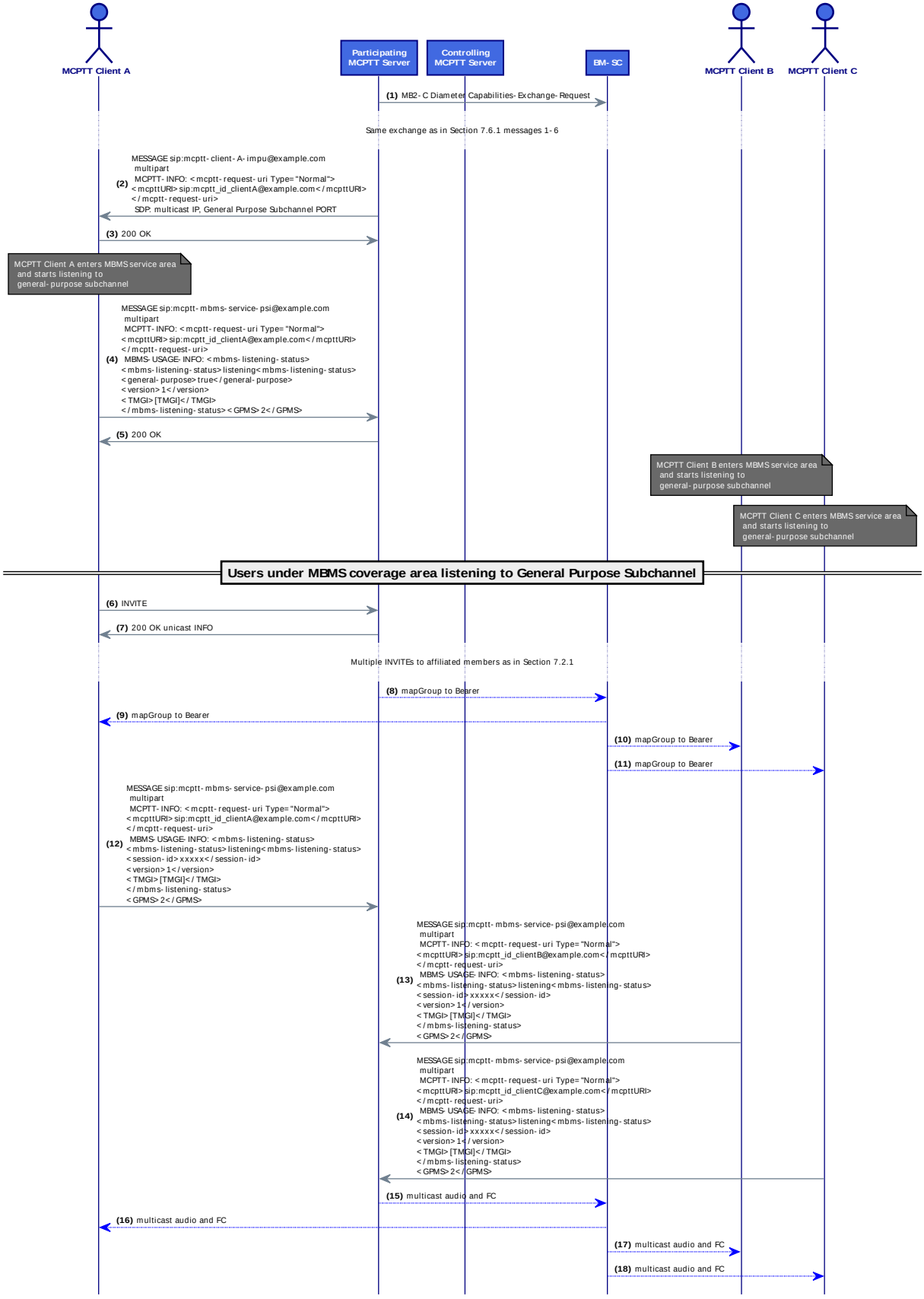

Figure 78: EMBMS/PREBEARER/WPRETMGI/01 Message Sequence

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 87: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9]) • Diameter in MB2-C (see ETSI TS 129 468 [23])		
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 123 379 [4], 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

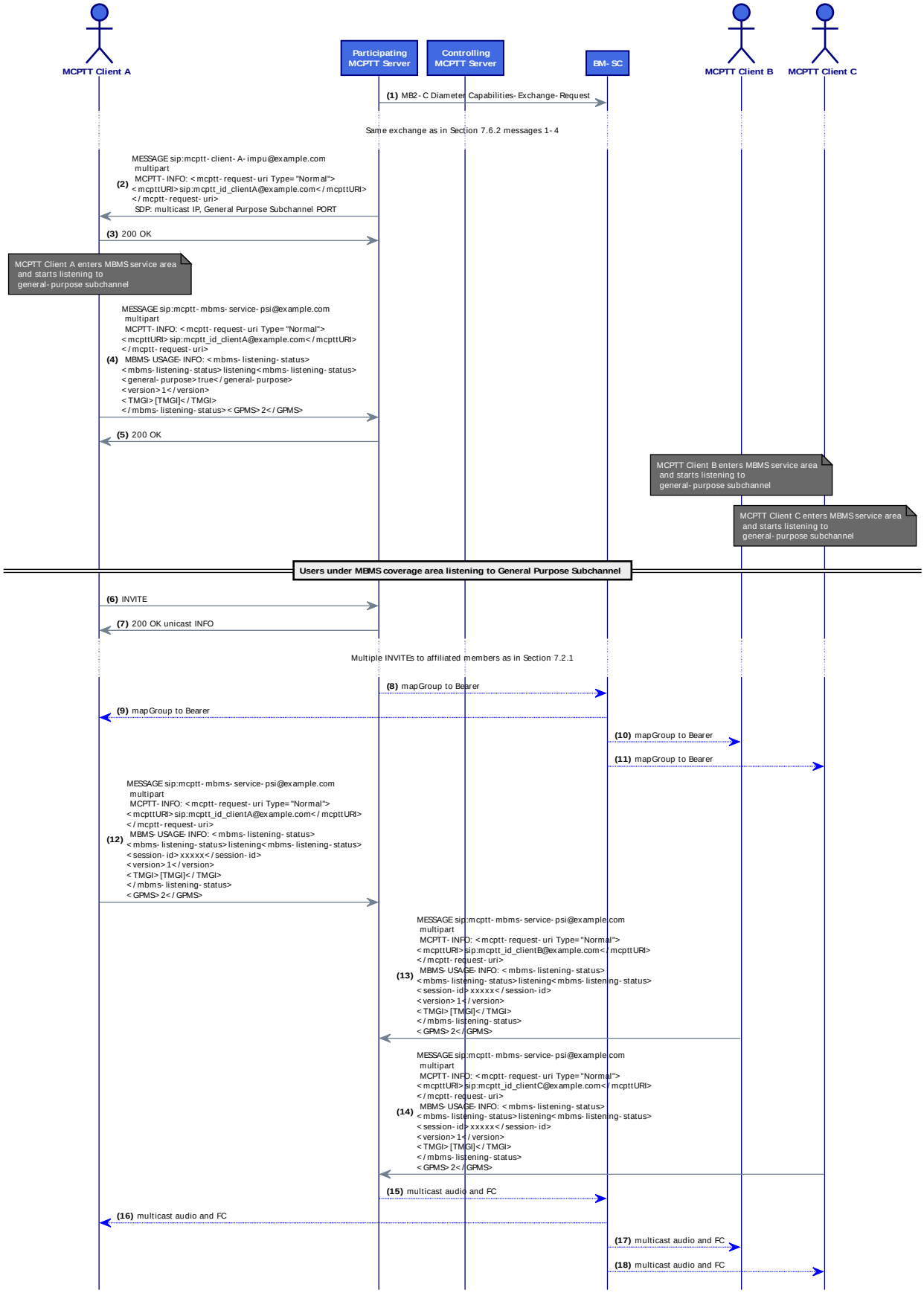

Figure 79: EMBMS/PREBEARER/WOPRETMGI/01 Message Sequence

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 88: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9]) • Diameter in MB2-C (see ETSI TS 129 468 [23])		
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 [23]. 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

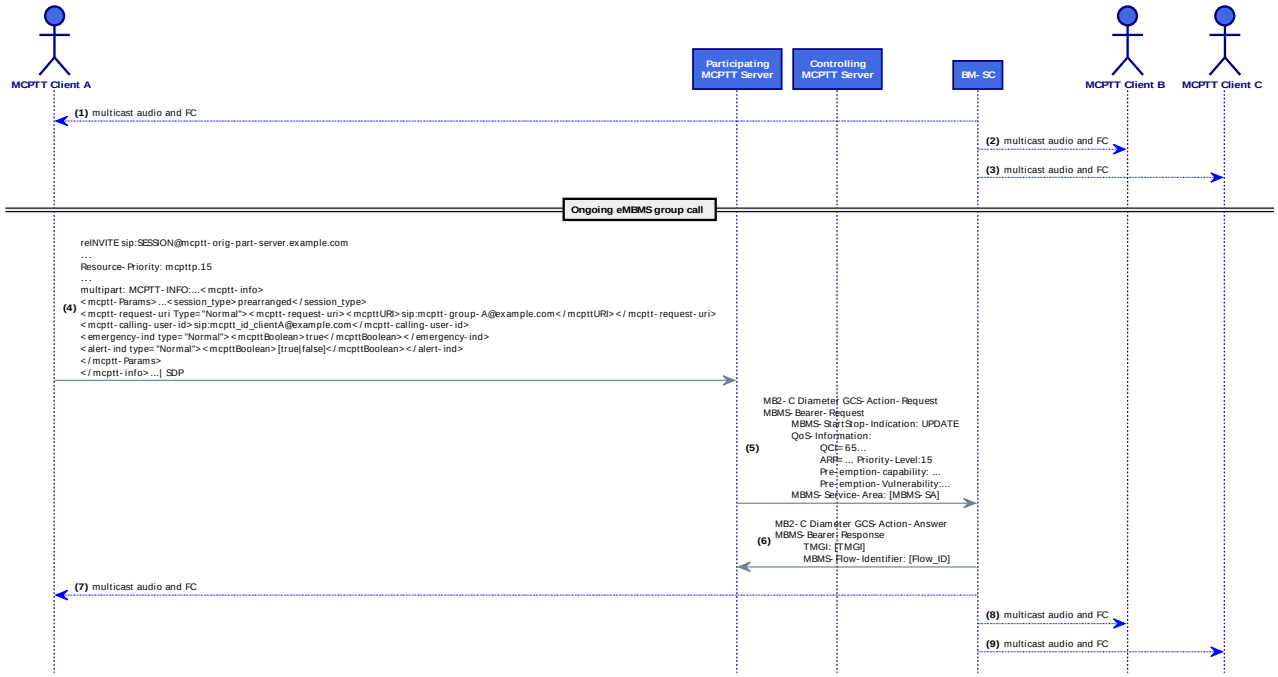

Figure 80: EMBMS/MODIFYBEARER/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 89: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9]) • Diameter in MB2-C (see ETSI TS 129 468 [23])		
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 [23]. 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 [23]. It shall send another GCS-Action-Request with a TMGI-Deallocation-Request AVP, which includes the TMGI to be deallocated.

Message Sequence Diagram

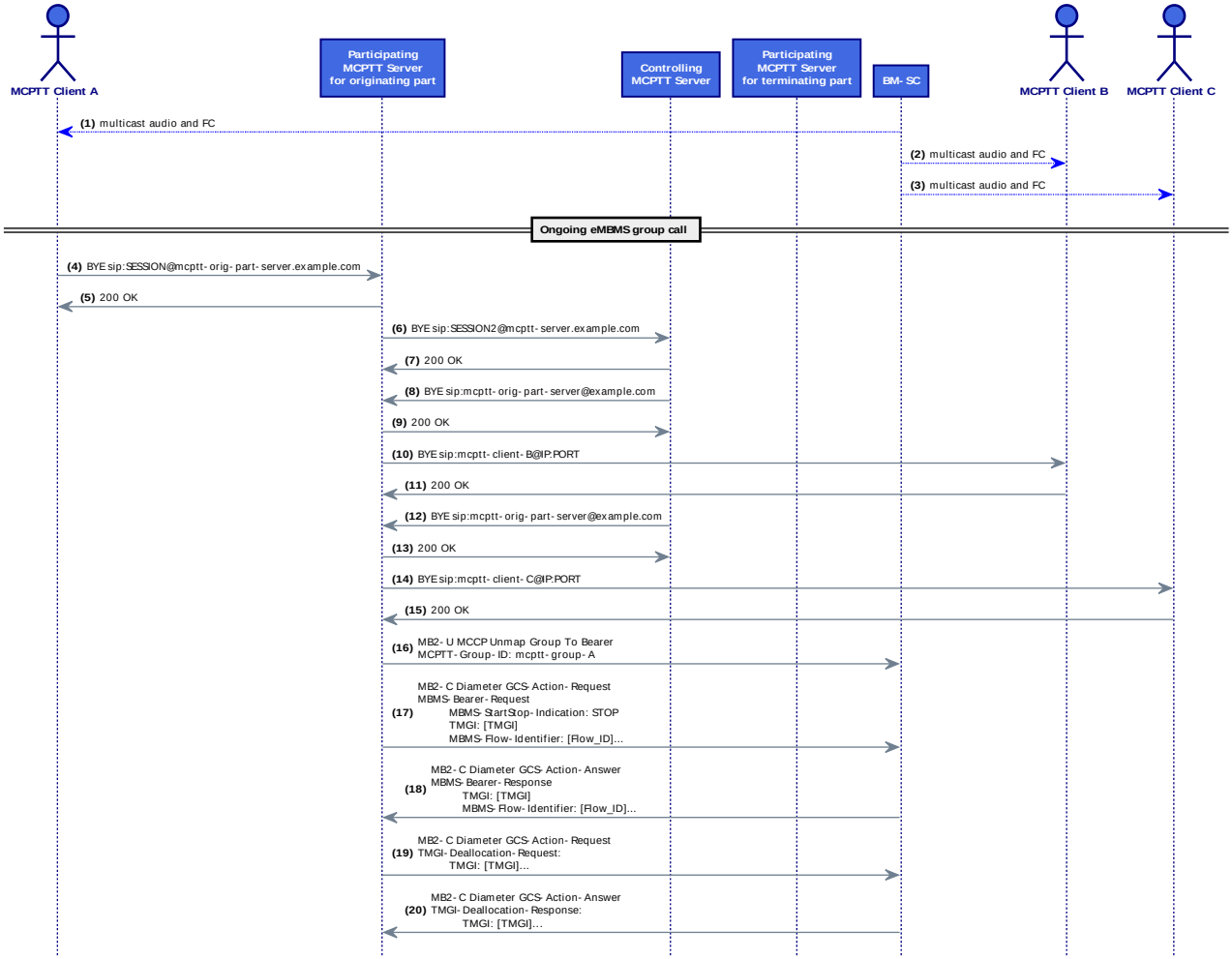

Figure 81: EMBMS/DEACTBEARER/WTMGIDEA/01 Message Sequence

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 90: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9]) • Diameter in MB2-C (see ETSI TS 129 468 [23])		
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

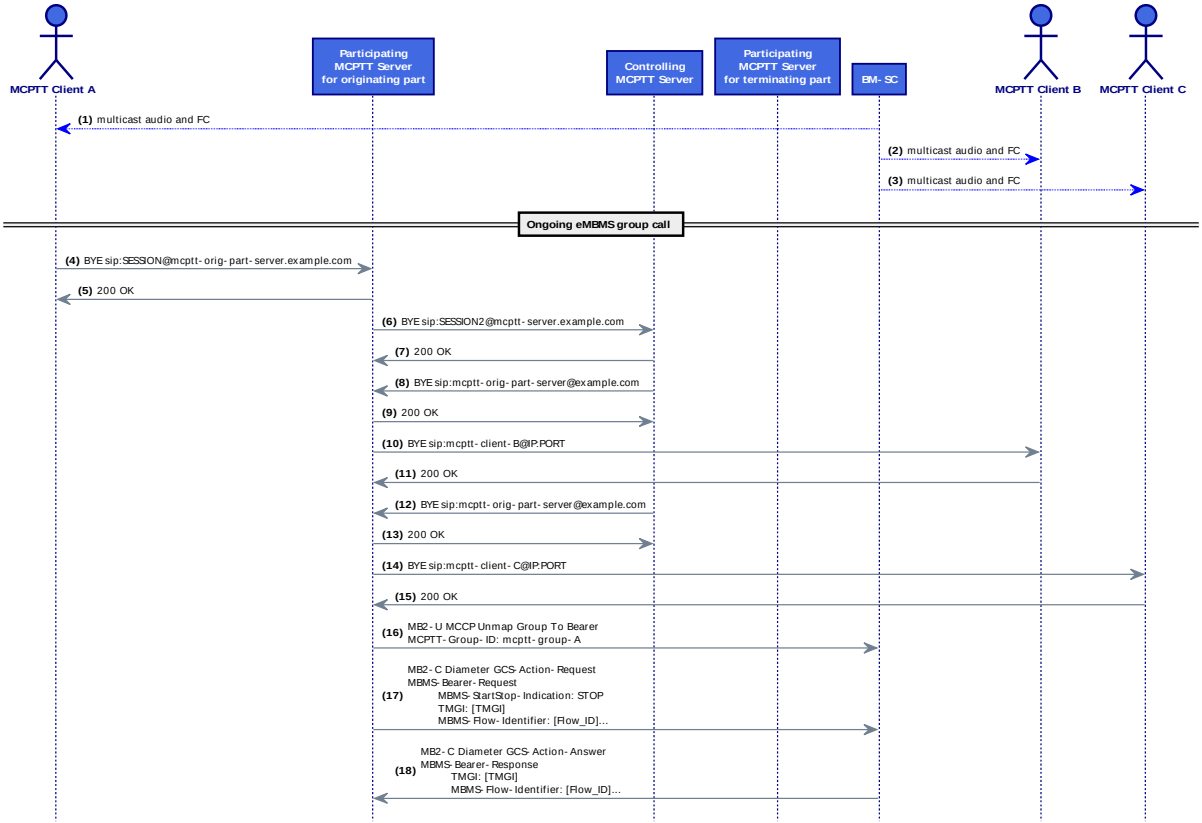

Figure 82: EMBMS/DEACTBEARER/WOTMGIDEA/01 Message Sequence

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 91: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9]) • Diameter in MB2-C (see ETSI TS 129 468 [23])		
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 [23].

Message Sequence Diagram

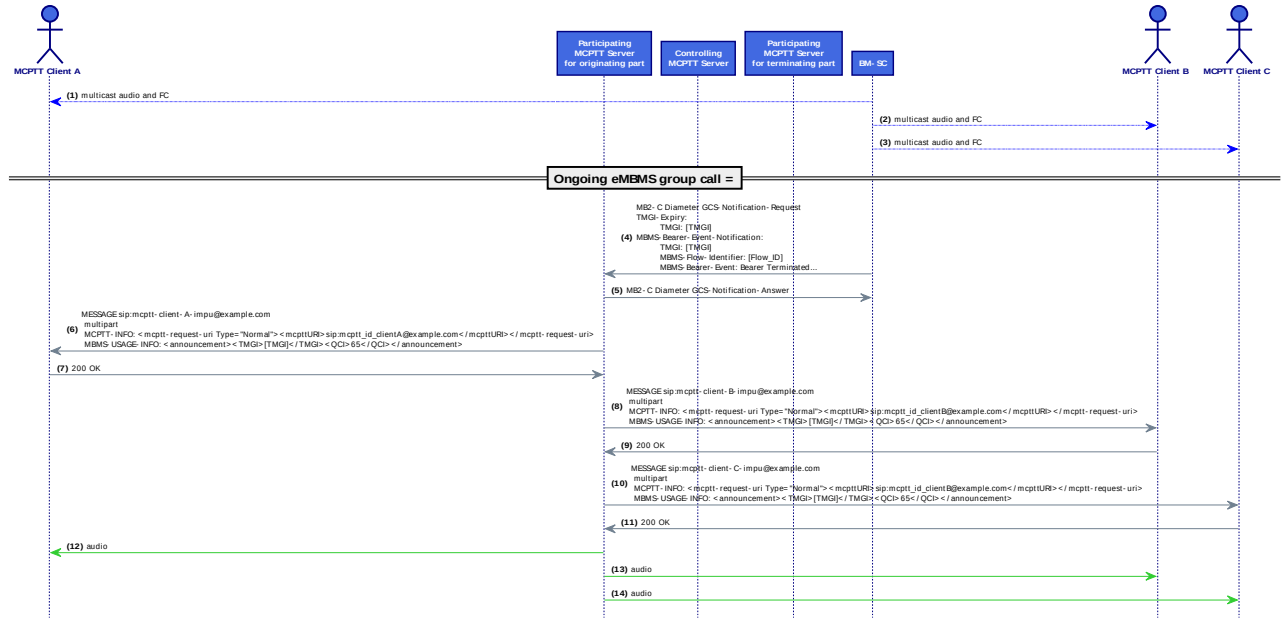

Figure 83: EMBMS/SWITCHTOUNITMGIEXP/01 Message Sequence

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 92: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9]) • Diameter in MB2-C (see ETSI TS 129 468 [23])		
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 [9]. 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 [6], IETF RFC 3856 [26], and IETF RFC 6665 [34] containing an application/pidf+xml MIME body indicating per-user affiliation information.

Message Sequence Diagram

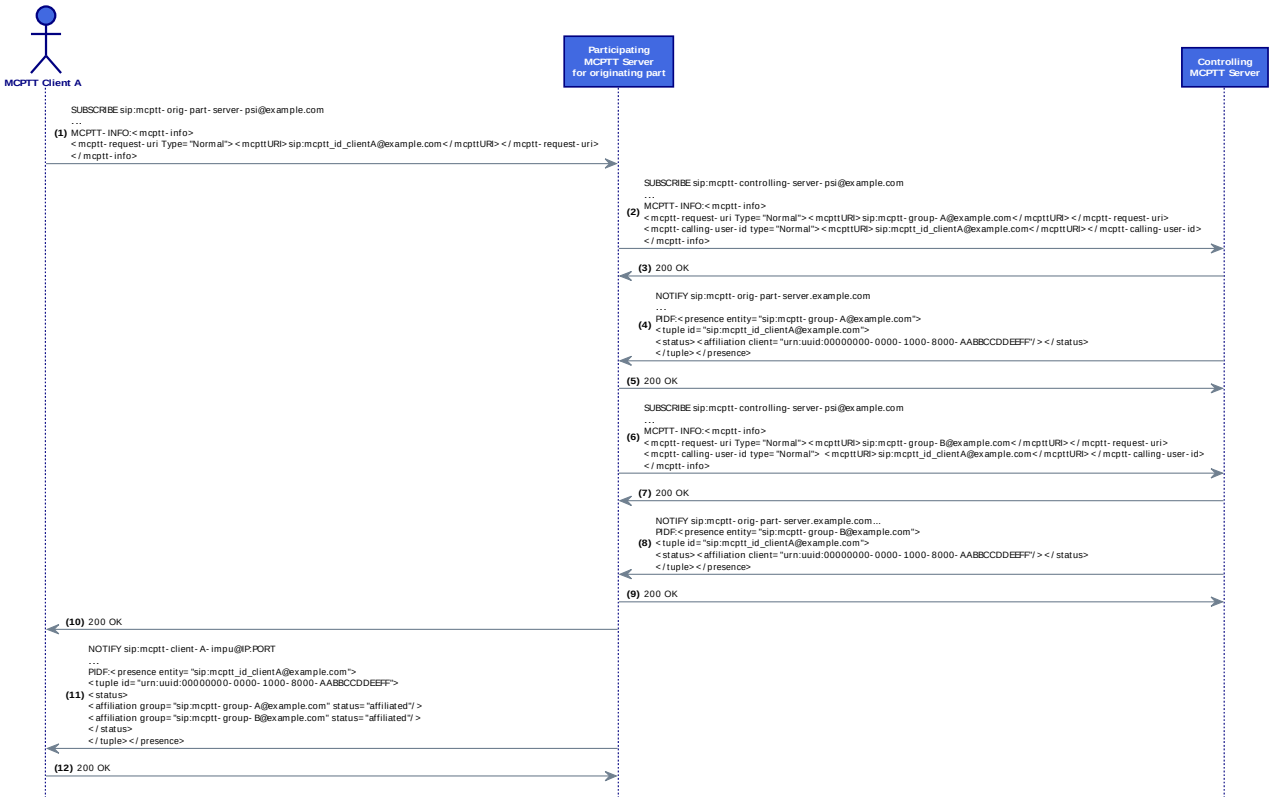

Figure 84: AFFIL/DET/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 93: 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 [6] and other references in ETSI TS 124 379 [9])		
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

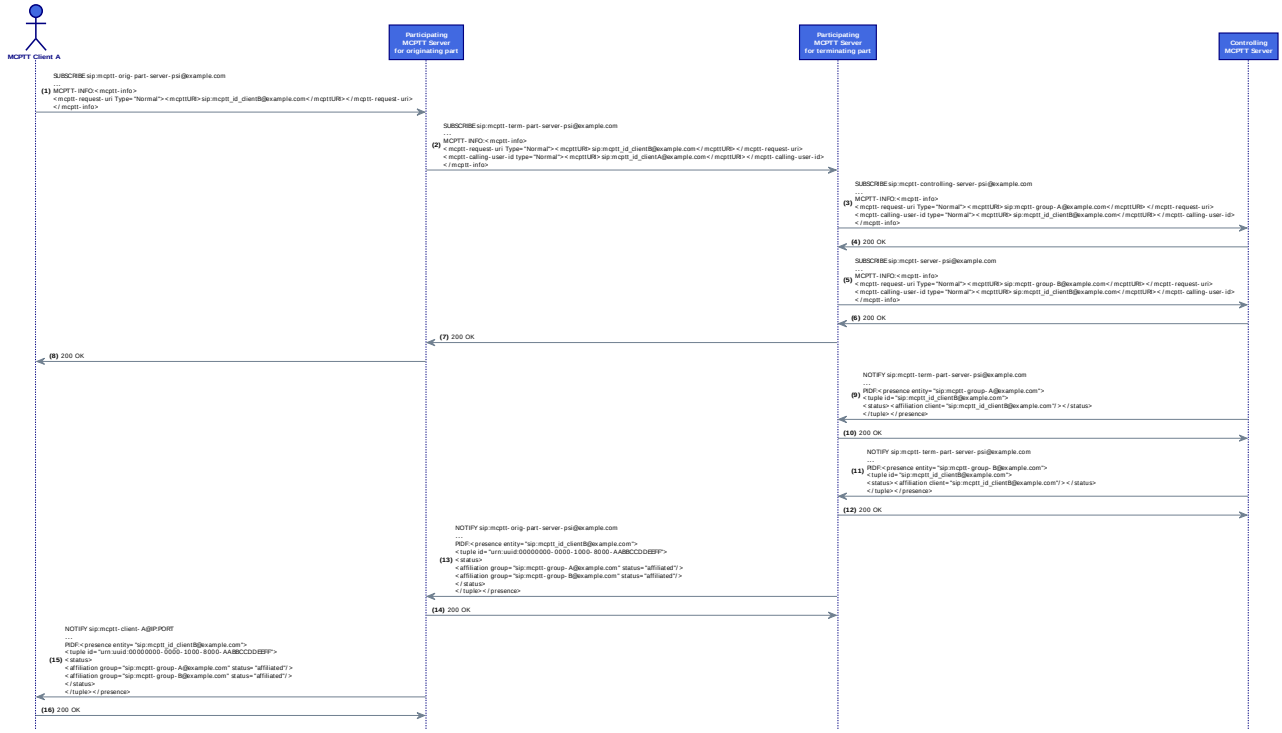

Figure 85: AFFIL/DET/02 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 94: 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 [6] and other references in ETSI TS 124 379 [9])		
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 [9]).

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 [27]: 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

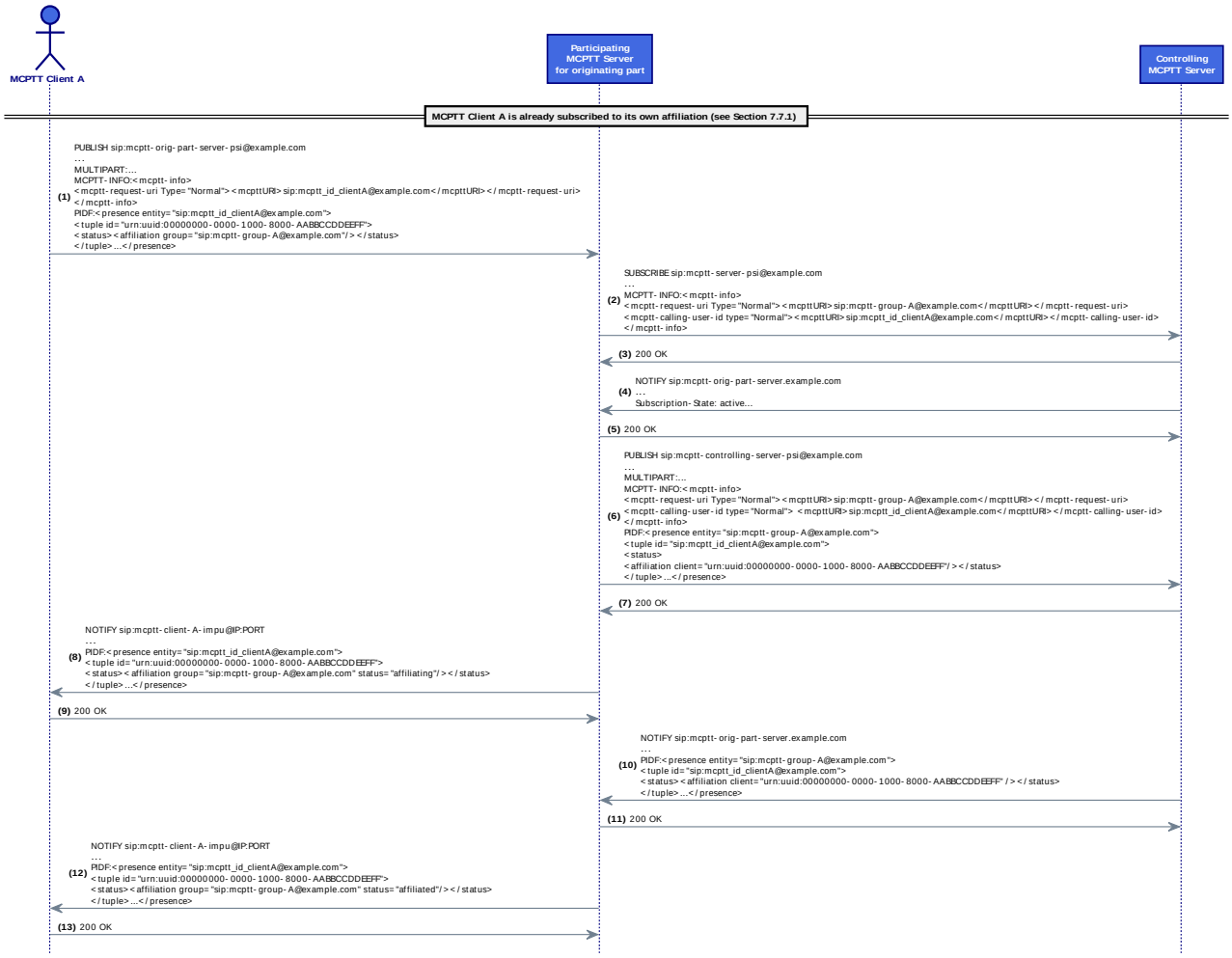

Figure 86: AFFIL/CHANGE/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 95: 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 [6] and other references in ETSI TS 124 379 [9])		
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

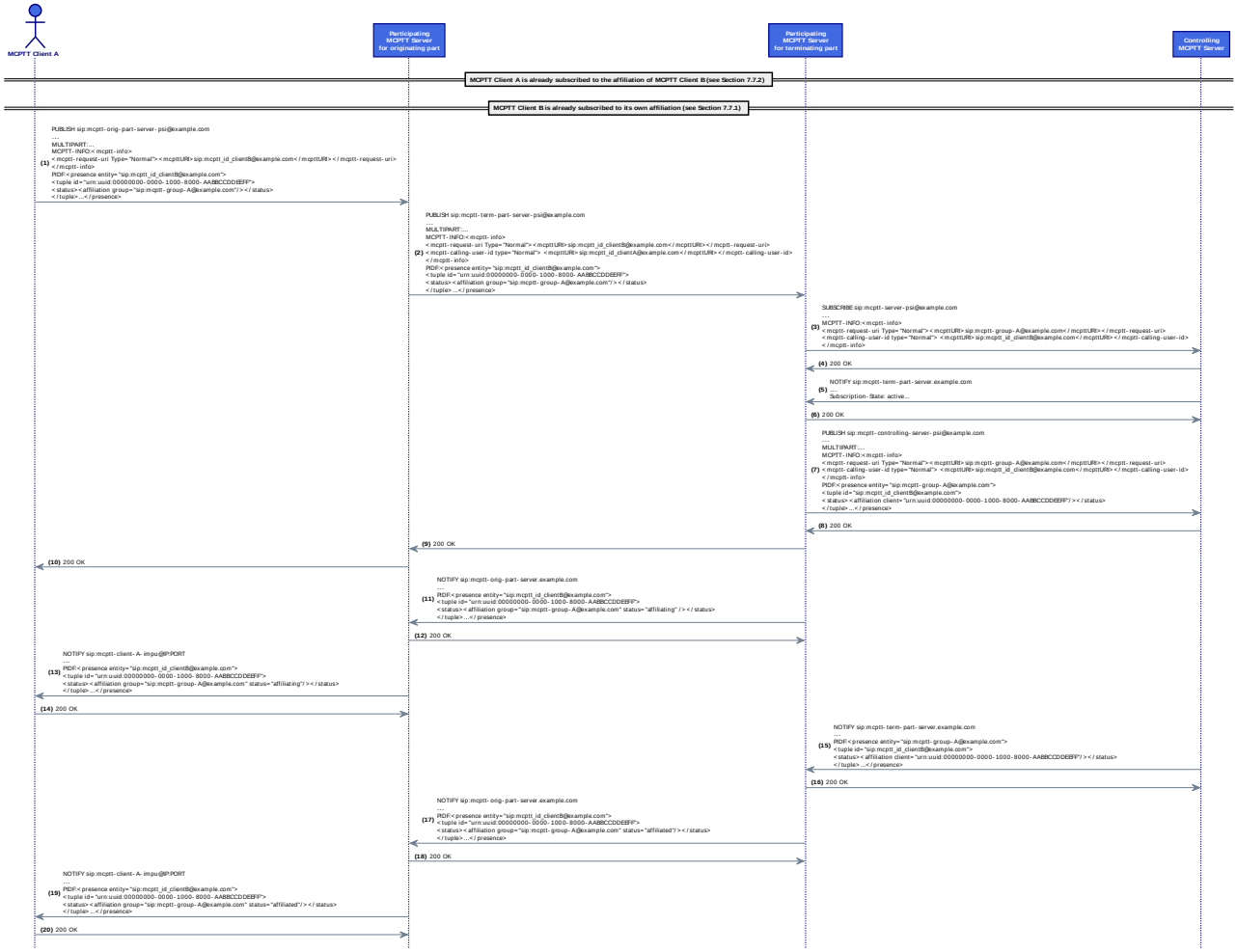

Figure 87: AFFIL/CHANGE/02 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table96: 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 [6] and other references in ETSI TS 124 379 [9])		
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

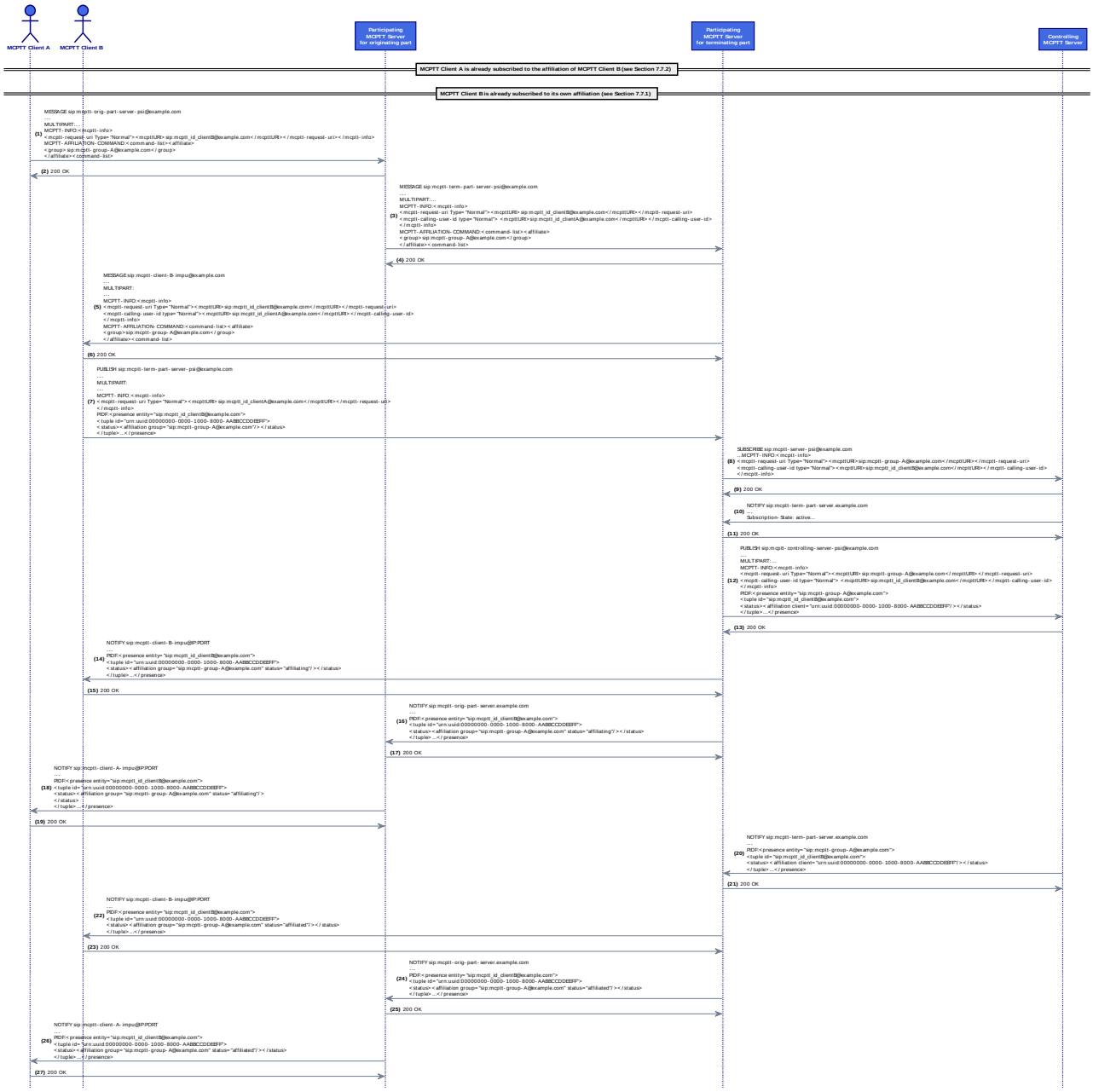

Figure 88: AFFIL/CHANGE/03 Message Sequence

Message Details

`Trace Pending`

Interoperability Test Description

Table 97: 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 [6] and other references in ETSI TS 124 379 [9])		
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 [9].

Message Sequence Diagram

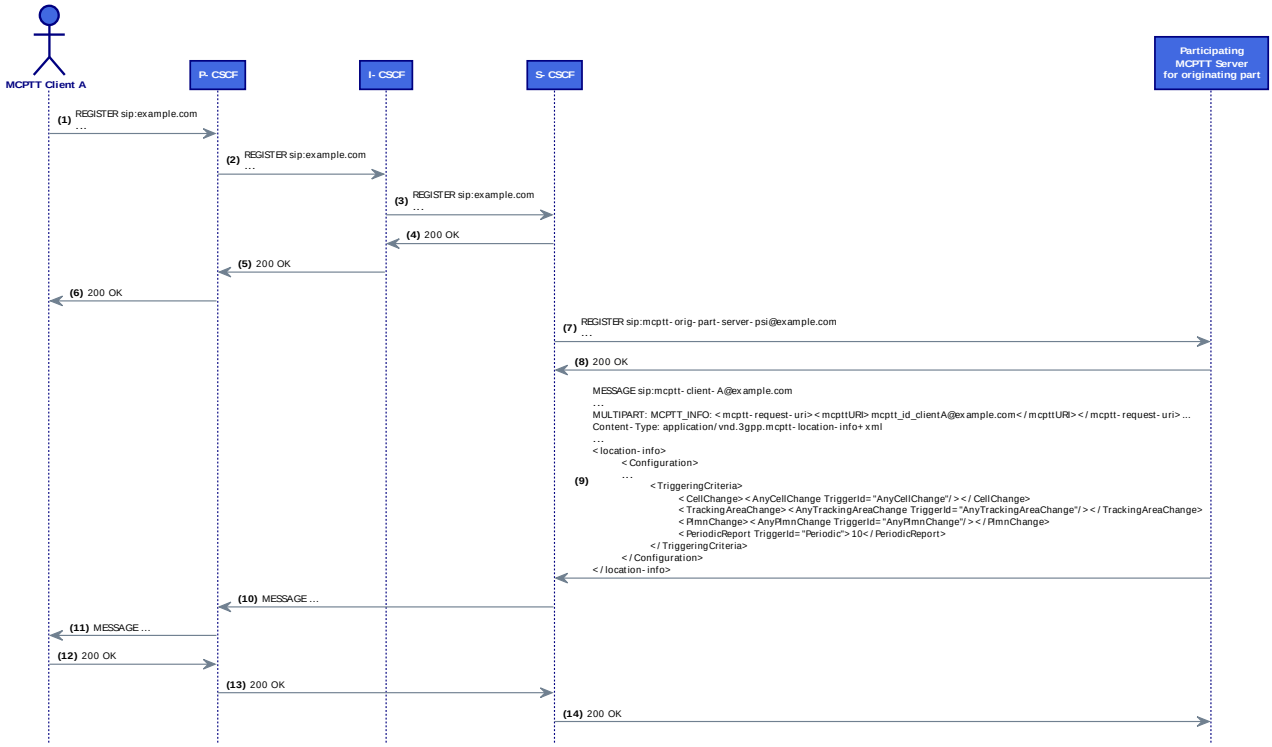

Figure 89: LOC/3PRTYREG/CONFIG/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 98: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 [9]. Upon its reception, the MCPTT Client shall send a location report as specified in clause 13.3.4 in ETSI TS 124 379 [9] and reset the reporting timer.

Message Sequence Diagram

Figure 90: LOC/REQUEST/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 99: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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 [9].

Message Sequence Diagram

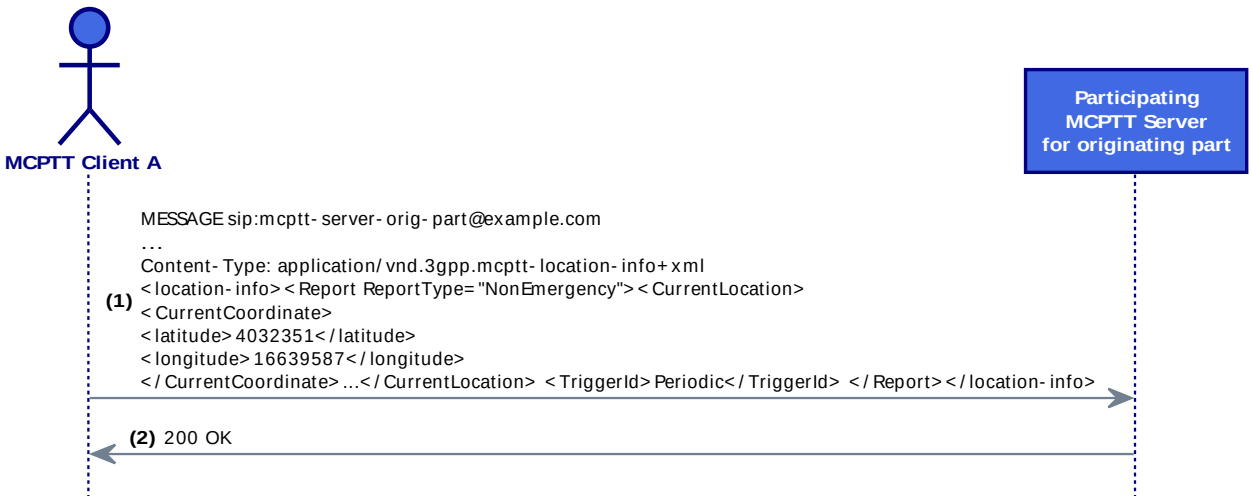

Figure 91: LOC/SUBMISSION/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table100: 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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
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

7.9 OAM procedures (CSC)

7.9.0 General

ETSI TS 124 484 [14] defines the mechanism for online and offline configuration. Since the offline configuration specific mechanism is out of scope of 3GPP in the 2nd Plugtests online mechanisms online will be considered. Although there are several OMA XDM based document operations defined, those ones that are crucial to support MCS configuration have been selected. Regarding the management of updates again the most basic case has been addressed.

According to [14] the MC UE, using the identities obtained during MC user authentication, subscribes to different CSC documents. If these documents have been updated since the current version stored in the MC UE, then the MC UE will receive a SIP NOTIFY request with an XCAP Diff document (see IETF RFC 5875 [32]), in which case the CMC updates its local document copies.

Unless otherwise specified, MCPTT documents only (not MCData or MCVideo) have been considered for this 2nd Plugtests for simplicity purposes. Note that in the diagrams MCS (instead of MCPTT) term is used to allow future extensions to other services. Finally, in this 2nd Plugtests the "document retrieval" operations only have been considered. Creation, update and delete operations will be considered in future Plugtests.

7.9.1 Subscription and UE configuration document retrieval from the MC UE [CSC-CMS/UECONF/UE/01]

As aforementioned, in order to obtain access to MC services the MC UE needs to obtain configuration data either online via the network or offline. The mechanism to discover the online or offline configuration management server is dependent on the protocol used to manage and configure the MO and is out of scope of ETSI TS 124 484 [14] or any other TS. In this test case document will assume the online mechanism is used.

Note that in clause 6.3.13.2.2 in ETSI TS 124 484 [14] two working modes are considered:

- Direct subscription
- Subscription to multiple documents simultaneously using the subscription proxy function

For the 2nd Plugtests, in clauses 7.9.1, 7.9.2 and 7.9.3 the direct subscription is considered while clause 7.9.7 considers the subscription to multiple CMS and GMS documents using the subscription proxy function. Note that direct subscription is the only mechanism considered for the MCS server, so that test cases in clauses 7.9.4 and 7.9.6 use it.

NOTE: Due to several inconsistencies and interpretation of the direct subscription mechanism in 3GPP's TS the participants of the 2nd MCPTT Plugtests agreed NOT to test direct subscription and use subscription proxy instead. The test cases are however still included here for future references. UE configuration document retrieval in direct subscription mode (together with the overall UE bootstrapping mechanism defined in clause 4.2.1 in ETSI TS 124 484 [14]) comprises sending a SIP SUBSCRIBE following the procedures in clause 6.3.13.2.2 (subclause a) in [14], using the base URI of CMSXCAPRootURI as Request URI, later handling it (by CMS server) following clause 6.3.13.3.2.3 behaving as a notifier as in IETF RFC 5875 [32]. In the NOTIFY the URLs of the document to be retrieved and ETAGs will be provided to the CMC (assuming simplest diff-processing "no-patching" mechanism). Later, the CMC in the UE will download and parse the ue-config document using the OMA-XDM procedures defined in [36].Message Sequence Diagram

Figure 92: CSC-CMS/UECONF/UE/01 Message Sequence

Message Details

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Trace Pending
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Interoperability Test Description

Table 101: CSC-CMS/UECONF/UE/01 ITD

Interoperability Test Description			
Identifier	CSC-CMS/UECONF/UE/01		
Test Objective	Verify IP connectivity, proper access from the MCS Client to the CMS and retrieval and parsing of Release 14 XML		
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	• CMS access mechanism based on OMA XDM and SIP SUBSCRIBE/NOTIFY (see [14])		
Applicability	• MCPTT-Client_CMS, MCData-Client_CMS, MCVideo-Client_CMS		
Pre-test conditions	• IP connectivity among all elements of the specific scenario, access to the CSC servers via the proper APN • CMSXCAPRootURI offline provisioned		
Test Sequence	**Step**	**Type**	**Description**
	1	check	MCS Clients send a SIP SUBSCRIBE to the CMS using direct subscription and the proper auid
	2	check	CMS processes the SUBSCRIBE, behaves as notifier and returns the xcap-diff document with the URLs of the related document and ETAGs
	3	check	CMC in the MCS client parses the xcap-diff document and identifies the -new/updated- ue-config document URL
	4	check	The CMC in the MCS clients sends a HTTP GET request to the ue-config URL using OMA XDM procedures
	5	check	CMC downloads correctly the ue-config document and parses it
	6	verify	MCS client correctly configured according to the new/updated-document

7.9.2 Subscription and user profile configuration document retrieval from the MC UE [CSCCMS/UPROCONF/UE/01]

The mechanism is equivalent to that in clause 7.9.1 but using the direct subscription mechanism for the user profile document (clause 8.3 in [14]. As shown in the diagram the AUID and XUI would be then different. Note that MCPTT user profile documents are "XDM collections" in the user's directory in the "Users Tree", in accordance with [36].

Additionally, since direct subscription is considered and no user authentication/service authorization would be in place yet this test case, it would only be applicable for the bootstrapping procedure with a default user considered in clause 4.2.2.1 in [14]: "If the MCS UE initial configuration MO contains a <default-user-profile> element and the identified default MCS user profile configuration MO(s) have changed from the version stored in the MC UE, the updated default MCS user profile configuration MO(s) are downloaded to the MC UE". As a consequence, at least one instance of an MCS user profile configuration document needs to first be created on the configuration management server, containing the "XUI-URI" attribute and "user-profile-index" attribute (as defined in clause 8.3.2.1 in [14]) that are included in the <Default-user-profile> element.

NOTE: According to [14] the default MCS user profile configuration MO(s) define the default identity(s) for the enabled mission critical service(s) and the profile of services available to the user (e.g. emergency MCPTT services) prior to user authentication (see note in clause 7.9.1).

Message Sequence Diagram

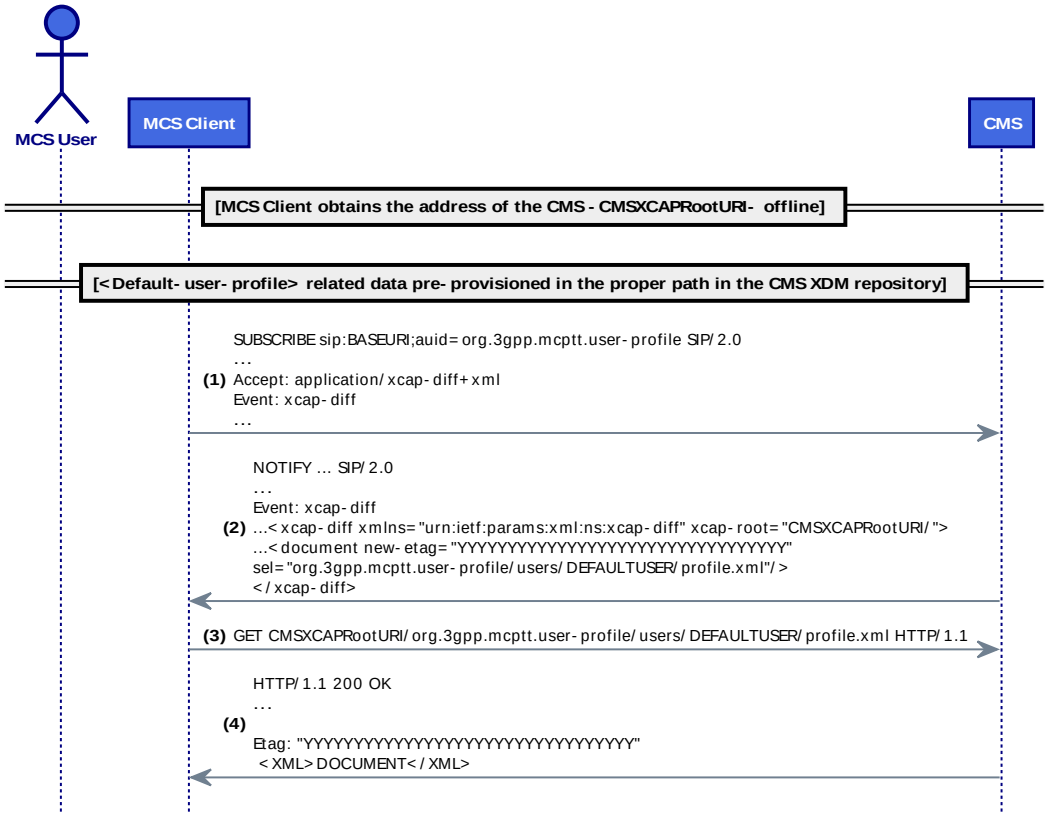

Figure 93: CSC-CMS/UPROCONF/UE/01 Message Sequence

Message Details

`Trace Pending`

Interoperability Test Description

Table 102: CSC-CMS/UPROCONF/UE/01 ITD

	Interoperability Test Description
Identifier	CSC-CMS/UPROCONF/UE/01
Test Objective	Verify IP connectivity, proper access from the MCS Client to the CMS and retrieval and parsing of Release 14 XML
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	• CMS access mechanism based on OMA XDM and SIP SUB- • SCRIBE/NOTIFY (see [14])
Applicability	• MCPTT-Client_CMS, MCData-Client_CMS, MCVideo-Client_CMS
Pre-test conditions	• IP connectivity among all elements of the specific scenario, access to the CSC servers via the proper APN
Pre-test conditions	• CMSXCAPRootURI offline provisioned and <Default-user-profile> related data pre-provisioned in the proper path in the CMS XDM repository

Test Sequence	Step	Type	Description
	1	check	MCS Client sends a SIP SUBSCRIBE to the CMS using direct subscription and the proper AUID
	2	check	CMS processes the SUBSCRIBE, behaves as notifier and returns the xcap-diff document with the URL of the related document and ETAGs
	3	check	CMC in the MCS client parses the xcap-diff document and identifies the -new/updated- user profile document URL
	4	check	The CMC in the MCS clients sends a HTTP GET request to the user-profile of the default user's URL using OMA XDM procedures
	5	check	CMC downloads correctly the user profile document and parses it
	6	verify	MCS client correctly configured according to the new/updated-document valid till later MCPTT authentication is completed

7.9.3 Subscription and service configuration document retrieval from the MC UE [CSCCMS/SERVCONF/UE/01]

The test case is equivalent to that described in clause 7.9.1 with direct subscription using the service configuration document as described in clause 8.4 in ETSI TS 124 484 [14] (see note in clause 7.9.1).

Message Sequence Diagram

Figure 94: CSC-CMS/SERVCONF/UE/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 103: CSC-CMS/SERVCONF/UE/01 ITD

Interoperability Test Description			
Identifier	CSC-CMS/SERVCONF/UE/01		
Test Objective	Verify IP connectivity, proper access from the MCS Client to the CMS and retrieval and parsing of Release 14 XML		
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	• CMS access mechanism based on OMA XDM and SIP SUBSCRIBE/NOTIFY (see [14])		
Applicability	• MCPTT-Client_CMS, MCData-Client_CMS, MCVideo-Client_CMS		
Pre-test conditions	• IP connectivity among all elements of the specific scenario, access to the CSC servers via the proper APN		
Pre-test conditions	• CMSXCAPRootURI offline provisioned		
Test Sequence	**Step**	**Type**	**Description**
	1	check	MCS Client sends a SIP SUBSCRIBE to the CMS using direct subscription and the proper auid
	2	check	CMS processes the SUBSCRIBE, behaves as notifier and returns the xcap-diff document with the URLs of the related document and ETAGs
	3	check	CMC in the MCS client parses the xcap-diff document and identifies the -new/updated- service config document URL
	4	check	The CMC in the MCS clients sends a HTTP GET request to the ue-config URL using OMA XDM procedures
	5	check	CMC downloads correctly the service-config document and parses it
	6	verify	MCS client correctly configured according to the new/updated-document

7.9.4 Subscription and service configuration document retrieval from the MCS Server [CSCCMS/SERVCONF/MCSSERV/01]

The test case is equivalent to that described in clause 7.9.3 with direct subscription but from the MCS server clauses 6.3.13.2.3 and 6.3.13.3.2.4 in [14].

Note that the MCS server would subscribe to the MCS service configuration document for each mission critical organisation that is supported by the MCS server. How the MCS server is provisioned with the identities of the mission critical organisations is out of scope of 3GPP's TSs.

NOTE: Due to the issues of the direct subscription mechanism (see note in clause 7.9.1) in order to enable the needed testing, an alternative subscription proxy based approach has been proposed.

Message Sequence Diagram - DIRECT SUBSCRIPTION-

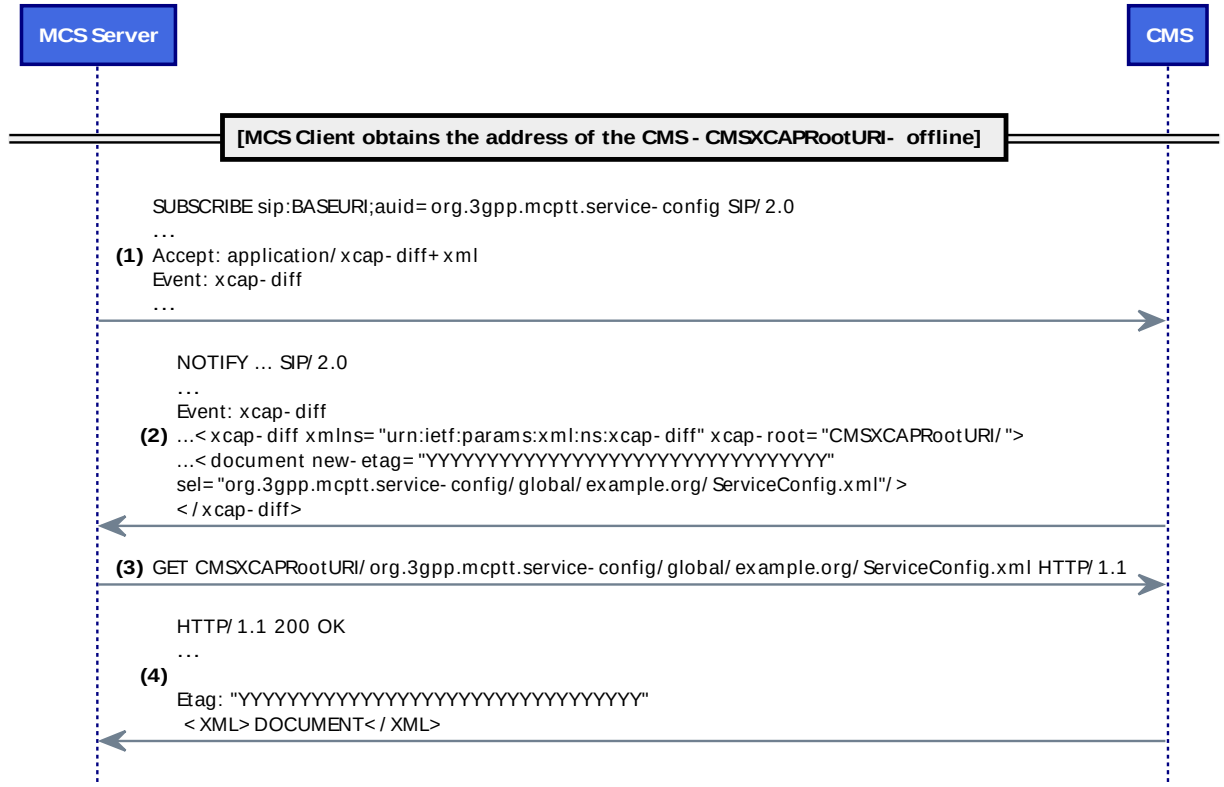

Figure 95: CSC-CMS/SERVCONF/MCSSERV/01 Message Sequence

Message Sequence Diagram - SUBSCRIPTION PROXY-

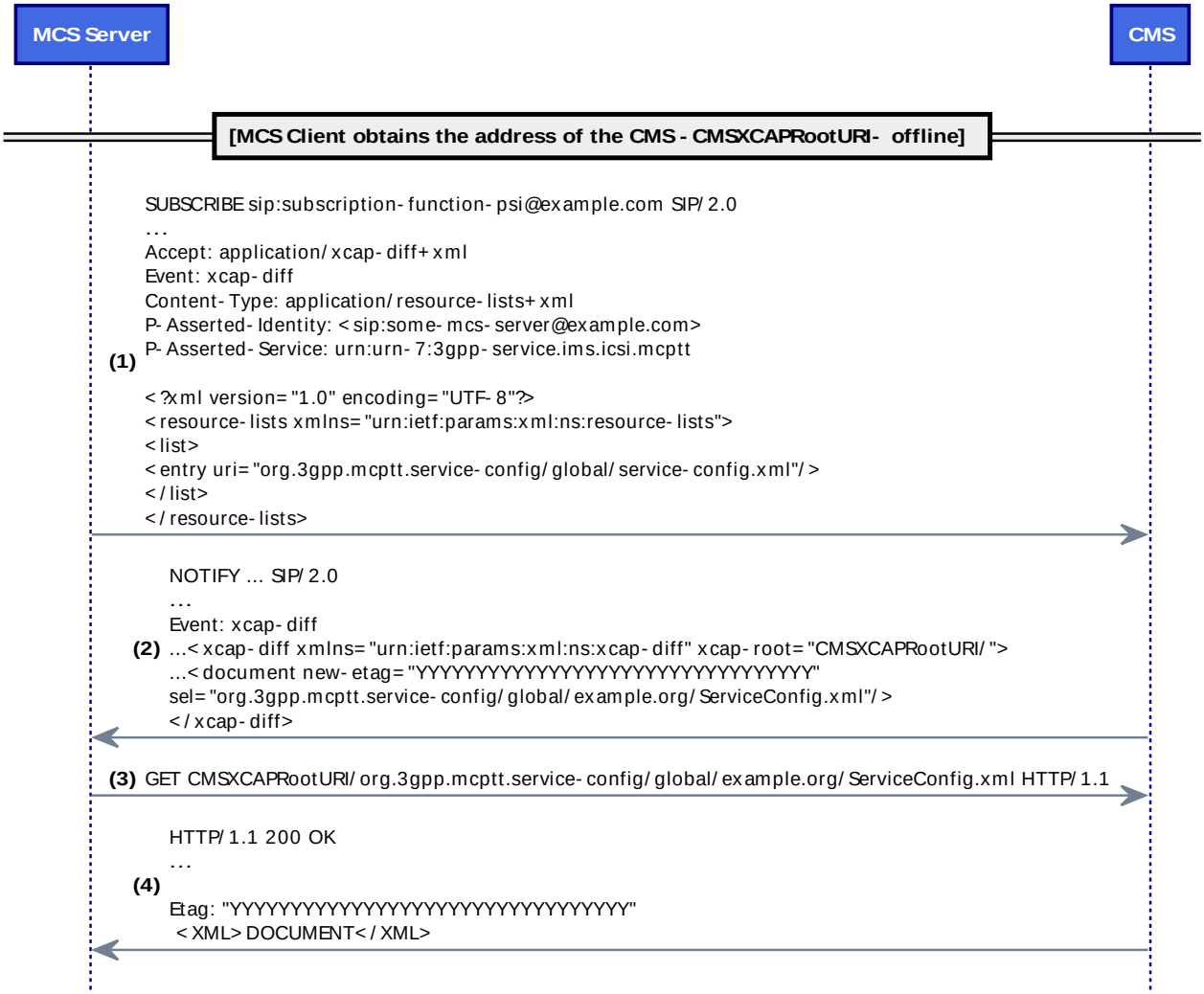

Figure 96: CSC-CMS/SERVCONF/MCSSERV/01-b Message Sequence

Message Details

Trace Pending

Table 104: CSC-CMS/SERVCONF/MCSSERV/01 ITD

Interoperability Test Description			
Identifier	CSC-CMS/SERVCONF/MCSSERV/01		
Test Objective	Verify IP connectivity, proper access from the MCS Server to the CMS and retrieval and parsing of Release 14 XML		
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	• CMS access mechanism based on OMA XDM and SIP SUBSCRIBE/NOTIFY (see ETSI TS 124 484 [14])		
Applicability	• MCPTT-Server_CMS, MCData-Server_CMS, MCVideo-Server_CMS		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • CMSXCAPRootURI offline provisioned		
Test Sequence	**Step**	**Type**	**Description**
	1	check	The MCS Server sends a SIP SUBSCRIBE to the CMS using direct subscription/subscription proxy and the proper auid
	2	check	CMS processes the SUBSCRIBE, behaves as notifier and returns the xcap-diff document with the URL of the related document and ETAGs
	3	check	The MCS Server parses the xcap-diff document and identifies the -new/updated- service config document URL
	4	check	The MCS Server sends a HTTP GET request to the ue-config URL using OMA XDM procedures
	5	check	The MCS Server downloads correctly the service config document and parses it
	6	verify	Organization's service correctly configured according to the -new/updated- document in the CMS Server

7.9.5 Subscription and group document retrieval from the MC UE [CSC-GMS/GROUP/UE-/01]

This test case defines the procedures of GMC (GMS client in the UE) to subscribe to notification of changes of one or more MCS group documents of MCS groups identified by MCS group IDs following clauses 6.3.13.2.1, 6.3.13.3, 6.2.2 and 6.3.3.2 in [11]. Note that all the requested group IDs are owned by the own MCS provider of the GMS. The GMS performing the subscription proxy function will behave as notifier as in [32]. In the NOTIFY the URLs of the document to be retrieved and ETAGs will be provided to the CMC (assuming simplest diff-processing "no-patching" mechanism). Later, the CMC in the UE will download and parse the ue-config document using the OMA-XDM procedures defined in [36] and [37].

Note that the subscription proxy function is considered in the diagram as a part of the GMS, although it could be a common element shared by other CSC servers like in clause 7.9.7.

Message Sequence Diagram

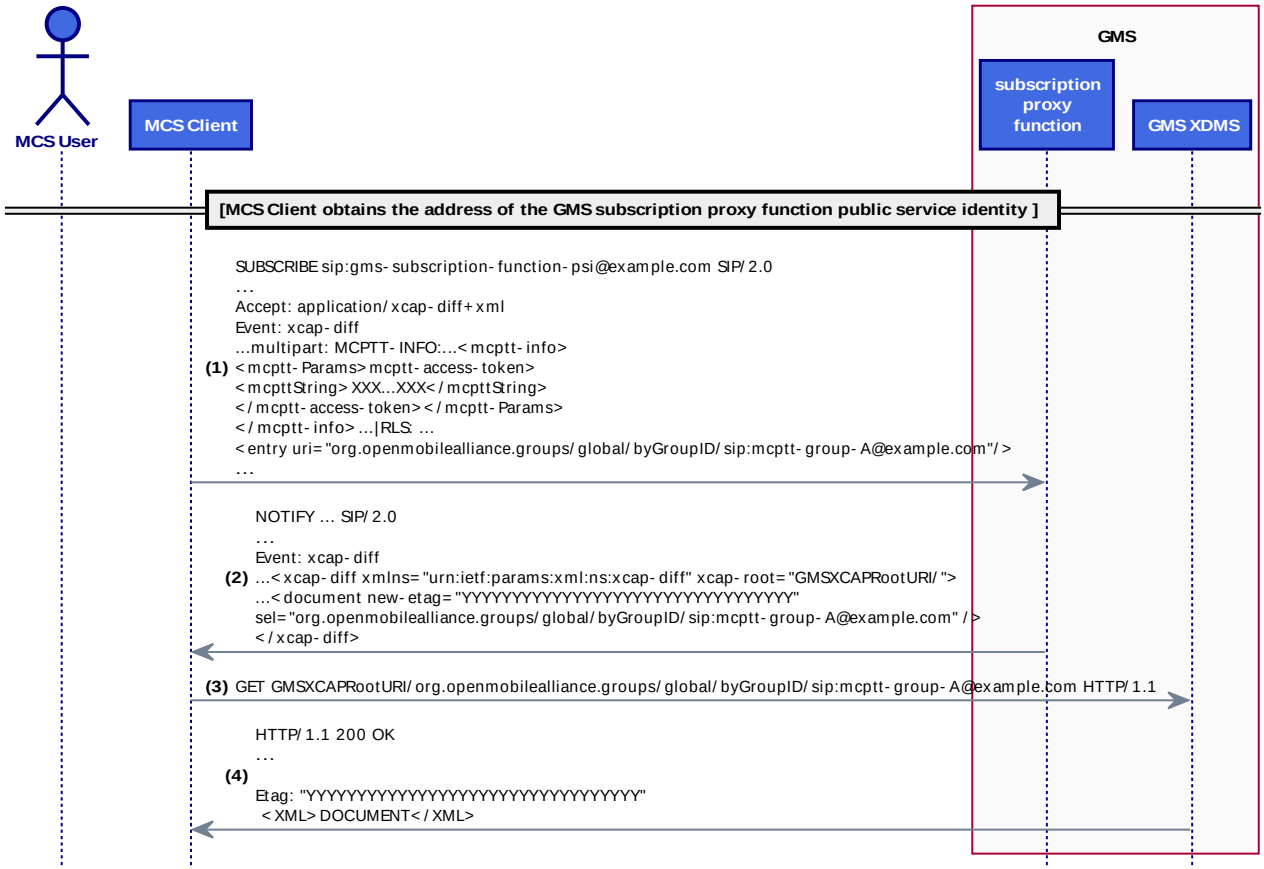

Figure 97: CSC-GMS/GROUP/UE/01 Message Sequence

Message Details

Trace Pending

Table 105: CSC-GMS/GROUP/UE/01 ITD

Interoperability Test Description	
Identifier	CSC-GMS/GROUP/UE/01
Test Objective	Verify IP connectivity, proper access from the MCS Client to the GMS and retrieval and parsing of Release 14 XML
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	• CMS access mechanism based on OMA XDM and SIP SUBSCRIBE/NOTIFY (see [14])
Applicability	• MCPTT-Client_GMS, MCData-Client_GMS, MCVideo-Client_GMS
Pre-test conditions	• IP connectivity among all elements of the specific scenario, access to the CSC servers via the proper APN • GMS subscription proxy function public service identity preconfigured

Test Sequence	Step	Type	Description
	1	check	MCS Clients sends a SIP SUBSCRIBE to the GMS subscription proxy
	2	check	GMS processes the SUBSCRIBE, behaves as notifier and returns the xcap-diff document with the URLs of the related documents and ETAGs
	3	check	GMC in the MCS client parses the xcap-diff document and identifies the URL(s) of the -new/updatedgroup document(s) by groupID
	4	check	The GMC in the MCS clients sends a HTTP GET request to the parsed URL(s) using OMA XDM procedures
	5	check	GMC downloads correctly the group document and parses it
	6	verify	MCS client correctly configured according to the new/updated-document

7.9.6 Subscription and group document retrieval from the MCS Server [CSC-GMS/GROUP/MCSSERV/01]

This test case defines the procedures of GMC (GMS client in the UE) to subscribe to notification of changes of one or more MCS group documents of MCS groups identified by MCS group IDs following clauses 6.3.13.2.2, 6.2.4 in [11] together with the mechanisms in clause 7.9.5.

Message Sequence Diagram

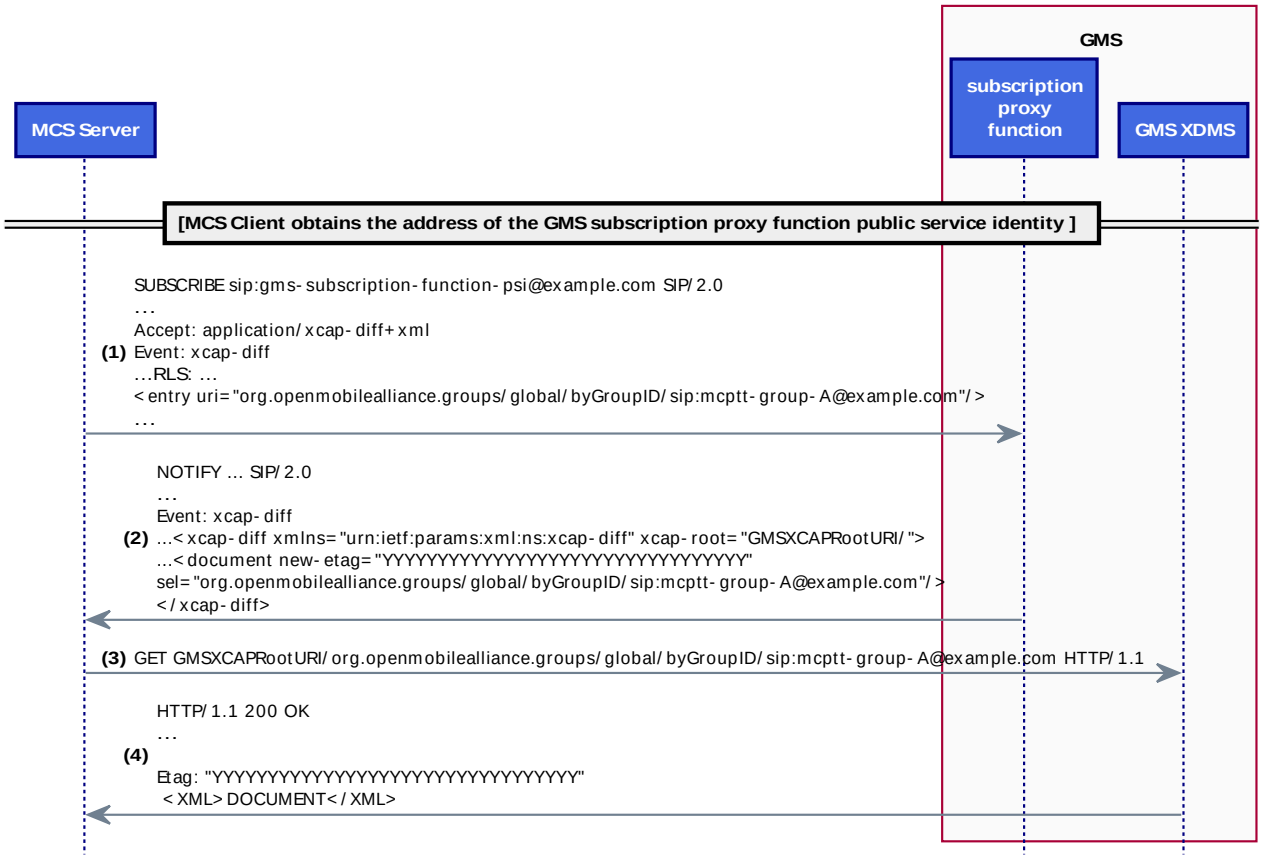

Figure 98: CSC-GMS/GROUP/MCSSERV/01 Message Sequence

Message Details

Trace Pending

Table 106: CSC-GMS/GROUP/MCSSERV/01 ITD

Interoperability Test Description			
Identifier	CSC-GMS/GROUP/MCSSERV/01		
Test Objective	Verify IP connectivity, proper access from the MCS Client to the GMS and retrieval and parsing of Release 14 XML		
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	• CMS access mechanism based on OMA XDM and SIP SUBSCRIBE/NOTIFY (see ETSI TS 124 484 [14])		
Applicability	• MCPTT-Ctrl_GMS, MCData-Ctrl_GMS, MCVideo-Ctrl_GMS		
Pre-test conditions	• IP connectivity among all elements of the specific scenario, access to the CSC servers via the proper APN • GMS subscription proxy function public service identity preconfigured		
Test Sequence	**Step**	**Type**	**Description**
	1	check	MCS sends a SIP SUBSCRIBE to the GMS subscription proxy
	2	check	GMS processes the SUBSCRIBE, behaves as notifier and returns the xcap-diff document with the URLs of the related documents and ETAGs
	3	check	The MCS Server sends parses the xcap-diff document and identifies the URL(s) of the -new/updatedgroup document(s) by groupID
	4	check	The MCS Server sends a HTTP GET request to the parsed URL(s) using OMA XDM procedures
	5	check	MCS Server downloads correctly the group document and parses it
	6	verify	MCS Server correctly configured according to the -new/updated-document

7.9.7 Subscription and retrieval of multiple documents from the CMS using subscription proxy [CSC/MULTIPLESUBS/UE/01]

Once authenticated a MCS client uses the "subscription to multiple documents simultaneously using the subscription proxy function" working modes as defined in clause 6.3.13.2.2 in ETSI TS 124 484 [14].

Message Sequence Diagram

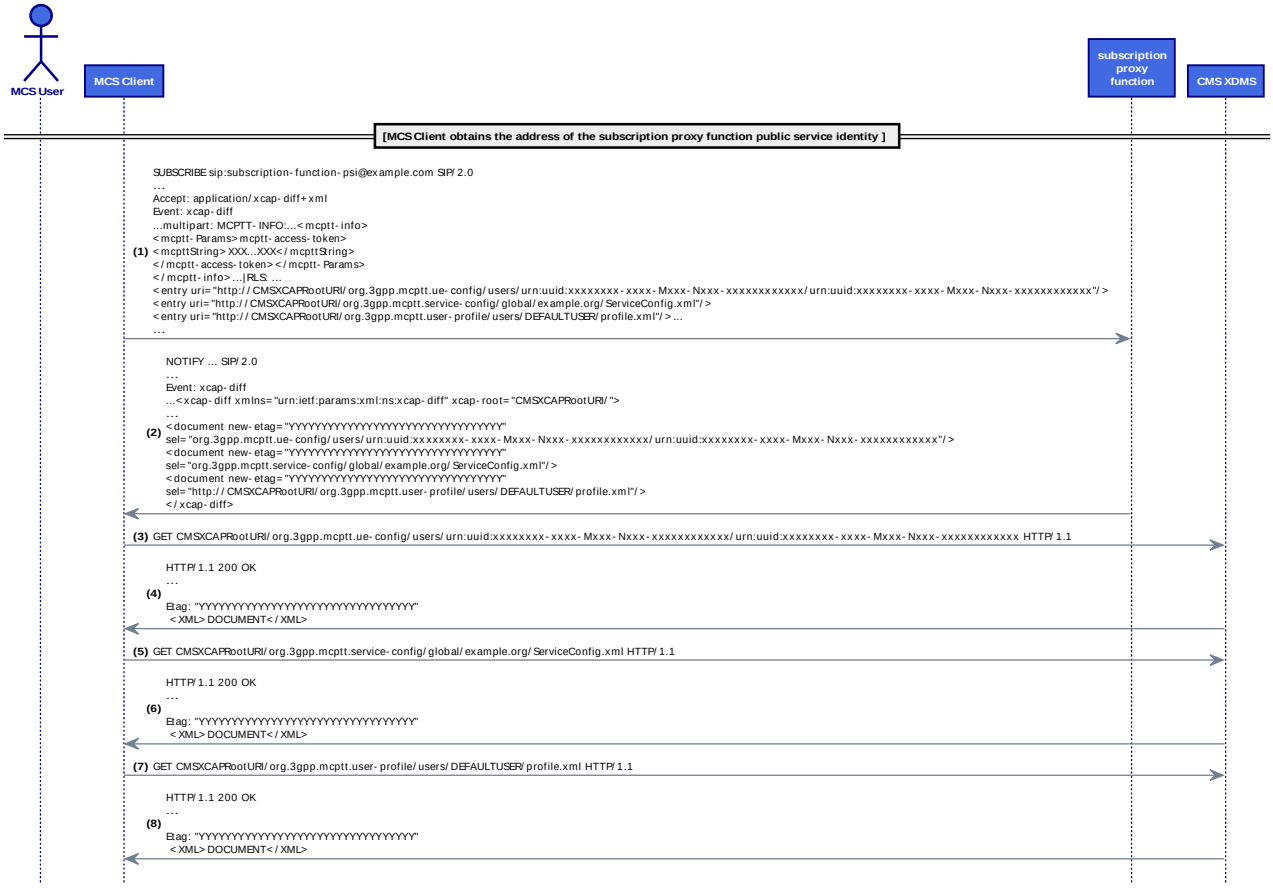

Figure 99: CSC/MULTIPLESUBS/UE/01 Message Sequence

Message Details

Trace Pending

Table 107: CSC/MULTIPLESUBS/UE/01 ITD

Interoperability Test Description	
Identifier	CSC/MULTIPLESUBS/UE/01
Test Objective	Verify IP connectivity, proper access from the MCS Client to the CMS and retrieval and parsing of Release 14 XML
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	• CMS access mechanism based on OMA XDM and SIP SUBSCRIBE/NOTIFY (see ETSI TS 124 484 [14])
Applicability	• MCPTT-Client_CMS, MCData-Client_CMS, MCVideo-Client_CMS
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	check	MCS Clients send a SIP SUBSCRIBE to the subscription proxy function psi
	2	check	Subscription proxy processes the SUBSCRIBE, behaves as notifier and returns the xcap-diff document with the URLs of the related documents and ETAGs
	3	check	CMC in the MCS client parses the xcap-diff document and identifies the -new/updated- document URL
	4	check	The CMC in the MCS client sends a HTTP GET request to the different CMS XDM related URLs using OMA XDM procedures
	5	check	CMC download correctly the document and parses them
	6	verify	MCS client correctly configured according to the new/updated-documents

7.9.8 Subscription and retrieval of multiple documents from the GMS using subscription proxy [CSC/MULTIPLESUBSGMSGROUP/UE/01]

Once authenticated a MCS client uses the "subscription to multiple documents simultaneously using the subscription proxy function" working modes as defined in clause 6.3.13.2.2 in ETSI TS 124 484 [14].

Message Sequence Diagram

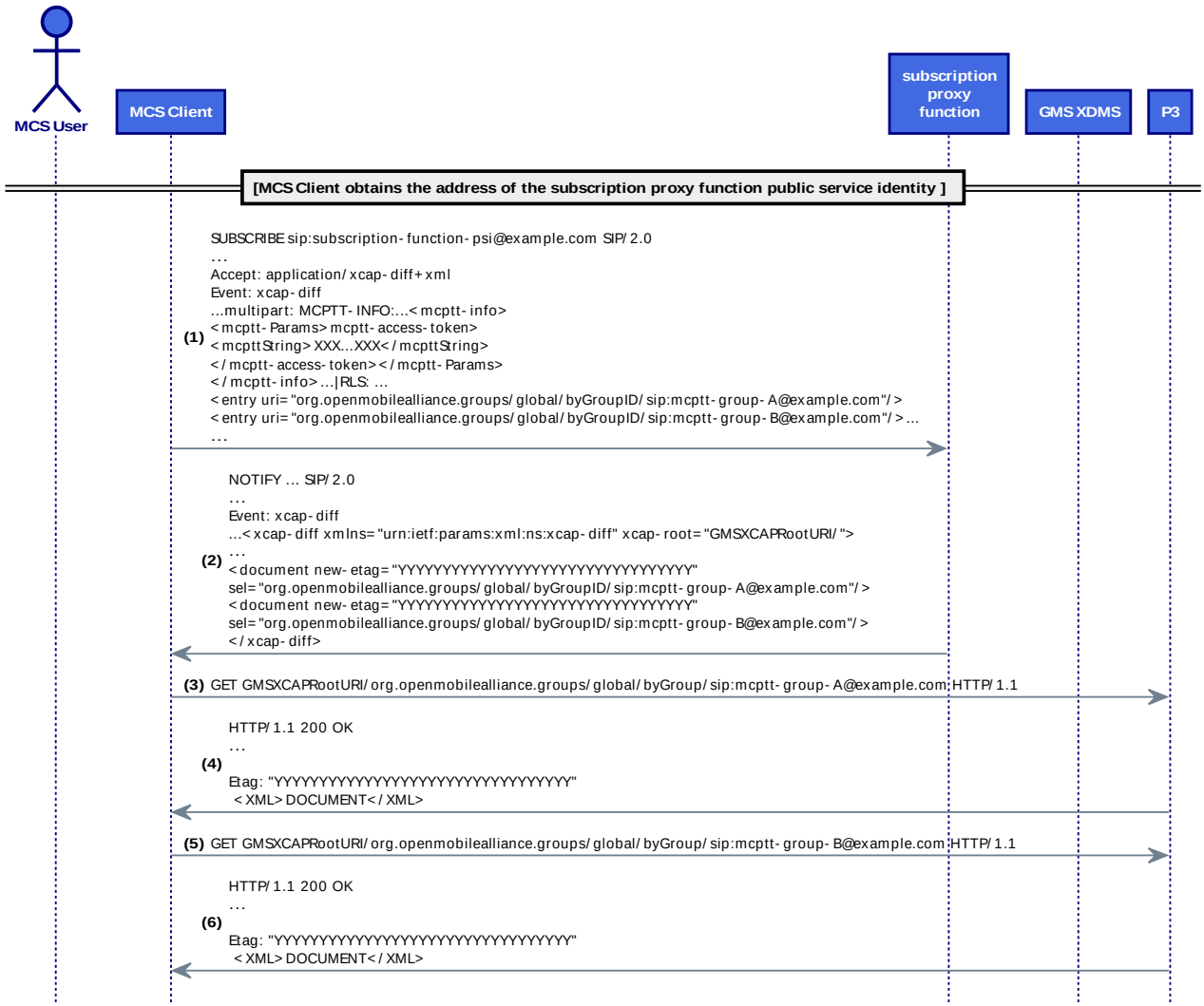

Figure 100: CSC/MULTIPLESUBSGMSGROUP/UE/01 Message Sequence

Message Details

Trace Pending

Table 108: CSC/MULTIPLESUBSGMSGROUP/UE/01 ITD

Interoperability Test Description			
Identifier	CSC/MULTIPLESUBSGMSGROUP/UE/01		
Test Objective	Verify IP connectivity, proper access from the MCS Client to the CMS and retrieval and parsing of Release 14 XML		
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	• GMS access mechanism based on OMA XDM and SIP SUB-SCRIBE/NOTIFY (see ETSI TS 124 484 [14])		
Applicability	• MCPTT-Client_GMS, MCData-Client_GMS, MCVideo-Client_GMS		
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	check	MCS Clients send a SIP SUBSCRIBE to the subscription proxy function psi
	2	check	Subscription proxy processes the SUBSCRIBE, behaves as notifier and returns the xcap-diff document with the URLs of the related documents and ETAGs
	3	check	GMC in the MCS client parses the xcap-diff document and identifies the -new/updated- document URL
	4	check	The GMC in the MCS client sends a HTTP GET request to the different GMS XDM related URLs using OMA XDM procedures
	5	check	GMC download correctly the document and parses them
	6	verify	MCS client correctly configured according to the new/updated-documents

7.10 Security mechanisms (SEC)

7.10.1 Key material download from KMS to MCPTT client (CSC-8) with proxy [SEC/KEYMDOWNLOAD/WPROXY/01]

In order to derive the keys that will be used for RTP, RTCP, floor control, MBMS control and XML encryption and to be able to decode the MIKEY-SAKKE messages sent by other clients (PCK distribution), GMS (GMK distribution) or MCPTT server (MuSiK distribution) for key distributions, the MCPTT client will need to download specific key material from a KMS. This test case deals with the standard procedure for this key material download from KMS to the MCPTT client. The MCPTT client will need to download both the KMS certificate and its own Key Set from the KMS. Key Set information can be confidentiality and integrity protected using a transport key (Trk). How the Trk is exchanged between the MCPTT client and the KMS is out of scope of the present release of the MCPTT standard. These procedures can be found in ETSI TS 133 180 [24], clause 5.3.

Two deployment options have been proposed by the MCPTT standard: a direct connection between the MCPTT client and the KMS or a non-direct connection that uses an HTTP proxy in the path. This first test case will be focused on the second option. All procedures related to KMS access using a HTTP proxy are described ETSI TS 133 180 [24], clause 5.3.3.

The MCPTT client will first need to obtain an access-token to be authenticated by the KMS (for example by using the IdMS server as described in clause 7.4.1 of the present document).

Message Sequence Diagram

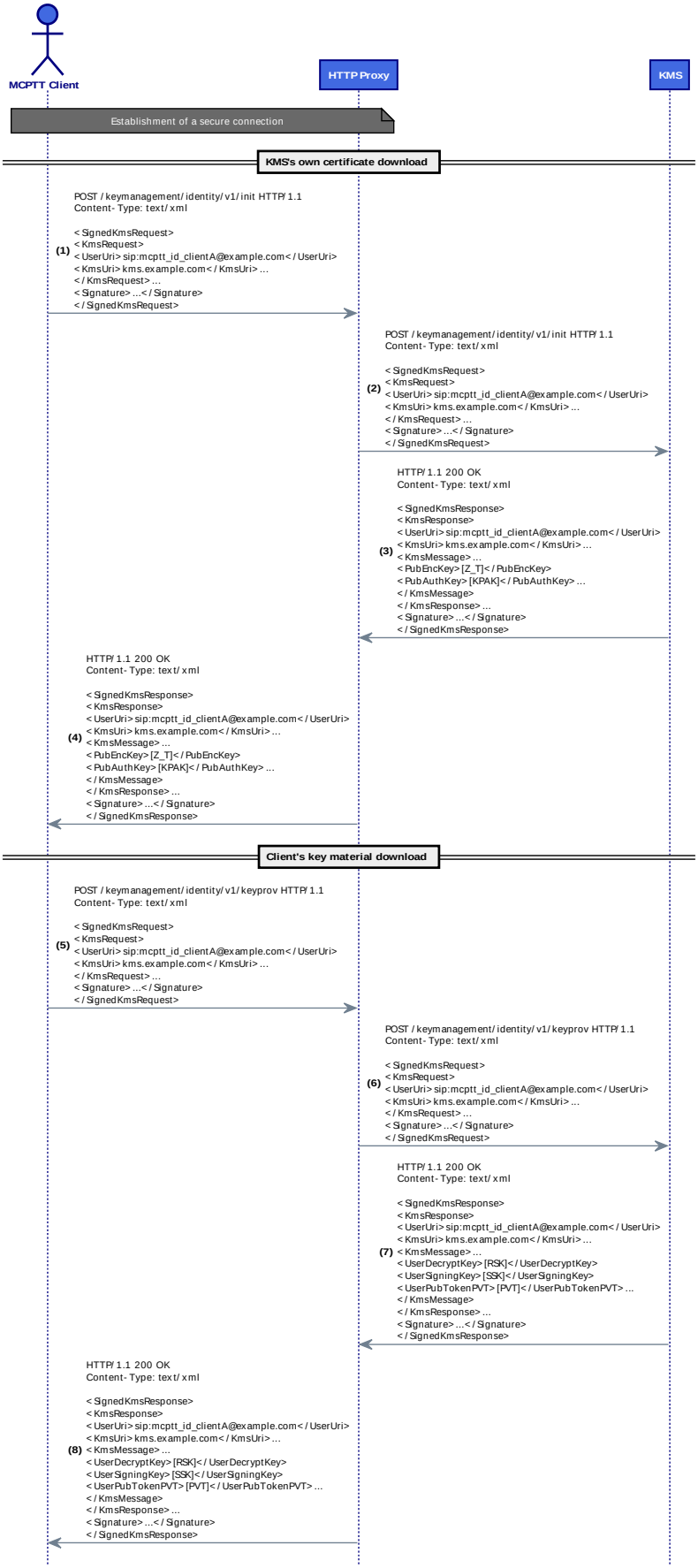

Figure 101: SEC/KEYMDOWNLOAD/WPROXY/01 Message Sequence

Message Details

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Trace Pending
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Interoperability Test Description

Table 109: SEC/KEYMDOWNLOAD/WPROXY/01 ITD

Interoperability Test Description			
Identifier	SEC/KEYMDOWNLOAD/WPROXY/01		
Test Objective	Verify KMS certificate and MCPTT client's key material download		
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	• HTTP (see IETF RFC 7230 [38]) • TLS (see IETF RFC 5246 [39]) • SSL (see IETF RFC 6101 [40])		
Applicability	• MCPTT-Client_KMS (clause 6.2)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • 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	MCPTT Client A verifies that it has no key material or the key material has already expired
	2	check	Client establishes a secure connection with the HTTP proxy
	3	check	Client sends a HTTP POST request to obtain the KMS certificate
	4	check	HTTP POST request contains the access-token
	5	check	HTTP proxy forwards the HTTP POST request to KMS
	6	check	KMS responds with its own certificate
	7	check	HTTP proxy forwards the response
	8	check	Client receives KMS's own certificate
	9	check	Client sends a HTTP POST request to obtain its key material
	10	check	HTTP POST request contains the access-token
	11	check	HTTP proxy forwards the HTTP POST request to KMS
	12	check	KMS responds with the key material of client A
	13	check	HTTP proxy forwards the response
	14	check	Client receives its key material

7.10.2 Key material download from KMS to MCPTT server (CSC-9) with proxy [SEC/KEYMDOWNLOAD/WPROXY/02]

In order to derive the keys that will be used for MBMS control (MuSiK) and to be able to decode the MIKEY-SAKKE messages sent by clients (CSK distribution), the MCPTT server will need to download specific key material from a KMS. This test is similar to the one described in clause 7.10.1 but for the MCPTT server case.

Message Sequence Diagram

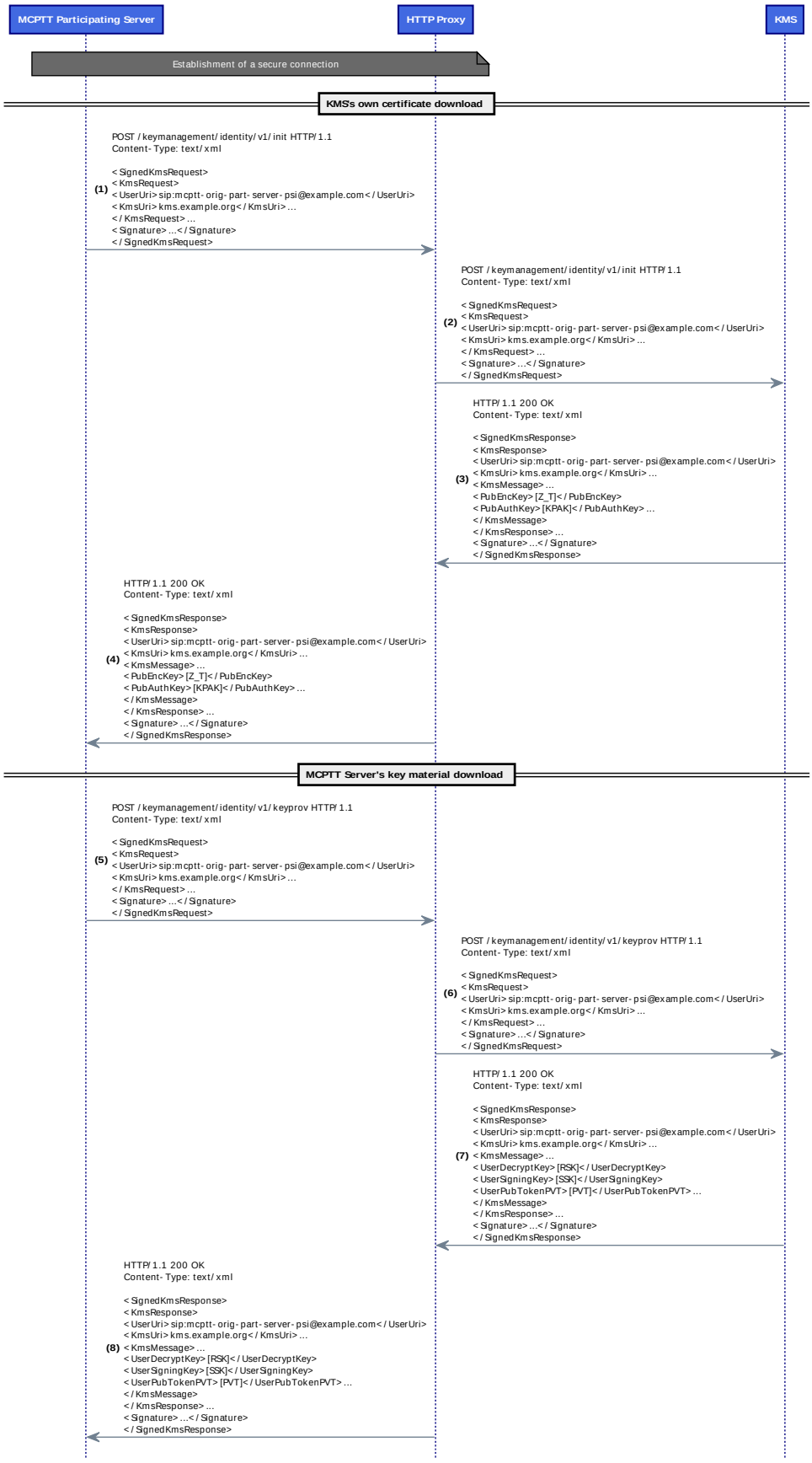

Figure 102: SEC/KEYMDOWNLOAD/WPROXY/02 Message Sequence

Message Details

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Trace Pending
```

Interoperability Test Description

Table 110: SEC/KEYMDOWNLOAD/WPROXY/02 ITD

Interoperability Test Description			
Identifier	SEC/KEYMDOWNLOAD/WPROXY/02		
Test Objective	Verify KMS certificate and MCPTT server's key material download		
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	• HTTP (see IETF RFC 7230 [38]) • TLS (see IETF RFC 5246 [39]) • SSL (see IETF RFC 6101 [40])		
Applicability	• MCPTT-Part_KMS		
Pre-test conditions	• IP connectivity among all elements of the specific scenario		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	MCPTT server verifies that it has no key material or the key material has already expired
	2	check	MCPTT server establishes a secure connection with the HTTP proxy
	3	check	MCPTT server sends a HTTP POST request to obtain the KMS certificate
	4	check	HTTP POST request contains the access-token
	5	check	HTTP proxy forwards the HTTP POST request to KMS
	6	check	KMS responds with its own certificate
	7	check	HTTP proxy forwards the response
	8	check	MCPTT server receives KMS's own certificate
	9	check	MCPTT server sends a HTTP POST request to obtain its key material
	10	check	HTTP POST request contains the access-token
	11	check	HTTP proxy forwards the HTTP POST request to KMS
	12	check	KMS responds with the key material of MCPTT server
	13	check	HTTP proxy forwards the response
	14	check	MCPTT server receives its key material

7.10.3 Key material download from KMS to MCPTT GMS (CSC-10) with proxy [SEC/KEYMDOWNLOAD/WPROXY/03]

In order to derive the keys that will be used for the RTP encryption of MCPTT group calls (GMK) and to be able to encode the MIKEY-SAKKE messages sent for the distribution of these keys, the GMS will need to download specific key material from a KMS. This test is similar to the one described in clause 7.10.1 but for the GMS case.

Message Sequence Diagram

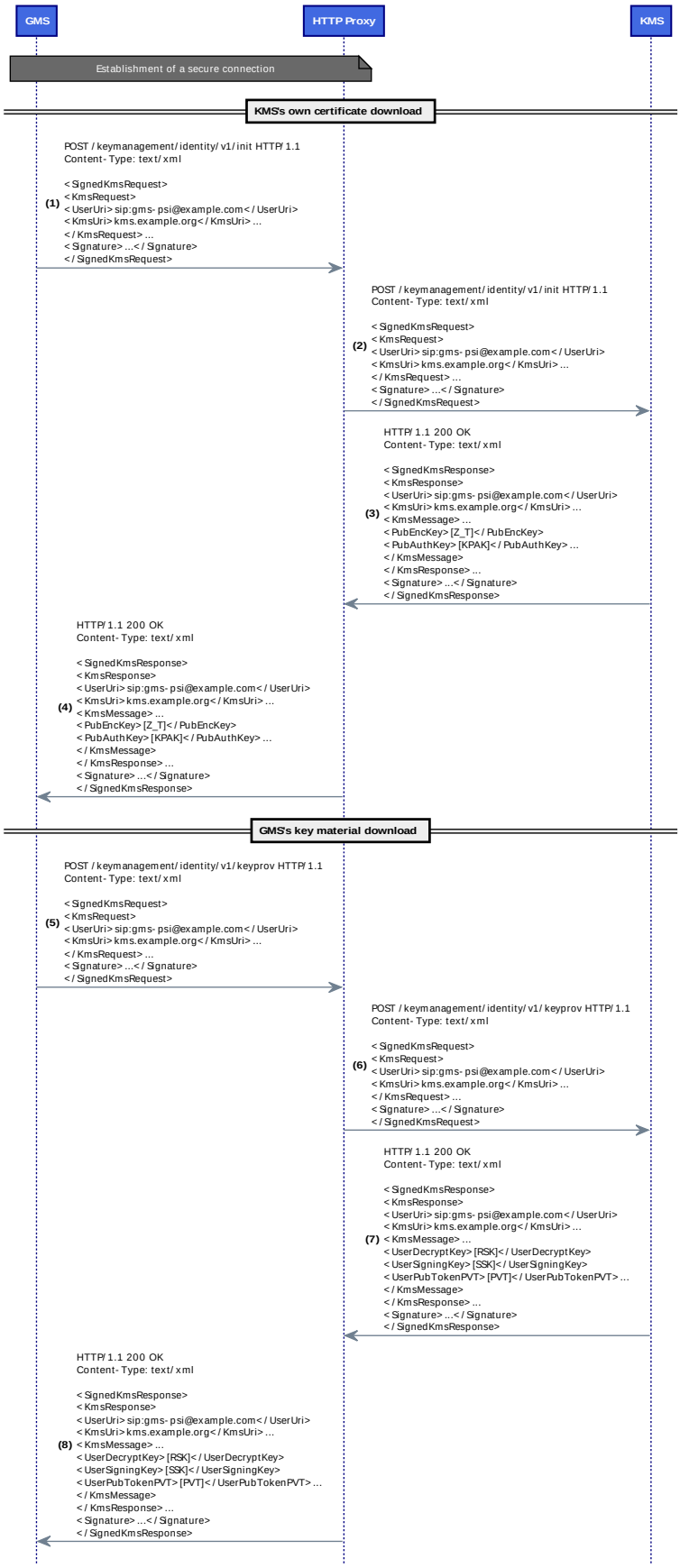

Figure 103: SEC/KEYMDOWNLOAD/WPROXY/03 Message Sequence

Message Details

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Trace Pending
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Interoperability Test Description

Table 111: SEC/KEYMDOWNLOAD/WPROXY/03 ITD

Interoperability Test Description			
Identifier	SEC/KEYMDOWNLOAD/WPROXY/03		
Test Objective	Verify KMS certificate and GMS' key material download		
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	• HTTP (see IETF RFC 7230 [38]) • TLS (see IETF RFC 5246 [39]) • SSL (see IETF RFC 6101 [40])		
Applicability	• GMS_KMS		
Pre-test conditions	• IP connectivity among all elements of the specific scenario		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	GMS verifies that it has no key material or the key material has already expired
	2	check	GMS establishes a secure connection with the HTTP proxy
	3	check	GMS sends a HTTP POST request to obtain the KMS certificate
	4	check	HTTP POST request contains the access-token
	5	check	HTTP proxy forwards the HTTP POST request to KMS
	6	check	KMS responds with its own certificate
	7	check	HTTP proxy forwards the response
	8	check	GMS receives KMS's own certificate
	9	check	GMS sends a HTTP POST request to obtain its key material
	10	check	HTTP POST request contains the access-token
	11	check	HTTP proxy forwards the HTTP POST request to KMS
	12	check	KMS responds with the key material of GMS
	13	check	HTTP proxy forwards the response
	14	check	GMS receives its key material

7.10.4 Key material download from KMS to MCPTT client (CSC-8) without proxy [SEC/KEYMDOWNLOAD/WOPROXY/01]

This procedure is similar to the one described in clause 7.10.1 of the present document but without using an HTTP proxy in the connection path.

Message Sequence Diagram

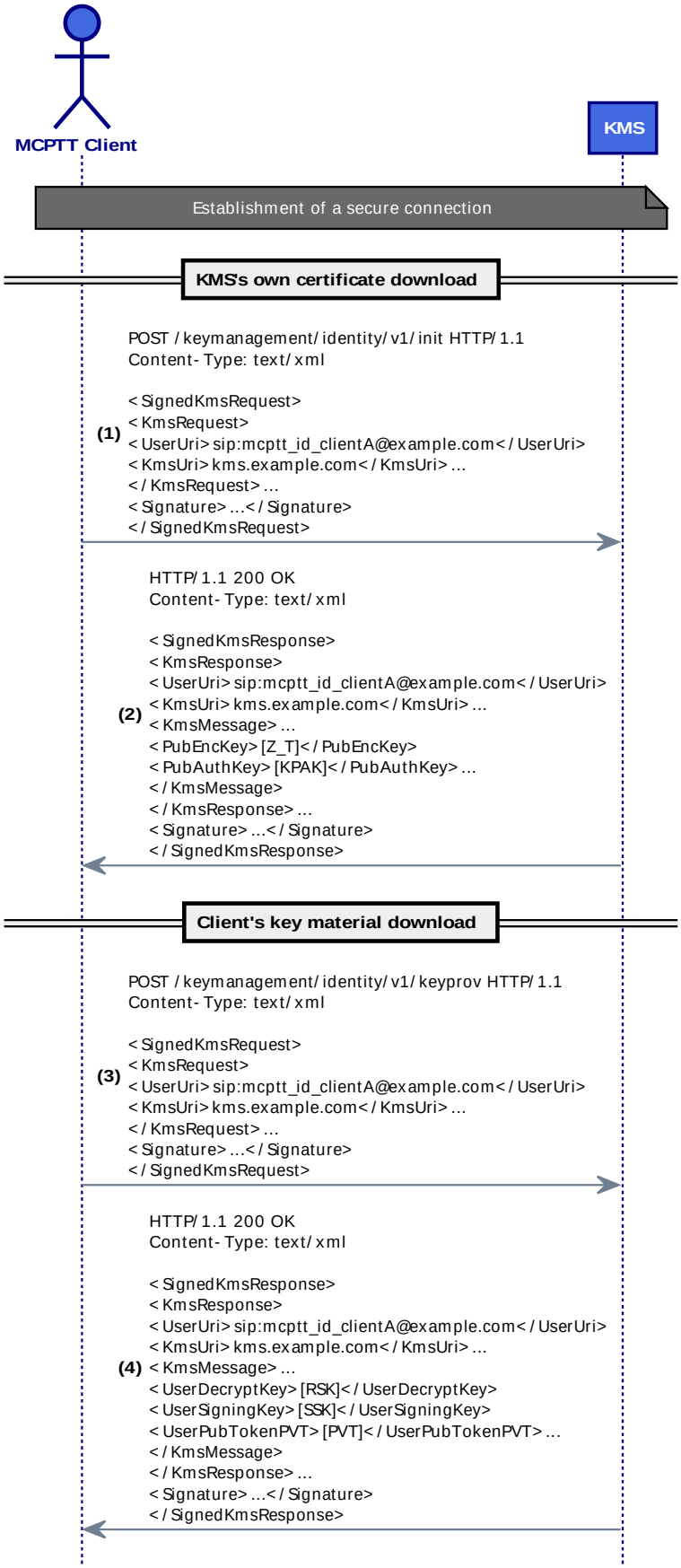

Figure 104: SEC/KEYMDOWNLOAD/WOPROXY/01 Message Sequence

Message Details

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Trace Pending
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Interoperability Test Description

Table 112: SEC/KEYMDOWNLOAD/WOPROXY/01 ITD

Interoperability Test Description			
Identifier	SEC/KEYMDOWNLOAD/WOPROXY/01		
Test Objective	Verify KMS certificate and MCPTT client's key material download		
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	• HTTP (see IETF RFC 7230 [38]) • TLS (see IETF RFC 5246 [39]) • SSL (see IETF RFC 6101 [40])		
Applicability	• MCPTT-Client_KMS (clause 6.2)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario • 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	MCPTT Client A verifies that it has no key material or the key material has already expired
	2	check	Client establishes a secure connection with the KMS
	3	check	Client sends a HTTP POST request to obtain the KMS certificate
	4	check	HTTP POST request contains the access-token
	5	check	KMS responds with its own certificate
	6	check	Client receives KMS's own certificate
	7	check	Client sends a HTTP POST request to obtain its key material
	8	check	HTTP POST request contains the access-token
	9	check	KMS responds with the key material of client A
	10	check	Client receives its key material

7.10.5 Key material download from KMS to MCPTT server (CSC-9) without proxy [SEC/KEYMDOWNLOAD/WOPROXY/02]

This procedure is similar to the one described in clause 7.10.2 of the present document but without using an HTTP proxy in the connection path.

Message Sequence Diagram

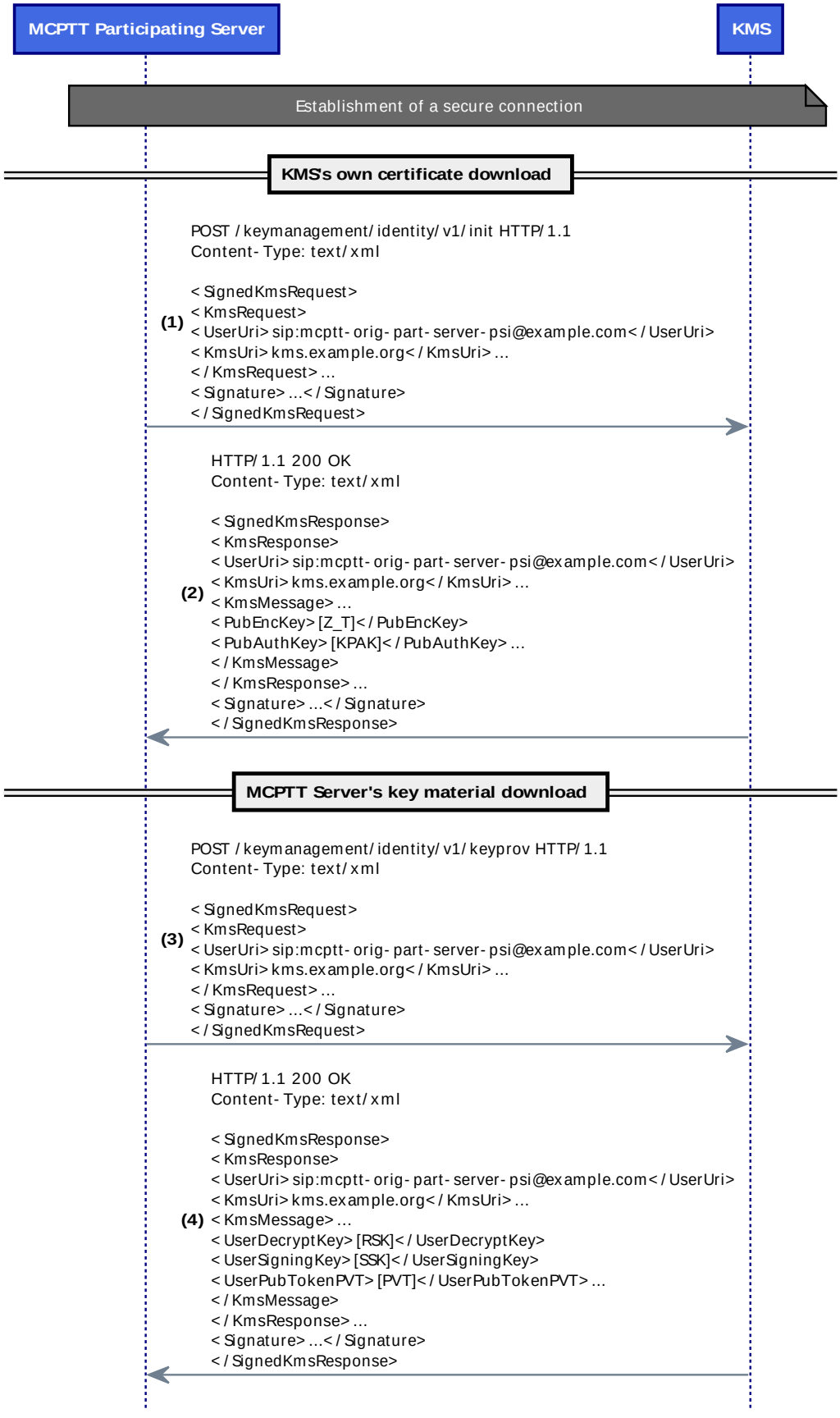

Figure 105: SEC/KEYMDOWNLOAD/WOPROXY/02 Message Sequence

Message Details

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Trace Pending
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Interoperability Test Description

Table 113: SEC/KEYMDOWNLOAD/WOPROXY/02 ITD

Interoperability Test Description			
Identifier	SEC/KEYMDOWNLOAD/WOPROXY/02		
Test Objective	Verify KMS certificate and MCPTT server's key material download		
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	• HTTP (see IETF RFC 7230 [38]) • TLS (see IETF RFC 5246 [39]) • SSL (see IETF RFC 6101 [40])		
Applicability	• MCPTT-Part_KMS (clause 6.2)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	MCPTT server verifies that it has no key material or the key material has already expired
	2	check	MCPTT server establishes a secure connection with the KMS
	3	check	MCPTT server sends a HTTP POST request to obtain the KMS certificate
	4	check	HTTP POST request contains the access-token
	5	check	KMS responds with its own certificate
	6	check	MCPTT server receives KMS's own certificate
	7	check	MCPTT server sends a HTTP POST request to obtain its key material
	8	check	HTTP POST request contains the access-token
	9	check	KMS responds with the key material of client A
	10	check	MCPTT server receives its key material

7.10.6 Key material download from KMS to MCPTT GMS (CSC-10) without proxy [SEC/KEYMDOWNLOAD/WOPROXY/03]

This procedure is similar to the one described in clause 7.10.3 of the present document but without using an HTTP proxy in the connection path.

Message Sequence Diagram

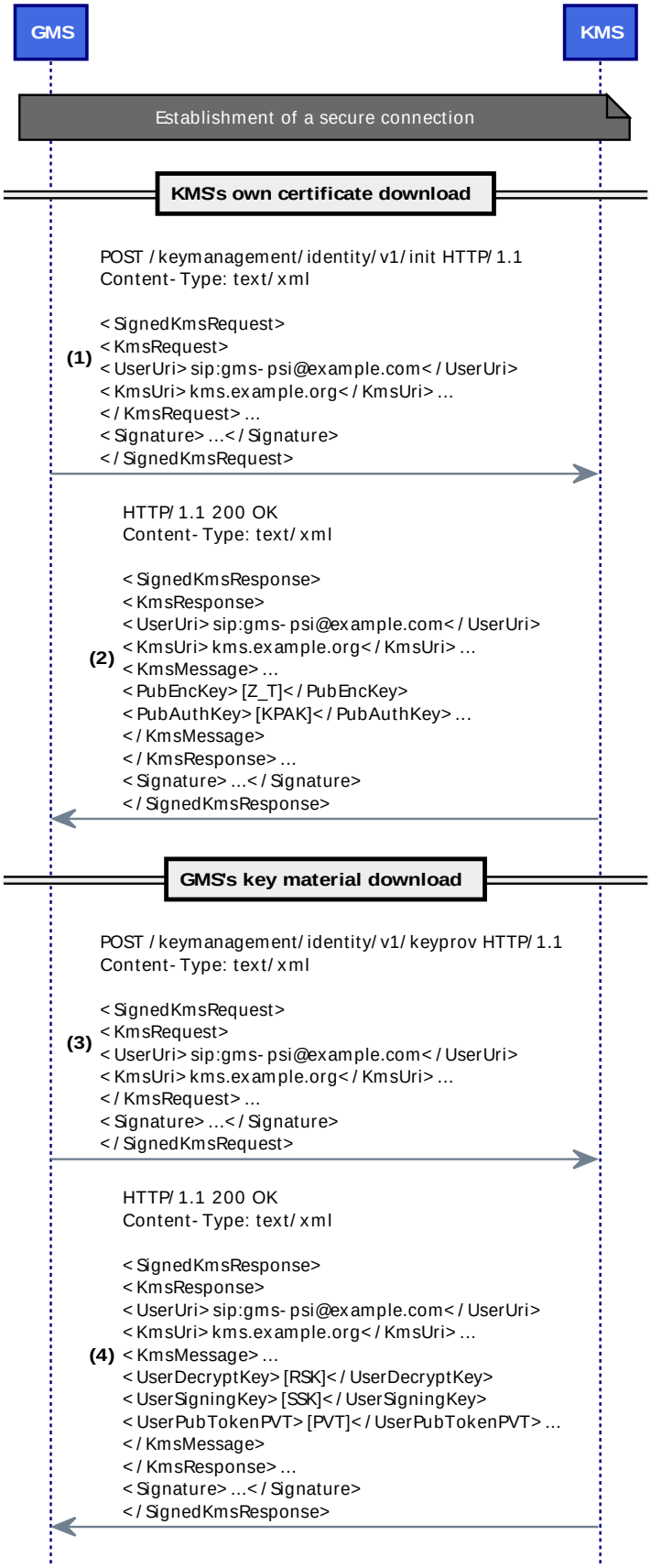

Figure 106: SEC/KEYMDOWNLOAD/WOPROXY/03 Message Sequence

Message Details

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Trace Pending
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Interoperability Test Description

Table 114: SEC/KEYMDOWNLOAD/WOPROXY/03 ITD

Interoperability Test Description			
Identifier	SEC/KEYMDOWNLOAD/WOPROXY/03		
Test Objective	Verify KMS certificate and GMS' key material download		
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	• HTTP (see IETF RFC 7230 [38]) • TLS (see IETF RFC 5246 [39]) • SSL (see IETF RFC 6101 [40])		
Applicability	• GMS_KMS (clause 6.2)		
Pre-test conditions	• IP connectivity among all elements of the specific scenario		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	GMS verifies that it has no key material or the key material has already expired
	2	check	GMS establishes a secure connection with the KMS
	3	check	GMS sends a HTTP POST request to obtain the KMS certificate
	4	check	HTTP POST request contains the access-token
	5	check	KMS responds with its own certificate
	6	check	GMS receives KMS's own certificate
	7	check	GMS sends a HTTP POST request to obtain its key material
	8	check	HTTP POST request contains the access-token
	9	check	KMS responds with the key material of client A
	10	check	GMS receives its key material

7.10.7 Key management from MC client to MC server (CSK upload) [SEC/KEYDIST/CSK/01]

CSK keys are used by the MCPTT client to protect RTCP packets, floor control packets and also for the XML content confidentiality and integrity protection. The key is generated by the MCPTT client and distributed to the MCPTT participating server so that it can decrypt this information. CSK is sent to the participating server encoded in a MIKEY-SAKKE message which is included in the REGISTER message used for service authorization.

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 assume 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 [9]). Additionally, the user has previously downloaded the key material from the KMS as described in clauses 7.10.1 or 7.10.4 and has generated the CSK key. The REGISTER message will contain a multipart body comprised of the mcptt-info body with the Access Token and MCPTT Client ID and an application/mikey part which contains an MIKEY-SAKKE I_MESSAGE with the encoded CSK key constructed as described in clause E.4 in [24] using the key material obtained from the KMS as described in clauses 7.10.1 or 7.10.4 of the present document. More details about the structure of this REGISTER message can be found in clause 7.2.1 in [9].

Only CSK upload will be tested here following the procedure described in clauses 5.4 and 9.2.1 in [24]. No CSK download procedure will be included in the present document. Neither confidentiality nor integrity protection of the mcptt-info content will be required in this test case (a specific XML content encryption test case has been included in clause 7.10.17 of the present document).

There is another alternative to upload the CSK using PUBLISH messages for service authorization and service settings. This would be a similar procedure to the one described in clause 7.4.3 of the present document, but including the application/mikey body in the PUBLISH message.

Message Sequence Diagram

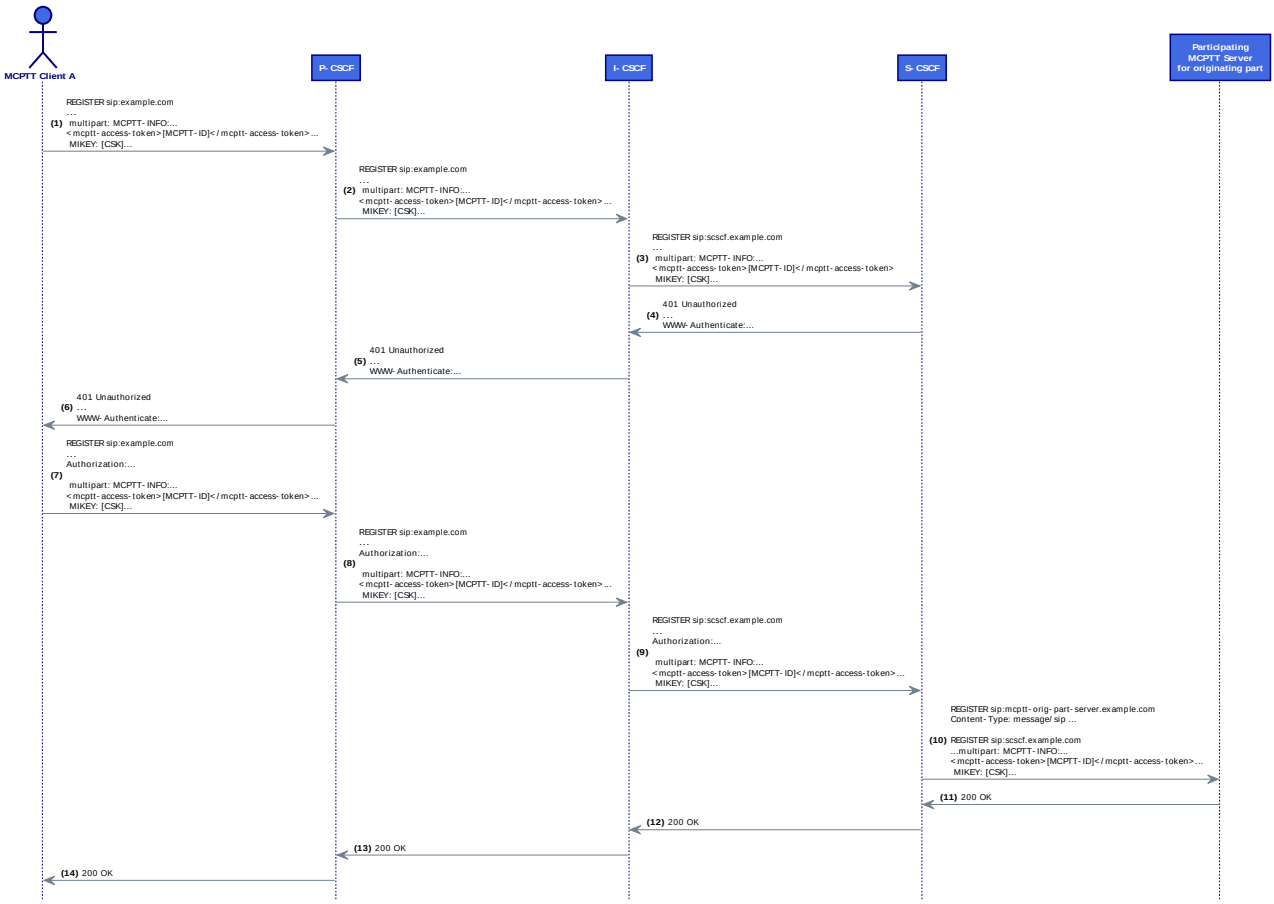

Figure 107: SEC/KEYDIST/CSK/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 115: SEC/KEYDIST/CSK/01 ITD

Interoperability Test Description			
Identifier	SEC/KEYDIST/CSK/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and CSK distribution		
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 [6] and other references in [9])		
Applicability	• MCPTT-Client_KMS, MCPTT-Client_REGREG (clause 6.2) • MCPTT-Part_KMS, MCPTT-Part_REGAUTH (clause 6.7) • 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 • UEs properly registered to the SIP core/IMS • Static/dynamic mapping of the SIP identity (i.e. IMPU) vs. mcptt_id • Client has previously obtained key material from KMS • MCPTT server has previously obtained key material from KMS		
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	Body includes MIKEY I_MESSAGE with CSK key
	4	check	REGISTER sent to the S-CSCF
	5	check	S-CSCF creates a 3rd Party Register towards the participating and embeds the original REGISTER as body
	6	verify	User 1 correctly registered to the IMS Core and MCPTT participating. IMPU vs. mcptt_id binding and service authorization completed.
	7	check	MCPTT participating stores client's CSK.

7.10.8 Key management for group communications (GMK) [SEC/KEYDIST/GMK/01]

GMK keys are used by the MCPTT clients to protect RTP packets in MCPTT group calls. The GMK is generated by the GMS and distributed to the MCPTT clients so that they can encrypt and decrypt the RTP flow. GMK is generated by the GMS for each group and is sent to the members of the group encoded in MIKEY-SAKKE messages, which are included in NOTIFY messages. The client subscribes to the MCPTT-GKTP document separately or together with the MCPTT group subscription (only separate subscription will be analysed here). SUBSCRIBE messages have multipart bodies comprised of application/resource-lists+xml and application/vnd.3gpp.mcptt-info+xml parts. Resource-lists part includes the URL of the MCPTT-GKTP document and the mcptt-info part contains the MCPTT Group ID of the group from which the client wants to obtain its GMK. NOTIFY messages sent from GMS have an xcap-diff content, which has been extended to contain MIKEY-SAKKE I_MESSAGEs with the encoded GMK key. The structure of MIKEY-SAKKE messages for GMK distribution is described in clause E.2 in [24]. More details about how to compose SUBSCRIBE and NOTIFY messages can be found in clause 6.3.13 in [11].

The test case assumes that the GMS has previously downloaded the key material from the KMS as described in clauses 7.10.3 or 7.10.6.

Message Sequence Diagram

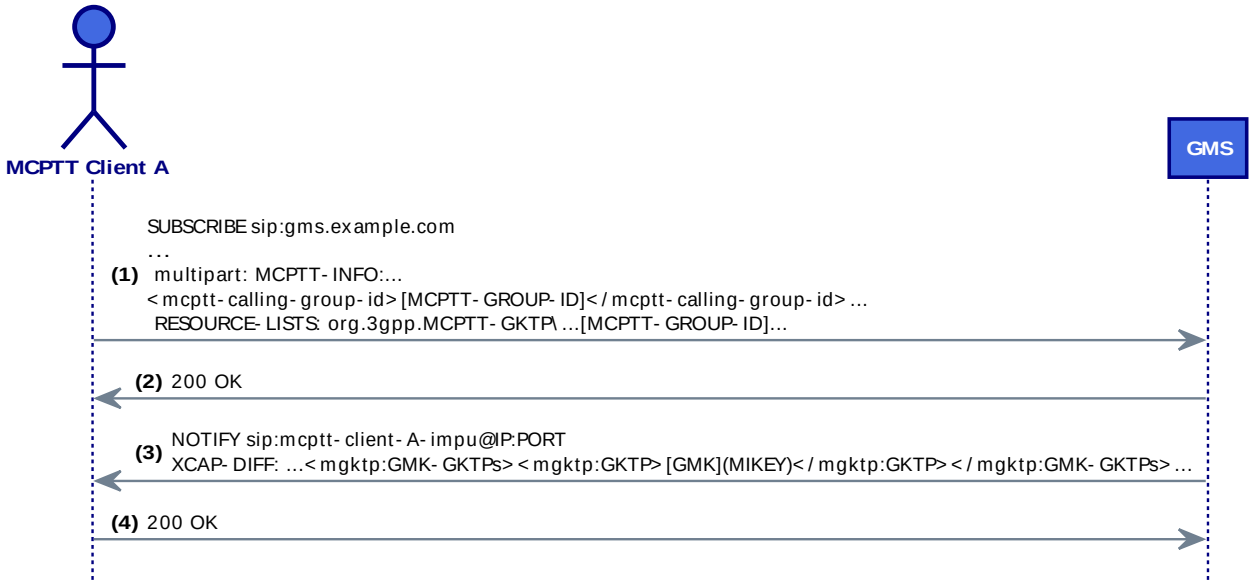

Figure 108: SEC/KEYDIST/GMK/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 116: SEC/KEYDIST/GMK/01 ITD

	Interoperability Test Description
Identifier	SEC/KEYDIST/GMK/01
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and GMK distribution
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 [6] and other references in ETSI TS 124 379 [9] and ETSI TS 124 481 [11])
Applicability	• MCPTT-Client_KMS, MCPTT-Client_ONN-MCPTT-CALL (clause 6.2) • GMS_KMS
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 • Client has previously obtained key material from KMS • GMS has previously obtained key material from KMS

Test Sequence	Step	Type	Description
	1	check	MCPTT client sends a SIP SUBSCRIBE to the GMS
	2	check	GMS processes the SUBSCRIBE, behaves as notifier and returns the xcap-diff document with the MIKEY-SAKKE message including the GMK
	3	check	MCPTT client parses the xcap-diff document and extracts the MIKEY-SAKKE message
	4	verify	MCPTT client correctly obtains the GMK from the MIKEY-SAKKE message

7.10.9 Key management from MC server to MC client (Key download MuSiK) [SEC/KEYDIST/MUSIK/01]

MuSiK keys are used by the MCPTT servers to protect RTCP packets sent in MBMS. MuSiK is generated by the participating MCPTT server and distributed to the MCPTT client so that it can decrypt those packets. The key is sent to the clients encoded in MIKEY-SAKKE messages, which are added to SIP MESSAGEs for eMBMS subchannel announcements (see clause 7.6). These messages will have multipart bodies now. Apart from sending mbms-usage-info, they will also include an application/mikey body with the encoded MuSiK key. The structure of MIKEY-SAKKE messages for MuSiK distribution is described in clause E.4 of [24]. More details about how to compose SIP MESSAGE messages for MuSiK distribution can be found in clause 14.2.2.5 of [9]. Test Case assume that both the MCPTT client and MCPTT server have previously downloaded the key material from the KMS as described in clauses 7.10.1, 7.10.4, 7.10.2 and 7.10.5 respectively.

Message Sequence Diagram

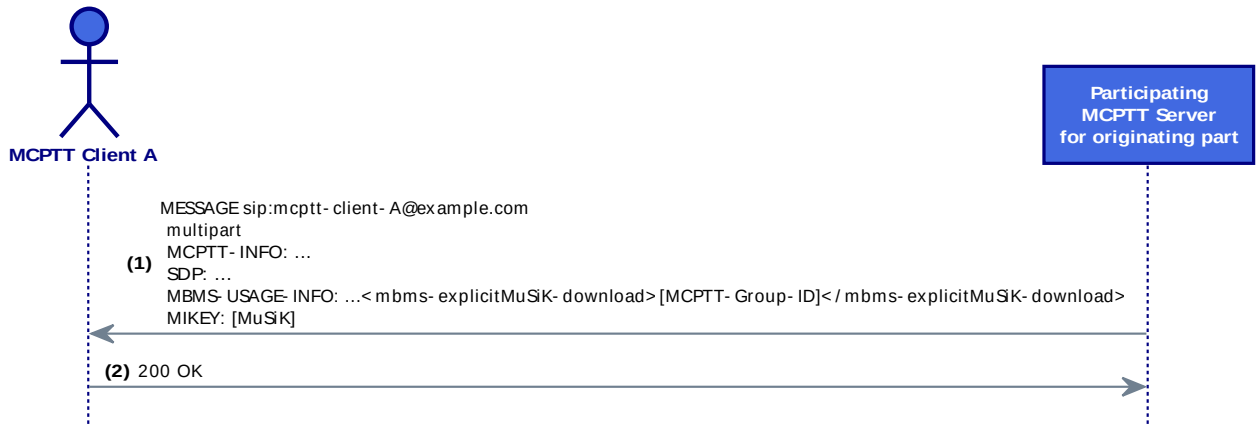

Figure 109: SEC/KEYDIST/MUSIK/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 117: SEC/KEYDIST/MUSIK/01 ITD

Interoperability Test Description			
Identifier	SEC/KEYDIST/MUSIK/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and MuSiK distribution		
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 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_KMS, MCPTT-Client_EMBMS, MCPTT-Client_ONNMCPTT-CALL (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_GCSE (clause 6.7) • BM-SC_GCSE • EPS_EMBMS		
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 • Client has previously obtained key material from KMS • MCPTT server has previously obtained key material from KMS		
Test Sequence	**Step**	**Type**	**Description**
	1	stimulus	MCPTT participating server sends SIP MESSAGE to MCPTT client with the MIKEY-SAKKE message including the MuSiK
	2	check	MCPTT client parses the content and extracts the MIKEY-SAKKE message
	3	verify	MCPTT client correctly obtains the MuSiK from the MIKEY-SAKKE message

7.10.10 Encryption of MCPTT private calls (use of derived encryption keys from PCK for the audio and CSK for floor control and RTCP reports) [SEC/ENCRYPTION/PRIVATE/01]

This test assumes that both media and MCPTT signalling protection has been configured in the system. Only one type of MCPTT private call will be tested to demonstrate the encryption of RTP/RTCP and XML contents and URI attributes: an on-demand on-network private call with automatic commencement and floor control (a non-protected version of this test case can be found in clause 7.2.15). The following conditions should be met to be able to complete this test:

- Both MCPTT clients should have downloaded their key material from KMS (see clause 7.10.1 or 7.10.4).
- Both MCPTT clients should have distributed their CSK keys to the corresponding participating server by using either REGISTER or PUBLISH requests (see clause 7.10.7).
- MCPTT participating servers should have downloaded their key material from KMS (see clause 7.10.2 or 7.10.5).
- SPK keys have been configured in server pairs.
- The caller generates a PCK key for RTP encryption and builds a MIKEY-SAKKE I_MESSAGE for the callee as described in clause E.3 of [24] (see note 1).
- The callee is able to decode the PCK key from the MIKEY message.
- All encryption keys are derived using the corresponding methods (PRF functions for RTP/RTCP encryption and KDF functions for XML encryption) as described in [24] in each node.

A default security profile will be used for the encryption of the RTP flow as described in clause E.3.2 in [24]. The use of encrypted audio will be indicated with the use of the RTP/SAVP profile in the SDP of the initial INVITE request.

MCPTT signalling encryption is applied to the XML contents of mcptt-info and resource-lists bodies of the INVITE request that establishes the private call (see clause 7.10.13).

NOTE 1: No specific clause for describing the PCK key distribution procedure has been included in the present document. The MIKEY-SAKKE I_MESSAGE for PCK distribution are included in the SDP part of the INVITE request in an "a=key-mgmt:mikey" attribute. More details on how to include this information in INVITE messages can be found in clauses 4.7.1 and 6.2.1 in [9].

NOTE 2: If it is not possible to test the distribution of the different keys, a test with fixed keys could be considered.

Message Sequence Diagram

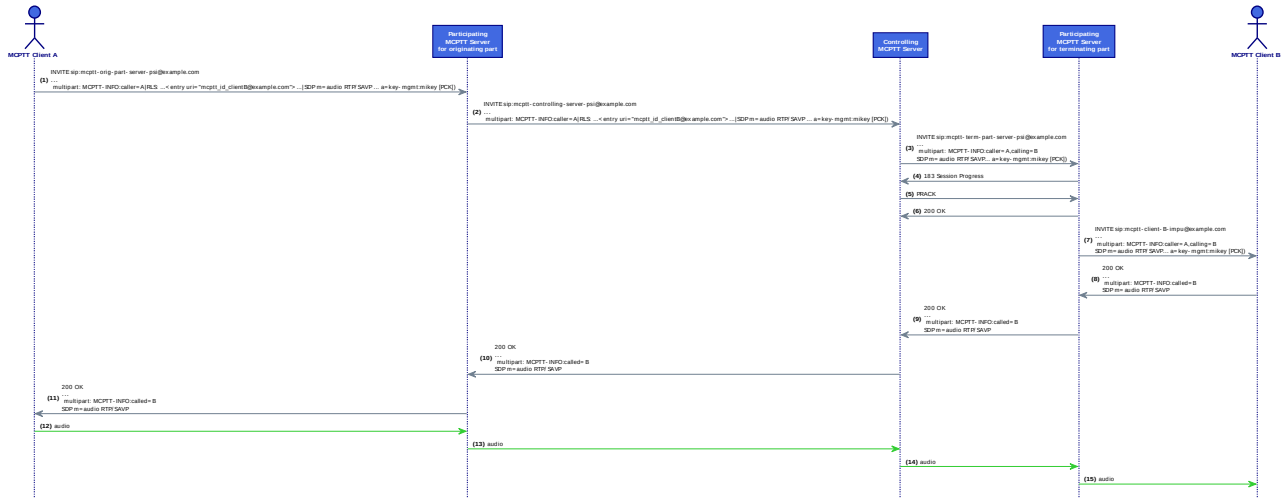

Figure 110: SEC/ENCRYPTION/PRIVATE/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 118: SEC/ENCRYPTION/PRIVATE/01 ITD

Interoperability Test Description			
Identifier	SEC/ENCRYPTION/PRIVATE/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling, private call MCPTT signalling protection and RTP/RTCP encryption		
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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_KMS, MCPTT-Client_ONN-MCPTT-CALL, MCPTTClient_AMR-WB, MCPTT-Client_MCPTT-FC, MCPTT-Client_ONNSEC-XML, MCPTT-Client, ONN-SEC-MEDIA (clause 6.2) • MCPTT-Part_KMS, MCPTT-Part_ONN-MCPTT-CALL, MCPTTPart_MCPTT-FC, MCPTT-Part_ONN-SEC-XML, MCPTT-Part_ONNSEC-MEDIA (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_ONN-SEC-XML, MCPTT-Ctrl_ONN-SEC-MEDIA (clause 6.8)		
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 • XML protection and RTP/RTCP protection has been configured in the system • CSK keys have been distributed to participating servers • SPK keys have been configured per server pairs		
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 User1
	3	check	SDP indicates RTP/SAVP profile and mcptt-info and rls bodies are encrypted
	4	check	The participating server adapts the mcptt-info accordingly and creates an INVITE to the controlling server
	5	check	SDP indicates RTP/SAVP profile and mcptt-info and rls bodies are encrypted
	6	check	The controlling server check permissions and forward the INVITE to the participating server of the callee
	7	check	SDP indicates RTP/SAVP profile and mcptt-info body is encrypted
	8	check	Upon arrival of the INVITE adapted by the terminating participating function at User 2 the call is automatically taken
	9	verify	Call connected and encrypted media flows exchanged

7.10.11 Encryption of MCPTT group calls (use of derived encryption keys from GMK for the audio and CSK for floor control and RTCP reports) [SEC/ENCRYPTION/GROUP/01]

This test assumes that both media and MCPTT signalling protection has been configured in the system. Only one type of MCPTT group call will be tested to demonstrate the encryption of RTP/RTCP and XML contents and URI attributes: an on-demand on-network prearranged group call (a non-protected version of this test case can be found in clause 7.2.1). The following conditions should be met to be able to complete this test:

- All MCPTT clients should have downloaded their key material from KMS (see clause 7.10.1 or 7.10.4).
- All MCPTT clients should have distributed their CSK keys to the corresponding participating server by using either REGISTER or PUBLISH requests (see clause 7.10.7).

- MCPTT participating servers should have downloaded their key material from KMS (see clause 7.10.2 or 7.10.5).
- SPK keys have been configured in server pairs.
- All MCPTT clients should have obtained the GMK of the called group from the GMS (see clause 7.10.11).
- All encryption keys are derived using the corresponding methods (PRF functions for RTP/RTCP encryption and KDF functions for XML encryption) as described in [24] in each node.

A default security profile will be used for the encryption of the RTP flow as described in clause E.2.2 in [24]. The use of encrypted audio will be indicated with the use of the RTP/SAVP profile in the SDP of the initial INVITE request.

MCPTT signalling encryption is applied to the XML contents of mcptt-info body of the INVITE request that establishes the group call (see clause 7.10.14).

NOTE: If it is not possible to test the distribution of the different keys, a test with fixed keys could be considered.

Message Sequence Diagram

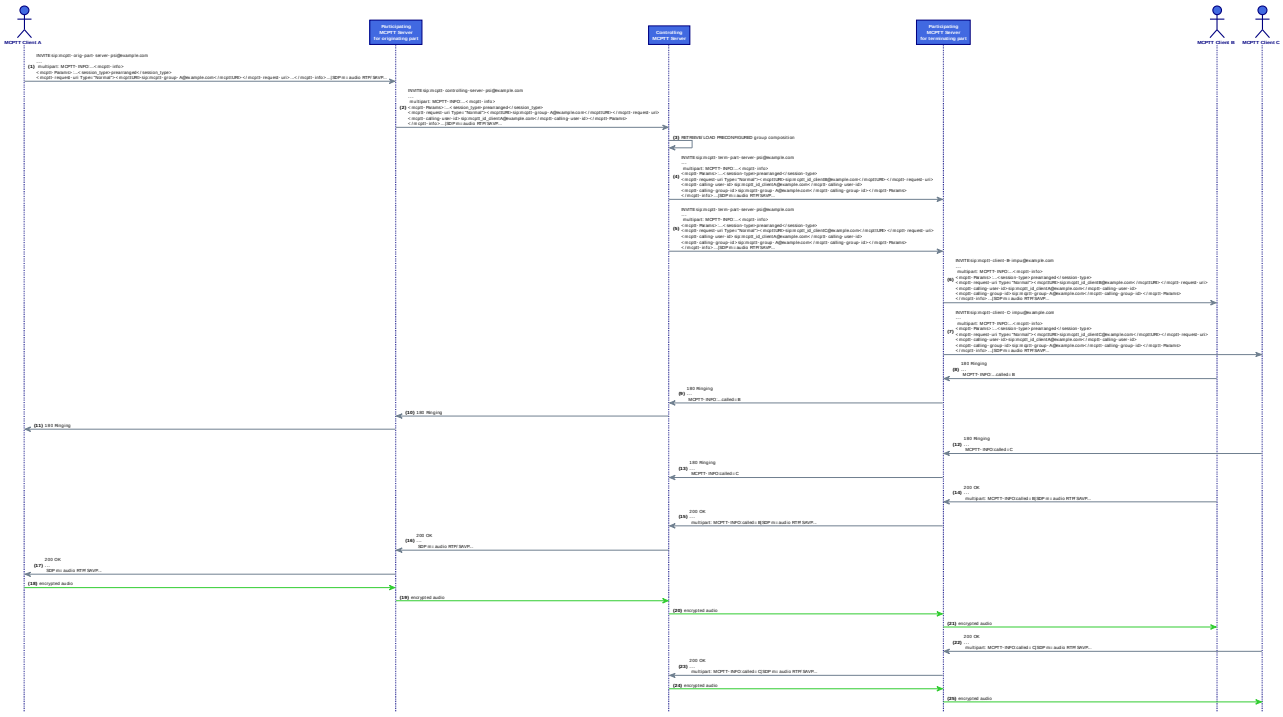

Figure 111: SEC/ENCRYPTION/GROUP/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 119: SEC/ENCRYPTION/GROUP/01 ITD

Interoperability Test Description	
Identifier	SEC/ENCRYPTION/GROUP/01
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling, group call MCPTT signalling protection and RTP/RTCP encryption
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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC, MCPTTClient_ONN-SEC-XML, MCPTT-Client, ONN-SEC-MEDIA (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTTPart_MCPTT-FC, MCPTT-Part_ONN-SEC-XML, MCPTT-Part_ONNSEC-MEDIA (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL, MCPTTCtrl_ONN-SEC-XML, MCPTT-Ctrl_ONN-SEC-MEDIA (clause 6.8)
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 • XML protection and RTP/RTCP protection has been configured in the system • GMK keys have been distributed to the clients • CSK keys have been distributed to participating servers • SPK keys have been configured per server pairs

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	SDP indicates RTP/SAVP profile and mcptt-info body is encrypted
	4	check	INVITE received at the MCPTT controlling server
	5	check	SDP indicates RTP/SAVP profile and mcptt-info body is encrypted
	6	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
	7	check	SDP indicates RTP/SAVP profile and mcptt-info body is encrypted
	8	check	"n" INVITEs received at the MCPTT participating servers of each mcptt_id_clientX (where X:1..n)
	9	check	SDP indicates RTP/SAVP profile and mcptt-info body is encrypted
	10	check	"n" INVITEs received at the affiliated mcptt_id_clientX
	11	check	SDP indicates RTP/SAVP profile and mcptt-info body is encrypted
	12	check	"n" SIP dialogs established
	13	verify	Call connected and multiple encrypted media flows exchanged

7.10.12 Encryption of MCPTT group calls using eMBMS (use of derived encryption keys from MuSIK for the floor control and MSCCK for eMBMS control) [SEC/ENCRYPTION/GROUPEMBMS/01]

This test is the continuation of the protected group call described in test case 7.10.11, but after establishing the MBMS bearers dynamically (see clause 7.6.3 or 7.6.4). The following conditions should be met to be able to complete this test:

- A protected prearranged MCPTT group call is ongoing (see clause 7.10.11).
- All MCPTT clients should have downloaded their key material from KMS (see clause 7.10.1 or 7.10.4).
- The MCPTT participating server should have downloaded its key material from KMS (see clause 7.10.2 or 7.10.5).
- All MCPTT clients should have distributed their CSK keys to the corresponding participating server by using either REGISTER or PUBLISH requests (see clause 7.10.7).
- The MCPTT participating server generates a MSCCK key for the encryption of eMBMS subchannel control packets and builds a MIKEY-SAKKE I_MESSAGE for the client as described in annex H in [24] (see note 1).
- All MCPTT clients are able to decode the MSCCK key from the MIKEY message.
- The MCPTT participating server generates a MuSiK key for the encryption of RTCP packets sent via eMBMS and distributes it as described in clause 7.10.9.
- All encryption keys are derived using the corresponding methods (PRF functions for RTP/RTCP encryption and KDF functions for XML encryption) as described in [24] in each node.

A default security profile will be used for the encryption of the RTP flow as described in clause E.2.2 in [24]. The use of encrypted audio will be indicated with the use of the RTP/SAVP profile in the SDP of the initial INVITE request.

NOTE 1: No specific clause for describing the MSCCK key distribution procedure has been included in this document. The MIKEY-SAKKE I_MESSAGE for MSCCK distribution are included in the SDP part of the SIP MESSAGE request for eMBMS bearer announcements in an "a=key-mgmt:mikey" attribute. More details on how to include this information INVITE message can be found in clauses 4.7.1 and 6.2.1 in [9].

NOTE 2: If it is not possible to test the distribution of the different keys, a test with fixed keys could be considered.

Message Sequence Diagram

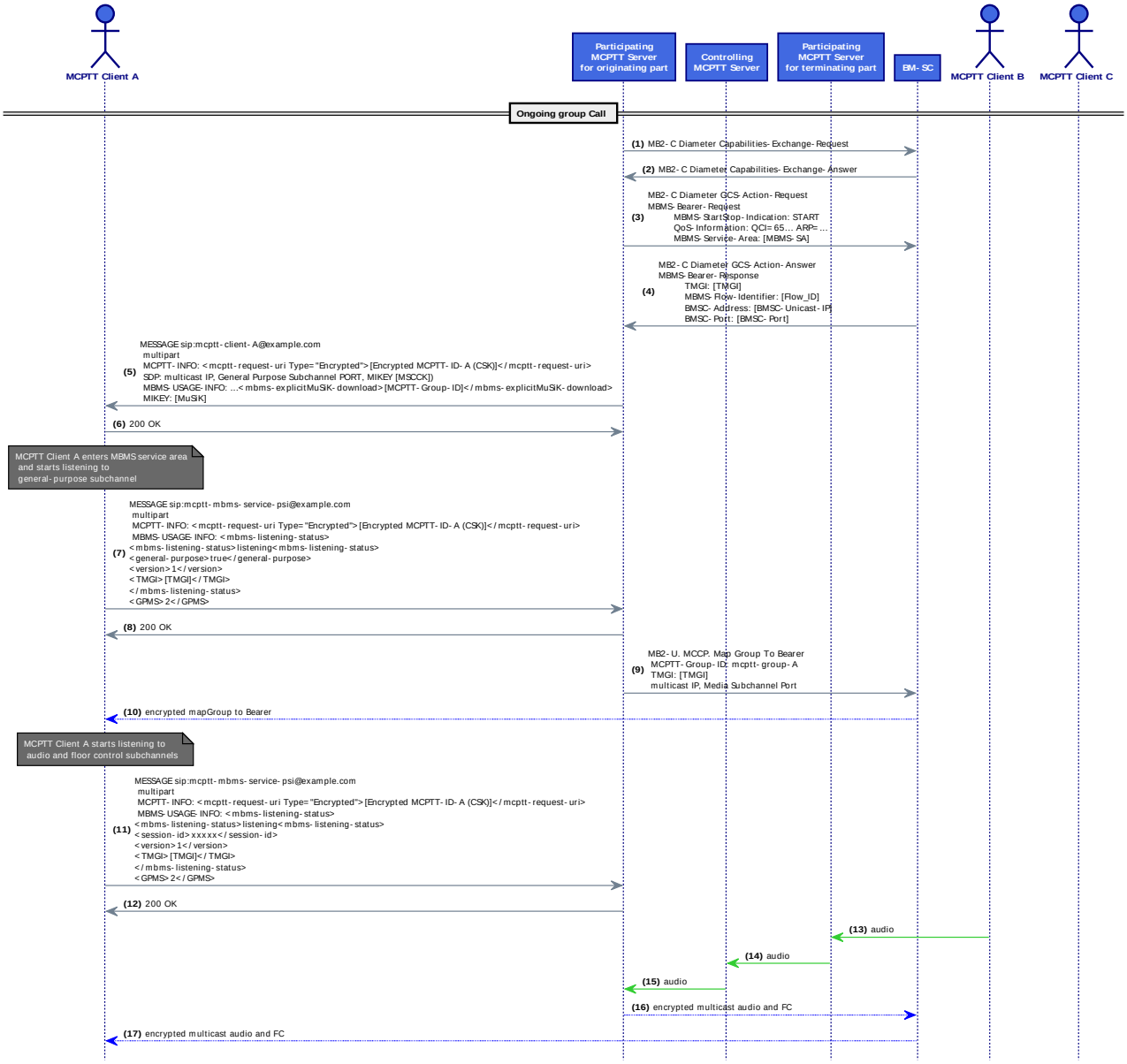

Figure 112: SEC/ENCRYPTION/GROUPEMBMS/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 120: SEC/ENCRYPTION/GROUPEMBMS/01 ITD

Interoperability Test Description			
Identifier	SEC/ENCRYPTION/GROUPEMBMS/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling		
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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC, MCPTTClient_ONN-SEC-XML, MCPTT-Client, ONN-SEC-MEDIA (clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTTPart_MCPTT-FC, MCPTT-Part_ONN-SEC-XML, MCPTT-Part_ONNSEC-MEDIA, MCPTT-Part_GCSE (CFG_ONN_MULTI-MC-LTE-1 only) (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL, MCPTTCtrl_ONN-SEC-XML, MCPTT-Ctrl_ONN-SEC-MEDIA (clause 6.8)		
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 • XML protection and RTP/RTCP protection has been configured in the system • GMK keys have been distributed to the clients • CSK keys have been distributed to participating servers • SPK keys have been configured per server pairs		
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	check	SIP MESSAGE mcptt-info body is encrypted, MSCCK key included in SDP and MuSiK key in MIKEY message
	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	Map Group To Bearer is encrypted with MSCCK
	7	check	Users successfully listening to multicast group call with encrypted audio

7.10.13 XML contents encryption in MCPTT private calls (mcptt-info and resource-lists) [SEC/XMLENCRYPT/PRIVATE/01]

This test case describes how XML encryption can be applied to the establishment procedure of MCPTT calls. It specifically analyses the case of private calls with floor control in automatic commencement mode. The same procedure with non-encrypted XML bodies can be found in clause 7.2.17 of the present document.

In order to establish a private call, the MCPTT client sends an INVITE request with the SDP, the mcptt-info body describing the type of call and a resource-lists body containing the MCPTT ID of the user it wants to contact with. The contents of the mcptt-info will be protected with MCPTT client's CSK as following xmlenc procedures as described in clause 9.3.4.2 of [24]. The callee URI contained in resource-lists body will be also protected with MCPTT client's CSK, but using the XML URI attribute encryption described in clause 9.3.4.3 of [24].

Encryption between each pair of servers is done with the previously configured SPK, whereas the information inside the final INVITE to the callee part will be encrypted with the CSK of the callee part.

The procedure to obtain the final XML encryption key from CSK and SPK keys is included in clause F.1.4 of [24].

Message Sequence Diagram

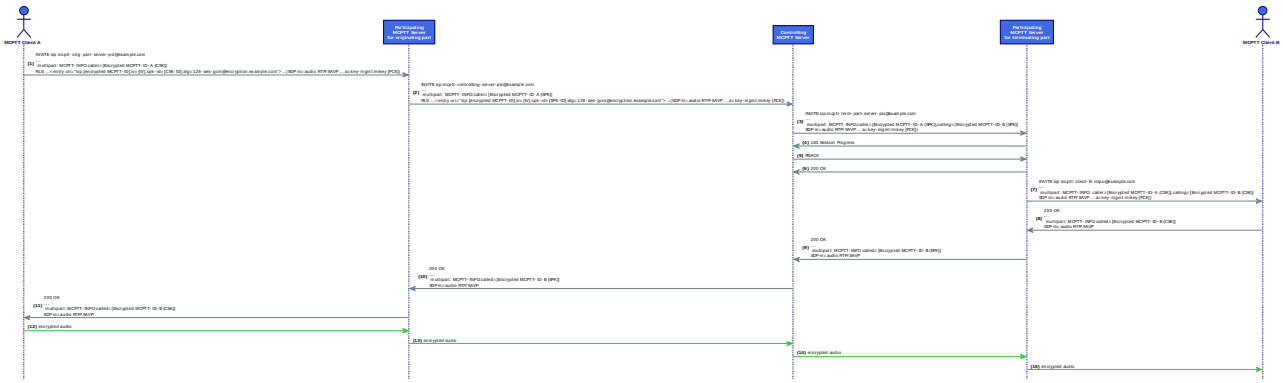

Figure 113: SEC/XMLENCRYPT/PRIVATE/01 Message Sequence

Message Details

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Trace Pending
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Interoperability Test Description

Table 121: SEC/XMLENCRYPT/PRIVATE/01 ITD

Interoperability Test Description	
Identifier	SEC/XMLENCRYPT/PRIVATE/01
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and encryption of XML contents
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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AFFIL, MCPTT- • Client_ONN-SEC-XML, MCPTT-Client_KMS (clause 6.2) • MCPTT-Part_AFFIL, MCPTT-Part_ONN-SEC-XML (clause 6.7) • MCPTT-Ctrl_AFFIL, MCPTT-Ctrl_ONN-SEC-XML (clause 6.8)
	•
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 ctrl. and part. servers • UEs properly registered to the SIP core/IMS • Client has previously obtained key material from KMS • Client's CSK has been already sent to the part. server • Shared SPK key has been already configured in servers • 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) calls User 2 (mcptt_id_clientB@example.com)
	2	check	XML contents of mcptt-info and resource-lists are encrypted with caller's CSK
	3	check	Dialog creating INVITE received at the MCPTT part.server of User1
	4	check	The part. server adapts the mcptt-info accordingly and creates an INVITE to the ctrl. server
	5	check	XML contents of mcptt-info and resource-lists are encrypted with SPK
	6	check	The ctrl. server check permissions and forward the INVITE to the part. server of the callee
	7	check	XML contents of mcptt-info are encrypted with SPK
	8	check	Upon arrival of the INVITE adapted by the terminating part. function at User 2 the call is automatically taken
	9	check	XML contents of mcptt-info are encrypted with callee's CSK
	10	verify	Call connected and media flows exchanged

7.10.14 XML contents encryption in MCPTT group calls (mcptt-info) [SEC/XMLENCRYPT/GROUP/01]

This procedure is similar to the one described in clause 7.10.13 but applied to prearranged group calls. In this case the mcptt-info body with the called MCPTT group ID will be just included. Encryption keys derived from CSKs will be used between the participating servers and MCPTT clients and those derived from SPKs between each server pair, just like in private calls. The same procedure with non-encrypted XML bodies can be found in clause 7.2.1 of the present document.

Message Sequence Diagram

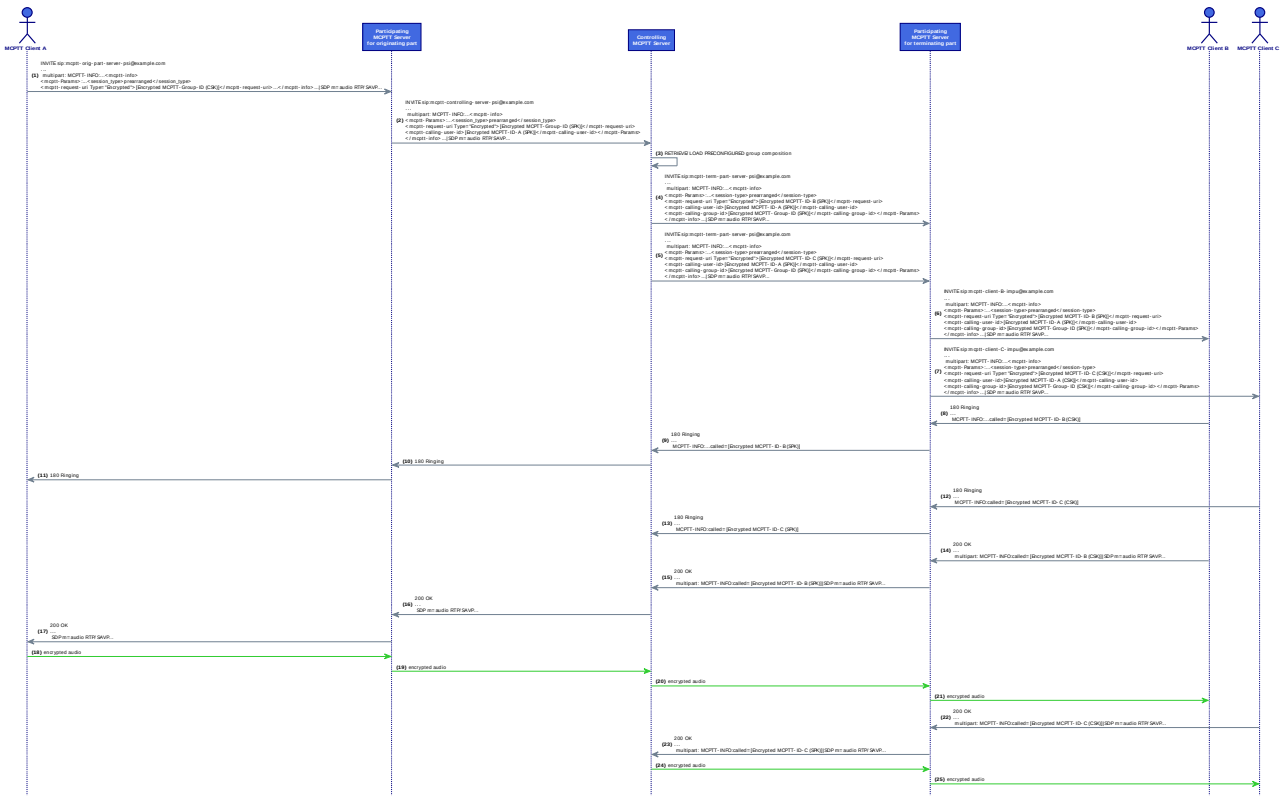

Figure 114: SEC/XMLENCRYPT/GROUP/01 Message Sequence

Message Details

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Trace Pending
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Interoperability Test Description

Table 122: SEC/XMLENCRYPT/GROUP/01 ITD

Interoperability Test Description			
Identifier	SEC/XMLENCRYPT/GROUP/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling		
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)		
	• SIP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AMR-WB, MCPTT-Client_AFFIL, MCPTT-Client_MCPTT-FC, MCPTTClient_ONN-SEC-XML, MCPTT-Client_KMS(clause 6.2) • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_AFFIL, MCPTTPart_MCPTT-FC, MCPTT-Part_ONN-SEC-XML (clause 6.7) • MCPTT-Ctrl_ONN-MCPTT-CALL, MCPTT-Ctrl_AFFIL, MCPTTCtrl_ONN-SEC-XML (clause 6.8)		
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 • Client has previously obtained key material from KMS • Client's CSK has been already sent to the participating server • Shared SPK key has been already configured in servers • 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) 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	XML contents in mcptt-info body are encrypted with CSK
	4	check	INVITE received at the MCPTT controlling server
	5	check	XML contents in mcptt-info body are encrypted with SPK
	6	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
	7	check	"n" INVITEs received at the MCPTT participating servers of each mcptt_id_clientX (where X:1..n)
	8	check	XML contents in mcptt-info body are encrypted with SPK
	9	check	"n" INVITEs received at the affiliated mcptt_id_clientX
	10	check	XML contents in mcptt-info body are encrypted with CSK
	11	check	"n" SIP dialogs established
	12	verify	Call connected and multiple media flows exchanged

7.10.15 XML contents encryption in affiliation procedure [SEC/XMLENCRYPT/AFFIL/01]

This test case describes how XML encryption can be applied to two affiliation procedures: subscription to own affiliation changes and own affiliation status change. The same procedures with non-encrypted XML bodies can be found in clauses 7.7.1 and 7.7.3 of the present document. A registered MCPTT User subscribes to its affiliation by following clauses 9.2.1.3 and 9.2.2.2.4 in [9]. The MCPTT Client sends a SIP SUBSCRIBE message setting as Request-URI the public service identity identifying the originating part. MCPTT function serving the MCPTT user and an application/vnd.3gpp.mcptt-info+xml MIME body. The contents of the application/vnd.3gpp.mcpttinfo+xml MIME body will be encrypted with MCPTT client's CSK as described in clause 9.3.4.2 in [24]. The MCPTT client will receive a NOTIFY message with the current affiliation status of the groups. If this NOTIFY message contains any affiliation information, it will be also encrypted using CSK.

After that, 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 [9]). In order to do so it will 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. Again, the contents of the application/vnd.3gpp.mcpttinfo+xml MIME body will be encrypted with MCPTT client's CSK as described in clause 9.3.4.2 in [24]. The URIs contained in application/pidf+xml body will be also encrypted with MCPTT client's CSK, but using the XML URI attribute encryption described in clause 9.3.4.3 in [24].

The MCPTT part. server will be able to decode the encrypted contents using the client's CSK. How this key is distributed to the MCPTT part. server can be found in clause 7.10.7.

SUBSCRIBE, PUBLISH or NOTIFY messages exchanged between the MCPTT ctrl. server and the MCPTT part. server will also include encrypted XML content and URI attributes, but instead of using the CSK for the encryption the servers will use a previously configured key called SPK. How this key is configured in both servers is out of scope of the MCPTT standard as stated in [24].

Message Sequence Diagram

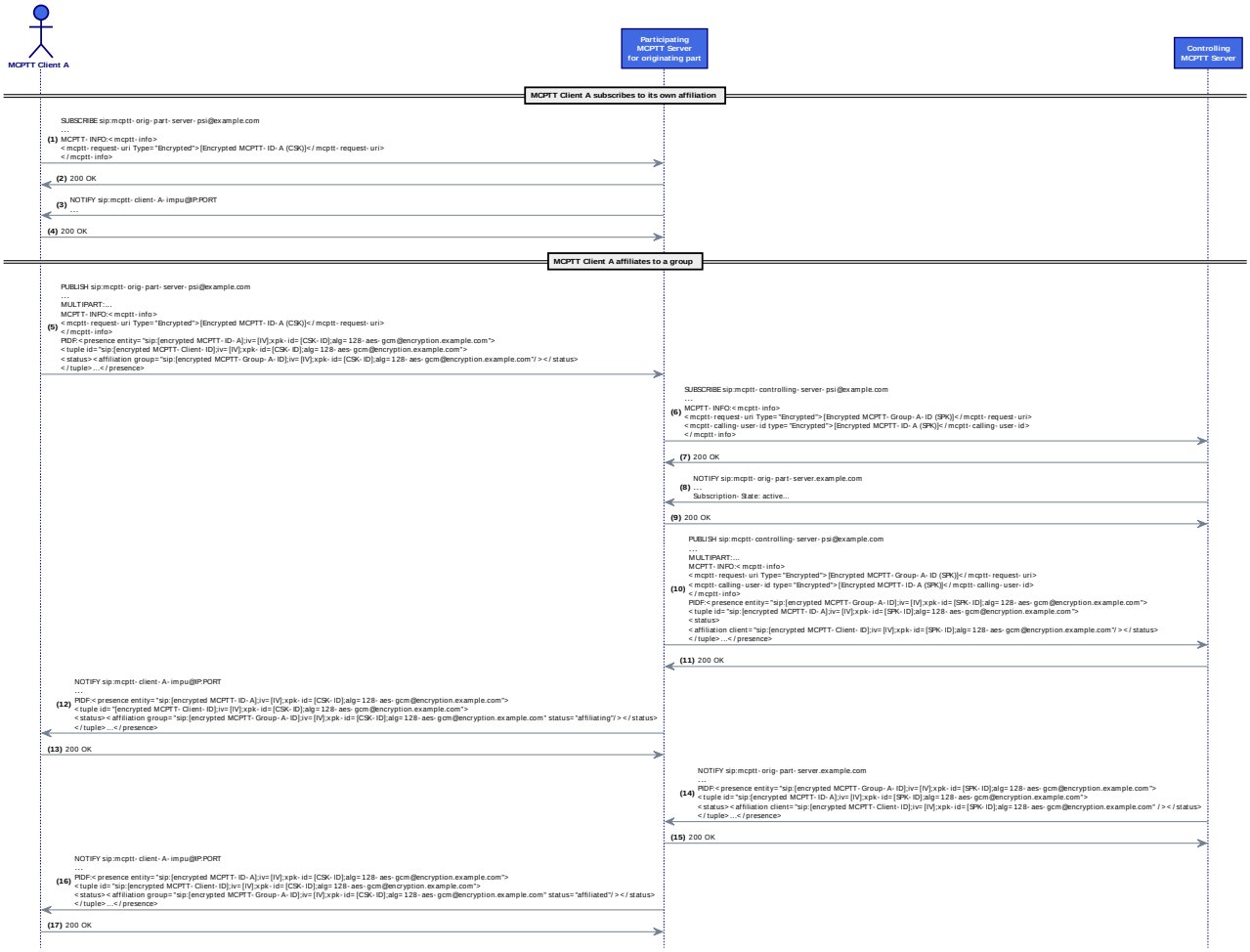

Figure 115: SEC/XMLENCRYPT/AFFIL/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 123: SEC/XMLENCRYPT/AFFIL/01 ITD

Interoperability Test Description			
Identifier	SEC/XMLENCRYPT/AFFIL/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and XML encryption		
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 [6] and other references in ETSI TS 124 379 [9]) • MCPT (see ETSI TS 124 380 [10] and other references in ETSI TS 124 379 [9]) • RTP (see ETSI TS 124 229 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_AFFIL, MCPTT- • Client_ONN-SEC-XML, MCPTT-Client_KMS (clause 6.2) • MCPTT-Part_AFFIL, MCPTT-Part_ONN-SEC-XML (clause 6.7) • MCPTT-Ctrl_AFFIL, MCPTT-Ctrl_ONN-SEC-XML (clause 6.8)		
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 ctrl. and part. servers • UEs properly registered to the SIP core/IMS • Client has previously obtained key material from KMS • Client's CSK has been already sent to the part. server • Shared SPK key has been already configured in servers • 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 part. server
	2	check	XML contents of mcptt-info are encrypted with CSK
	3	stimulus	The MCPTT originating part. server forwards the SUBSCRIBE to the ctrl
	4	check	XML contents of mcptt-info are encrypted with SPK
	5	stimulus	The MCPTT ctrl. server sends a NOTIFY related to the subscription to the part
	6	check	URI attributes of pidf body are encrypted with SPK
	7	check	Affiliation information is correctly received at the MCPTT Client upon proper NOTIFY
	8	check	URI attributes of pidf body are encrypted with CSK
	9	stimulus	User 1 (mcptt_id_clientA@example.com) sends an affiliation change (SIP PUBLISH) request to its MCPTT originating part. server with the targeted user's mcptt_id in the <mcptt-request-uri> field
	10	check	XML contents of mcptt-info are encrypted with CSK
	11	check	URI attributes of pidf body are encrypted with CSK
	12	stimulus	The MCPTT originating part. server SUBSCRIBEs to the ctrl. for the request group
	13	check	XML contents of mcptt-info are encrypted with SPK
	14	stimulus	The MCPTT ctrl. server NOTIFYes user's current status
	15	check	URI attributes of pidf body are encrypted with SPK
	16	stimulus	The MCPTT part. server PUBLISHes the new affiliation status to the request (and already) subscribed group
	17	check	XML contents of mcptt-info are encrypted with SPK
	18	check	URI attributes of pidf body are encrypted with SPK
	19	stimulus	The MCPTT ctrl. server sends a NOTIFY related to the subscription to the part
	20	check	URI attributes of pidf body are encrypted with SPK
	21	check	Affiliation information is correctly received at the MCPTT Client upon proper NOTIFY forwarding by its part
	22	check	URI attributes of pidf body are encrypted with CSK

7.10.16 XML contents encryption in location procedure [SEC/XMLENCRYPT/LOC/01]

Upon some time/distance/multicast-area related trigger, the MCPTT Client generates a Location Report. Such Report will be sent with a SIP MESSAGE request in accordance as described in clause 13.2.4 in [9]. Some fields in the Location Report will be encrypted with client's CSK key such as latitude, longitude, cell IDs, multicast area IDs, etc. How this key is distributed to the MCPTT participating server can be found in clause 7.10.7. Encryption mechanisms for XML bodies in MCPTT standard are described in clause 9.3 of [24].

Message Sequence Diagram

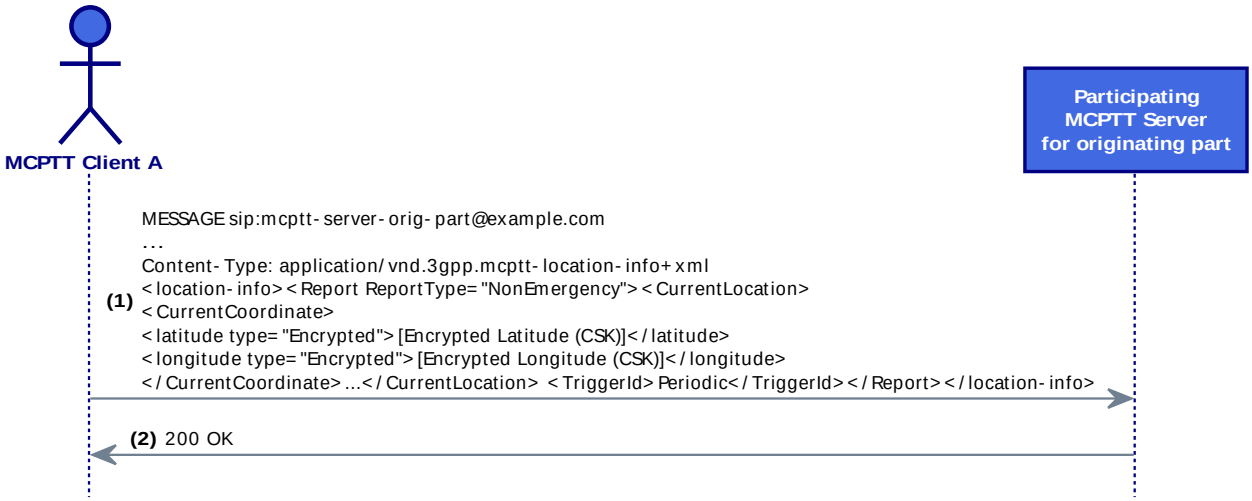

Figure 116: SEC/XMLENCRYPT/LOC/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 124: SEC/XMLENCRYPT/LOC/01 ITD

	Interoperability Test Description
Identifier	SEC/XMLENCRYPT/LOC/01
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, SIP signalling and XML encryption
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 [6] and other references in ETSI TS 124 379 [9])
Applicability	• MCPTT-Client_LOC, MCPTT-Client_ONN-SEC-XML, MCPTTClient_KMS • MCPTT-Part_LOC, MCPTT-Part_ONN-SEC-XML (clause 6.7)
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 • Client has previously obtained key material from KMS

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	check	XML of location report is encrypted with CSK
	5	verify	Location properly received and decoded in the MCPTT participating server

7.10.17 XML contents encryption in registration and authorization procedures [SEC/XMLENCRYPT/REGAUTH/01]

Assuming an IMS Core, the MCPTT Client registers and the S-CSCF sends a third-party registration. In this test case, associated diagram and message details assume 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 [9]). Additionally, the user has previously downloaded the key material from the KMS as described in clauses 7.10.1 or 7.10.4 and has generated the CSK key. The REGISTER message will contain a multipart body comprised of the mcptt-info body with the encrypted Access Token and MCPTT Client ID and a MIKEY I_MESSAGE with the encoded CSK key (see CSK key distribution procedure in clause 7.10.7). Encryption mechanisms for XML bodies in MCPTT standard are described in clause 9.3 in [24].

Message Sequence Diagram

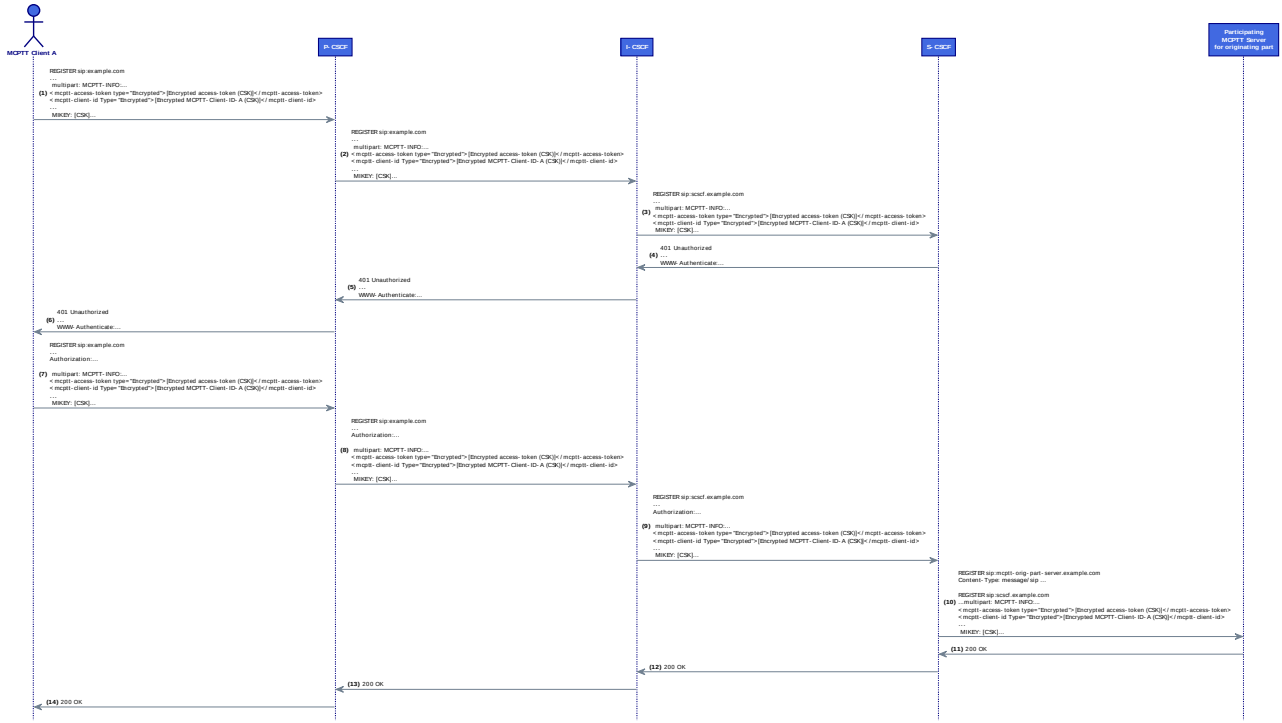

Figure 117: SEC/XMLENCRYPT/REGAUTH/01 Message Sequence

Message Details

Trace Pending

Interoperability Test Description

Table 125: SEC/XMLENCRYPT/REGAUTH/01 ITD

Interoperability Test Description			
Identifier	SEC/XMLENCRYPT/REGAUTH/01		
Test Objective	Verify IP connectivity, SIP core/IMS configuration and proper routing, 3rd party registration to the MCPTT Participating and XML encryption		
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 [6] and other references in ETSI TS 124 379 [9])		
Applicability	• MCPTT-Client_ONN-MCPTT-CALL, MCPTT-Client_REGREG, MCPTT-Client_ONN-SEC-XML, MCPTT-Client_KMS • MCPTT-Part_ONN-MCPTT-CALL, MCPTT-Part_REGAUTH, MCPTTPart_ONN-SEC-XML • 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- Client has previously obtained key material from KMS		
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	Access token and Client ID fields in mcptt-info body are encrypted with CSK key
	4	check	Body includes MIKEY I_MESSAGE with CSK key
	5	check	REGISTER sent to the S-CSCF
	6	check	S-CSCF creates a 3rd Party Register towards the participating and embeds the original REGISTER as body
	7	verify	User 1 correctly registered to the IMS Core and MCPTT participating. IMPU vs. mcptt_id binding and service authorization completed.

8 eMBMS complementary test cases

8.1 Introduction (disclaimer)

During the preparation of the test cases for the 2nd Plugtests the convenience of extensively testing eMBMS related interfaces and procedures was agreed. Such additional testing would however go beyond the overall approach followed for the rest of MCS features (even further than those test cases purely considered in 3GPP's normative TSs).

This informative clause collects a non-exhaustive list of additional eMBMS test cases that could be useful for interested eMBMS vendors and MCS server vendors. The resulting tests will not be part of the test cases officially analysed (and reported with ETSI's TRT tool) nor considered in the Plugtests statistics. Furthermore, they will not be included in any later ETSI TR or official document out of the test case documents.

Furthermore note than some of the following test cases can be (at least partially) mapped to those in clause 7.6.

8.2 Extended eMBMS test cases

8.2.1 TMGI allocation management [EMBMS-ADDITIONAL/MB2C/FUNCT/ALLOCTMGI/01]

TMGI allocation management:

- TMGI/TMGI range allocation
- TMGI expiration time renewal (free or in use)

8.2.2 TMGI deallocation management [EMBMS-ADDITIONAL/MB2C/FUNCT/DEALLOCTMGI-/01]

TMGI deallocation management:

- No TMGI IE in request -> all TMGI deallocated
- Subset of TMGI in request
- Free TMGI
- In use TMGI: bearer termination, GNR (MBMS Bearer Status Indication) sent to GCS-AS

8.2.3 Successful bearer activation [EMBMS-ADDITIONAL/MB2C/FUNCT/ACTIVATEBEARER-/01]

Successful bearer activation:

- With or without start time indication
- With or without TMGI/FlowId
- Check mandatory IEs: QoS (QCI, GBR, MBR, ARP), SAI list

8.2.4 Successful bearer deactivation [EMBMS-ADDITIONAL/MB2c/FUNCT/DEACTBEARER-/01]

Successful bearer deactivation:

- Mandatory IEs: TMGI/FlowId

8.2.5 Successful bearer modification [EMBMS-ADDITIONAL/MB2C/FUNCT/MODBEARER/01]

Successful bearer modification:

- SAI list update
- ARP (PL/PVI/PCI) update

8.2.6 Management of TMGI expiration [EMBMS-ADDITIONAL/MB2C/FUNCT/TMGIEXP/01]

TMGI expiry management:

- GNR (TMGI Expiry Notification) sent to GCS-AS

- Free TMGI
- In use TMGI: bearer termination, information provided in GNR

8.2.7 Management of aggregated requests [EMBMS-ADDITIONAL/MB2C/FUNCT/AGGREQUEST-/01]

Multiple procedures in single GAR management:

- Allocate TMGI + activate bearer
- Allocate TMGI + activate multiple bearers
- Activate + deactivate multiple bearers
- All procedures

8.2.8 Management of Bearer Pre-emption [EMBMS-ADDITIONAL/MB2C/PRIO/PREEM/01]

Bearer pre-emption management:

- Existing bearer pre-empted by newly activated bearer

8.2.9 Management of Bearer Resumption [EMBMS-ADDITIONAL/MB2C/PRIO/RESUM/01]

Bearer pre-emption management:

- Prempted bearer resumption when other bearer is deactivated

8.2.10 MB2-C security using TLS over TCP [EMBMS-ADDITIONAL/MB2C/SECURITY/TLS-/01]

MB2-C security using TLS over TCP:

- TCP MB2-C connection
- TLS not enabled
- TLS enabled with server certificate management
- TLS enabled with server + client certificate management

8.2.11 MB2-C security using DTLS over SCTP [EMBMS-ADDITIONAL/MB2C/SECURITY/DTLS-/01]

MB2-C security using DTLS over SCTP:

- SCTP MB2-C connection
- DTLS not enabled
- DTLS enabled with server certificate management
- DTLS enabled with server + client certificate management

8.2.12 Restoration procedure management [EMBMS-ADDITIONAL/MB2C/ROBUSTNESS/RES-TORATION/01]

Restoration procedure management:

- BM-SC Restart
- GCS-AS Restart
- MB2-C path failure (transient/non-transient)

8.2.13 TMGI allocation failure [EMBMS-ADDITIONAL/MB2C/ROBUSTNESS/ALLOCATE/TMGI-/01]

TMGI allocation failure:

- No more TMGI available
- Renewal of TMGI not owned by GCS-AS

8.2.14 TMGI deallocation failure [EMBMS-ADDITIONAL/MB2C/ROBUSTNESS/DEALLOCATE/TMGI/01]

TMGI deallocation failure:

- TMGI not owned by GCS-AS

8.2.15 Bearer activation failure [EMBMS-ADDITIONAL/MB2c/ROBUSTNESS/ACTIVATE/BEARER-/01]

Bearer activation failure:

- Wrong QoS values
- Missing mandatory IE (QoS, SAI list)
- Unknown SAI for PLMN - If TMGI provided:
  - Unknown TMGI/FlowId
  - Already used FlowId
- SAI overlap with other bearer using same TMGI - If TMGI not provided:
  - No TMGI available
  - Not enough radio resources

8.2.16 Bearer deactivation failure [EMBMS–ADDITIONAL/MB2C/ROBUSTNESS/DEACTIVATE-/BEARER/01]

Bearer deactivation failure:

- Missing mandatory IE (TMGI/FlowId)
- Unknown bearer (TMGI/FlowId)

8.2.17 Bearer modification failure [EMBMS-ADDITIONAL/MB2C/ROBUSTNESS/MODIFY/BEARER-/01]

Bearer modification failure:

- Missing mandatory IE (TMGI/FlowId + ARP or SAI list)
- Unknown bearer (TMGI/FlowId)
- Unknown new SAI
- SAI overlap with other bearer for new SAI

8.2.18 Multiple GCS-AS management [EMBMS-ADDITIONAL/MB2C/LOAD/MUL-TIPLEGCS-/01]

Multiple GCS-AS management:

- Two GCS-AS connected to same BM-SC
- Same or different PLMN
- Check all MB2-C procedures (alloc/dealloc TMGI, activate/deactivate/modify bearer) run properly for each GCS-AS

8.2.19 Activation of multiple (100) bearers [EMBMS-ADDITIONAL/MB2C/LOAD/100BEARER-/01]

Activate 100 bearers simultaneously (10 per second during 10 seconds):

- No error occurs

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)", 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)", March 2016.
- ETSI TS 129 283 (V14.3.0): "LTE; Universal Mobile Telecommunications System (UMTS); Diameter data management applications (3GPP TS 29.283 version 14.3.0 Release 14)".
- ETSI TS 123 468 (V14.0.0): "LTE; Group Communication System Enablers for LTE (GCSE-LTE); Stage 2 (3GPP TS 23.468 version 14.0.0 Release 14)".
- ETSI TS 124 483 (V14.3.0): "LTE; Mission Critical Services (MCS) Management Object (MO) (3GPP TS 24.483 version 14.3.0 Release 14)".

History

Document history		
V1.1.1	October 2017	Publication
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