

TS.11- Annex N

Detailed Test Procedures for Mission Critical services Version 41

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**Annex H Glossary**

*Editor’s note: The following terms and abbreviations should be added to Annex H:*

|  |  |
| --- | --- |
| **Term** | **Description** |
| CAS/PAS | Controlling / Participating (MCPTT) Server |
| CF | Controlling Function (MCPTT) Server |
| CMS | Configuration Management Server |
| CSC | Common Service Core |
| CSCF | Call Server Control Function |
| DUT/DUTs | Device or Devices Under Test |
| Entity | An Entity is reference to a MCS User and MC UE |
| GMS | Group Management Server |
| GMK | Group Management Key |
| IdM Client/IdMC | Identity Management Client |
| IdMS | Identity Management Server |
| IMPU | IP Multimedia PUblic Identity |
| IMS | IP Multimedia Subsystem |
| K-ID | Key Identifier |
| KMS | Key Management Server |
| LTE/4G | Long Term Evolution - this is a reference to the the 4th Generation of cellular technology |
| MCS | Mission Critical System |
| MCX | Mission Critical Services – where the X refers to Push to Talk, Video or Data |
| MCX UE | Mission Critical Service User Equipment |
| MCPTT | Mission Critical Push to Talk |
| MCData | Mission Critical Data |
| MCVideo | Mission Critical Video |
| MEA | MCPTT Emergency Alert state |
| MEG | MCPTT Emergency Group state |
| MEGC | MCPTT Emergency Group Call state |
| MIG | MCPTT Imminent Peril Group state |
| MIGC | MCPTT Imminent Peril Group Call state |
| MIKEY-SAKKE | Sakai-Kasahara Key Encryption in Multimedia Internet KEYing (see RFC 6509) |
| O-PF | Originating Participating Function (MCPTT) Server |
| PTT | Push To Talk |
| P-CSCF | Proxy Call Server Control Function |
| RTP | Real-time Transport Protocol |
| S-CSCF | Serving Call Server Control Function |
| SIP | Session Initiated Protocol |
| T-PF | Terminating Participating Function (MCPTT) Server |
| URI | Uniform Resource Identifier |

# Annex N: Detailed Test Procedures for Mission Critical services

This Annex contains the detailed procedures that are recommended to be used for Field and Lab Tests of mission critical services.

# 110 Mission Critical Push To Talk (MCPTT)

## 110.1 Registration

### 110.1.1 Mission Critical Bearer Setup

*Editor’s note: not available yet*

### 110.1.2 User Authentication

**Description**

The purpose of this test is to validate the successful user authentication including a successful MCX (using PTT placeholder for DATA, Video) Client registration:

**Applicability**

3GPP MCS Rel. 15 or later

**Related core specifications**

3GPP TS 33.102, 5.1.2

3GPP TS 33.401, 6.1

3GPP TS 33.179

3GPP TS 33.180

**Reason for test**

To verify that device under test (DUT) successfully initiates user authentication and network authentication service registration. It is assumed that entity authentication should occur at each connection set-up between the user and the network.

MCX Client switches on, can access IDMS and run authentication mechanism successfully

**Initial configuration**

Components:

* DUT: mobile device with Client App
* IdMS
* MS core, Network and Cell
* DUT has a MCX capable application
* DUT is switched off
* DUT has valid SIM for test network
* Minimum is that connectivity should be established between all elements of the specific scenario (and tested prior this case)
* The IdMS shall have the MC User, Service and Credential pre-provisioned and authentication must be performed over the CSC-1 reference point (between the IdM Client and IdM Server)
* (The CSC-1 shall consist of two endpoints; the authorization endpoint and token endpoint.)
* Authentication is performed using Open Id Connect 1.0

**Test procedure**

|  |  |  |
| --- | --- | --- |
| **-** | **Test procedure** | **Expected behaviour** |
| 1 | Power on DUT and confirm successful attach procedure. | DUT registers – after contacting the network to get the subscriber data and authentication data – successfully on Cell of a (home) network. |
| 2 | Open MCX Client Application. | Authentication Request will appear  Network service is indicated on the display on DUT with MCX Client Application |
| 3 | Log into the MCX Application using a valid account (Username and Password). | MCX User successfully authenticates (and is authorized to use its MCX services)   * that includes token is requested by MCX client * User is verified and data and identity token are correctly received according ETSI TS 124 482 * Following Service Authorisation test case: functions available with the user (rights) are appearing  (to be defined)   Background activities coming with this test on IMS Core: MCPTT Client Registers & S-CSCF send 3rd party registration, after MCPTT User has already authenticated with IdMS |

**Example message flow for MCX User authentication to IdMS:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **Direction DUT - NW** | **Message** | **Comments** |
| User Registration | | | |
| 1 | --> | MCX User send authorisation request to IdMS |  |
| 2 | <-- | IdMS redirects Authorisation mechanism |  |
| 3 | --> | MCX User sends Token Request |  |
| 4 | --> | IdMS sends Token Response |  |

### 110.1.3 Service Authorisation

**Description**

The purpose of this test is to validate the successful service registration and authorisation.

**Applicability**

3GPP MCS Rel. 15 or later

**Related core specifications**

3GPP TS 33.102, 5.1.2

3GPP TS 33.401, 6.1

3GPP TS 33.179

3GPP TS 33.180

**Reason for test**

To verify the successful execution of at least one of the 3 following mechanisms for service registration and authorisation.

1. MCX User authorised via IdMS
2. MCX User authorised via 3rd party registration
3. MCX User authorised using PUBLISH mechanism

**Initial configuration**

DUT: mobile device with MCX client App

IdMS

For scenario b and c need IMS core, and transportation network and Cell

MCX Client has valid SIM in network (if network is needed), minimum is that IP Connectivity should be established between all elements of the specific scenario, e.g. Access of IdMS via APN and tunnel mechanism

For c SIP PUBLISH based service authorization mechanism must be available

**Test procedure**

**Scenario A: Service Authorisation via IdMS** (Preconditions: access and identity tokens are available)

|  |  |  |
| --- | --- | --- |
| **-** | **Test procedure** | **Expected behaviour** |
| 1 | Access IdMS (CMS URL; hardcoded) and proceed. | Proceed (Crossref) User Authentication – Service allocation is inherited. |
| 2 | Open MCX Client Application. | Authentication Request will appear  Network service is indicated on the display on UE with MCX Client Application |

**Scenario B: Service Authorisation via 3rd party registration**

|  |  |  |
| --- | --- | --- |
| **-** | **Test procedure** | **Expected behaviour** |
| 1 | Register with IMPU and MCX (PTT) specific information mcptt-Info | * REGISTER to P-CSCF * REGISTER to S-CSCF * S-CSCF creates 3rd party Register + original REGISTER as body |
| 2 | User registers to IMS Core and MCX Participating (IMPU or mcptt\_id binding). | Service authorisation completed (visible on device) |

**Scenario C: Service Authorisation via PUBLISH mechanism**

|  |  |  |
| --- | --- | --- |
| **-** | **Test procedure** | **Expected behaviour** |
| 1 | Register with IMPU and MCX (PTT) specific information mcptt-Info | * REGISTER to P-CSCF * REGISTER to S-CSCF * S-CSCF creates 3rd party Register + original REGISTER as body |
| 2 | After successful user authentication at IdMS, check that the MCX Client sends PUBLISH including poc-settings and mcptt\_info with the credentials. | * User registers to IMS Core and MCX Participating (IMPU or mcptt\_id binding) * Service authorisation completed (visible on device) |

## 110.2 Group Call, pre-arranged, on-demand

### 110.2.1 Normal Group Call

**Description**

The DUT (with MCX client application) shall successfully perform the “Normal Group Call” and “Termination of Normal Group Call” procedures to MCX server.

**Applicability**

3GPP Rel. 15 or later

**Related core specifications**

3GPP TS 33.180

3GPP TS 23.379

3GPP TS 24.379

**Reason for test**

To verify the DUT can successfully establish Normal Group Call between different users and Termination of Normal Group Call

**Initial configuration**

The DUT, Client B and Client C MCX devices are assigned to a common group.

All devices have successfully performed User Authentication and been assigned a valid Token.

The DUT is authorised to initiate a Group call.

There are no group Emergency or Imminent Peril calls in progress.

**Test procedure**

**Scenario A: Normal Group Call**

|  |  |  |
| --- | --- | --- |
| **-** | **Test procedure** | **Expected behaviour** |
| 1 | Select a PTT group. | The group can be selected |
| 2 | Press the PTT button to initiate a group call. | Group Call request → MCPTT Server  OPTIONAL: Resolve MCPTT Group X ID→ Group Management Server  MCPTT Server → Group Call request to MCPTT Client B MCPTT Server → Group Call request to MCPTT Client C Waiting for permission to start a group call  MCPTT Client B → Group Call response  MCPTT Client C → Group Call response  Group management Server grants access to group X and the group call starts  Media plane and floor control establishment |
| 3 | Check that an audio connection has been established with the PTT group. | The voice connection works to B and C |
| 4 | Press the PTT button to release the group call. | MCPTT Server: Generate group call release  Group Call release request to MCPTT Client B and MCPTT Client C (Notify user)  Group Call release response of MCPTT Client B and MCPTT Client C  Releasing floor control and media plane resources associated with group call  The group call ends |

**Example message flow:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **Direction DUT - NW** | **Message** | **Comments** |
| Normal Group Call | | | |
| 1 | --> | A send group INVITE to the server |  |
| 2 | <-- | The server send INVITE to B and C |  |
| 3 | --> | B send ringing and OK to the server |  |
| 4 | --> | C send ringing and OK to the server |  |
| 5 | <-- | The server send OK to A |  |
| 6 | --> | A send audio to the server |  |
| 7 | <-- | The server send audio to B and C |  |
| Termination of Normal Group Call | | | |
| 8 | --> | A send BYE to server |  |
| 9 | <-- | Server send OK to A |  |
| 10 | <-- | Server send Disconnect to B and C |  |
| 11 | --> | B send ACK to server |  |
| 12 | --> | C send ACK to server |  |

**Scenario B: Normal Group Call (time out)**

|  |  |  |
| --- | --- | --- |
| **-** | **Test procedure** | **Expected behaviour** |
| 1 | Select a PTT group. | The group can be selected |
| 2 | Press the PTT button to initiate a group call. | Waiting for permission to start a group call  Server grants access to a group and the group call starts |
| 3 | Check that an audio connection has been established with the PTT group. | The voice connection works to B and C |
| 4 | Speech item time out. | The group call ends |

**Example message flow:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **Direction DUT - NW** | **Message** | **Comments** |
| Normal Group Call | | | |
| 1 | --> | A send group INVITE to the server |  |
| 2 | <-- | The server send INVITE to B and C |  |
| 3 | --> | B send ringing and OK to the server |  |
| 4 | --> | C send ringing and OK to the server |  |
| 5 | <-- | The server send OK to A |  |
| 6 | --> | A send audio to the server |  |
| 7 | <-- | The server send audio to B and C |  |
| Termination of Normal Group Call | | | |
| 8 | --> | Server send Disconnect to A, B and C |  |
| 10 | --> | A send ACK to server |  |
| 11 | --> | B send ACK to server |  |
| 12 | --> | C send ACK to server |  |

**Scenario C: Normal Group Call (toggle mode)**

|  |  |  |
| --- | --- | --- |
| **-** | **Test procedure** | **Expected behaviour** |
| 1 | Select a PTT group. | The group can be selected |
| 2 | Press the PTT button and release it. | Waiting for permission to start a group call  Server grants access to a group and the group call starts |
| 3 | Check that an audio connection has been established with the PTT group. | The voice connection works to B and C |
| 4 | Press the end-call button. | The group call ends |

**Example message flow:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **Direction DUT - NW** | **Message** | **Comments** |
| Normal Group Call | | | |
| 1 | --> | A send group INVITE to the server |  |
| 2 | <-- | The server send INVITE to B and C |  |
| 3 | --> | B send ringing and OK to the server |  |
| 4 | --> | C send ringing and OK to the server |  |
| 5 | <-- | The server send OK to A |  |
| 6 | --> | A send audio to the server |  |
| 7 | <-- | The server send audio to B and C |  |
| Termination of Normal Group Call | | | |
| 8 | --> | A send BYE to server |  |
| 9 | <-- | Server send OK to A |  |
| 10 | <-- | Server send Disconnect to B and C |  |
| 11 | --> | B send ACK to server |  |
| 12 | --> | C send ACK to server |  |

### 110.2.2 Emergency Group Call

**Description**

In this test case a MCPTT user initiates an MCPTT emergency group call with affiliated MCPTT members of that MCPTT group. The initiating MCPTT client gains elevated access privilege over other MCPTT clients and resources that are in normal state of operation. In this test case all affiliated MCPTT clients are in idle mode.

The initiation of a MCPTT emergency group call puts the MCPTT group into the in-progress emergency state.by the MCPTT server until the in-progress emergency state of the MCPTT group is cancelled.

This test case will require a minimum of three MCPTT clients which are all on the same MCPTT server and Group Management Server (GMS) and are affiliated, and active on the same MCPTT Group.

**Applicability**

3GPP MCS Rel.15 or later

**Related core specifications / References**

3GPP TS 23.379

3GPP TS 24.379

3GPP TS 24.481

**Reason for test**

To verify that the DUT can successfully establish a MCPTT Emergency Group Call and provide priority access to the requesting DUT over a Normal Group Call that may be in progress.

**Initial configuration**

The following pre-conditions are applied for this test case:

1. Three MCX DUTs are connected via an core network using the process as defined in 3GPP TS 33.401.
2. The MCX DUTs are all switched on and have been authorised/authenticated and assigned to a common group.
3. The Requesting DUT and Receiving DUTs are reachable on the Home KMS and Access Network.
4. Functions of the MCPTT server (Originating Participating/Controlling/Terminating Participating MCPTT Function) and all MCPTT DUTs are located in the primary MCPTT system.
5. A pre-arranged group is established with a common MCPTT group ID and member list on the same Group Management Server (GMS).
6. The MCPTT User Profile will have the following parameters set:
   1. Allow-emergency-group-call = true
7. The MCPTT service setting for ruleset actions Allow-Automatic-Commencement= false.
8. Initial configuration of each DUTs under test will be:
   1. MCPTT Emergency state = clear
   2. MCPTT Emergency Group (MEG) state = MEG 1: no-emergency
   3. MCPTT Emergency Group Call (MEGC) state = MEGC: emergency-gc-capable
   4. MCPTT Emergency Alert (MEA) state= no-alert
9. The Controlling MCPTT function characteristics will be:
   1. In-progress emergency group state = false
10. The DUT User Profile shall be identified as being authorized with the following configuration:
    1. allow-emergency-group-call = true
    2. MCPTTGroupInitiation = DedicatedGroup or UseCurrentlySelectedGroup
11. Three DUTs are used in this test case and each will have MCPTTGroupPriority Hierarchy as follows:
    1. DUT-1: MCPTTGroupPriority Hierarchy=4
    2. DUT-2: MCPTTGroupPriority Hierarchy=5
    3. DUT-3: MCPTTGroupPriority Hierarchy=6
12. The minimumReportInterval timer is set to notify the current location when a DUT is in a MCPTT emergency group call

**Test Procedure**

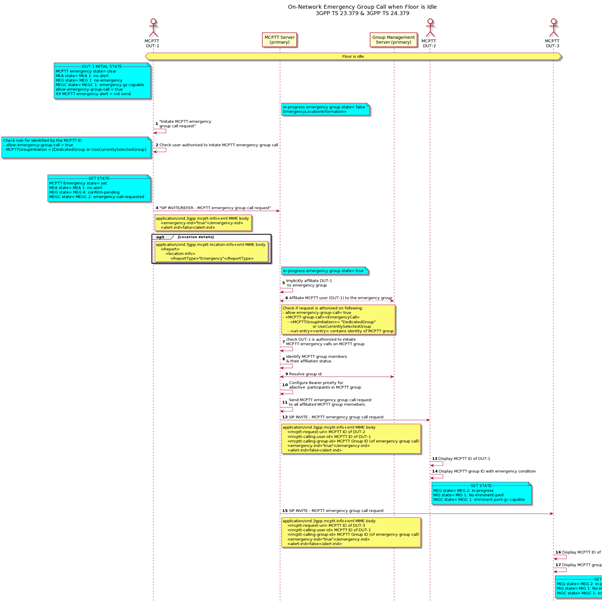
**Scenario A: Emergency Group Call with Idle floor**

| **-** | **Test procedure** | **Expected behaviour** |
| --- | --- | --- |
| 1 | Start condition | Floor is idle for all DUTs |
| 2 | DUT-1    DUT-1 initiates an Emergency Group Call on their MCPTT device | For DUT-1 the MCPTT client checks if the user is authorized to initiate a MCPTT emergency group call if their profile has:  - <mcptt-client-id> shall be identity of DUT-1 user  - <allow-emergency-group-call> = true, &  - MCPTTGroupInitiation = [DedicatedGroup or UserCurrentlySelectedGroup]    Following successful authorization for DUT-1 the following status attributes value are set as follows:  - MCPTT emergency state= set  - MEG state= MEG 4: confirm-pending  MEGC state= MEGC 2: emergency-call-requested |
| 3 | DUT-1 à MCPTT Server    DUT-1 sends MCPTT emergency group call request to the MCPTT Server | DUT-1 sends a SIP INVITE or REFER message to the MCPTT Server. This shall include in the application/vnd.3gpp.mcptt-info+xml MIME body the following:  - <emergency-ind> element set to “true”  - <alert-ind> element set to “false”  - MEA state= MEA 2: emergency-alert-confirm-pending  Shall include in the application/vnd.3gpp. mcptt-location-info+xml MIME body the current location information of DUT-1 with the following details:  - <location-information> <Configuration> <EmergencyLocationInformation> <Report>  - <ReportID>  - <RequestID>  - <TriggerID>  - <CurrentLocation> |
| 4 | MCPTT Server    Affiliation status determination for DUT-1 | On receiving the SIP INVITE/REFER, the MCPTT server, it will determine the affiliation status of DUT-1, by checking the following:  - MCPTT user information,  - MCPTT client information,  - MCPTT group information & affiliation status,  As defined in 3GPP TS 24.279 clause 9.2.2.2.11. |
| 5 | MCPTT Server  Check if DUT-1 user request is authorised | Check from the originating SIP message the following:  - <EmergencyAlert><entry><entry-info> set to “DedicatedGroup” or “UseCurrentlySelectedGroup”  For the MCPTT Group set:  <allow-emergency-group-call> value to “true”. |
| 6 | Verify MCPTT Initiating DUT-A client is authorised | Query the GMS and check the ruleset for the following:   * common/ruleset/rule/id{i}/ actions/Allow-Emergency-Group-Call= true * common/MCPTT-group-call/EmergencyCall/MCPTTGroupInitiation/entry= DedicatedGroup * common/MCPTT-group-call/EmergencyCall/MCPTTGroupInitiation/entry/uri-entry = [TBD] * identify the active MCPTT Clients & DUTs affiliated with the initiating MCPTT Group.   The following attributes are configured for the MCPTT Group:   * in-progress emergency group (IPEG) state = true   [Ref: TS24.379 clause 6.3.2.1.8.1 (1)] |
| 7 | MCPTT Server    Verify that auto commencement mode is set | Verify that common/ruleset/rule/id{i}/actions/ Allow-Automatic-Commencement=true |
| 8 | MCPTT Server à DUT-2  MCPTT Server à DUT-3    SIP INVITE for emergency call to each Terminating MCPTT DUT (DUT-B & DUT-C) affiliated to the MCPTT Group. | The SIP INVITE application/vnd.3gpp.mcptt-info+xml MIME body will contain the:   * <mcptt-request-uri> identifies the MCPTT ID of the terminating (DUT-2 or DUT-3) * <mcptt-calling-user-id> identifies MCPTT ID of DUT-1 * <mcptt-calling-group-id> identifies the MCPTT Group ID of the emergency group call * <emergency-ind> is set to “true” * <alert-ind> is set to “false”   Optionally if location details are supported the ‘application/vnd.3gpp.mcptt-location-info+xml MIME’ will contain the following:   * <location-info><Report> * <ReportType>Emergency</ReportType> * <Configuration><EmergencyLocationInformation> <CurrentLocation> |
| 9 | DUT-2  DUT-3    Validate and accept terminating MCPTT emergency group call SIP INVITE/REFER request | Check if terminating DUT-2 or DUT-3 is already in MCPTT emergency call or the maximum number of emergency calls are already in progress, if not then perform the following:    Display on terminating DUT-2 & DUT-3 the following:  - MCPTT ID of DUT-1  - MCPTT group ID with emergency condition    Set status on termination DUT-2 & DUT-3 as follows:  - MEG state= MEG 2: in-progress  - MIG state= MIG 1: no-imminent-peril  - MIGC state= MIGC 1: imminent-peril-gc-capable |
| 10 | DUT-2 à MCPTT Server  DUT-3 à MCPTT Server    SIP 200 (OK) response to accept terminating MCPTT emergency call request | Terminating DUT-2 & DUT-3 accept MCPTT emergency group call by responding with a SIP 200 (OK) message. |
| 11 | MCPTT Server à DUT-1  SIP 200 (OK) response to DUT-1 to accept originating MCPTT emergency call request | Originating DUT-1 MCPTT emergency group call is accepted and the following states are updated for the MCPTT user:  - MEG state= MEG 2: in-progress  - MEGC state: MEGC 3: emergency-call-granted  - MIGC state= MIGC 1: imminent-peril-capable  - MIG state= MIG 1: no-imminent-peril |
| 12 | DUT-1    Granted Floor Control | DUT-1 is granted floor control and the MCPTT client will notify the MCPTT user by playing a Permission Initiation tone |
| 13 | DUT-1 à MCPTT Server  MCPTT Server à DUT-2 &  MCPTT Server à DUT-3    RTP Voice Media plane established | DUT-1 presses the PTT button to speak and a RTP Voice Media plane is established to all active and affiliated members of the MCPTT Emergency Group call. |

**Example message flow:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **Direction DUT - NW** | **Message** | **Comments** |
| Emergency Group Call with Idle floor | | | |
| 1 | -- > | DUT-1 sends SIP INVITE for MCPTT emergency group call |  |
| 2 | <-- | MCPTT Server sends SIP INVITE to DUT-2 for MCPTT emergency group call |  |
| 3 | <-- | MCPTT Server sends SIP INVITE to DUT-3 for MCPTT emergency group call |  |
| 4 | --> | DUT-2 sends SIP 200 (OK) response to MCPTT Server |  |
| 5 | --> | DUT-3 sends SIP 200 (OK) response to MCPTT Server |  |
| 6 | <-- | MCPTT Server sends SIP 200 (OK) to DUT-1 |  |
| 7 | --> | DUT-1 sends audio to MCPTT Server |  |
| 8 | <-- | MCPTT Server sends audio to DUT-2 & DUT-3 |  |

**Details flow sequence diagram:**



### 110.2.3 Imminent Peril Group Call

*Editor’s note: not available yet*

### 110.2.4 Broadcast Call

*Editor’s note: not available yet*

### 110.2.5 Upgrade of call in progress to emergency or imminent peril call

*Editor’s note: not available yet*

### 110.2.6 Floor Control

For the floor control tests we will use specific test configuration for the Devices Under Test (DUT) and the baseline configuration that will be applied across the various test scenarios identified is identified in this section. Here the configuration varies across each test case this will be indicated in each test scenario as appropriate.

#### 110.2.6.1 On-Network Floor Control - Talk/Media Burst - when floor is Idle

**Description**

On-Network, Pre-arranged group establishment for an on-demand Group Call for basic Talk/Media Burst, where the Floor is identified as being idle.

In this test case we have 3 MCX DUTs, of which one is the Initiating DUT that will initiate a floor control request and we will have two Participating DUTs. All three DUTs are active and in the same MCS Group (MCS). The initiating DUT (MCPTT Client A) will initiate a Talk Burst/Media Burst Group call and the Participating DUTs will be notified of the Floor Control progress and session as the group call is set up.

**Applicability**

3GPP MCS Rel.15 or later

**Related core specifications / References**

The following references were used in the development of this test case:

3GPP TS 24.379

3GPP TS 24.380

3GPP TS 24.483

3GPP TS 24.484

**Reason for test**

Verify the MCPTT service is able to establish a successful Floor Control session between multiple participating DUTs in the same Group Call

To verify that a MCPTT Emergency Group Call can be established and provide priority access to the requesting Entity.

**Initial configuration**

The following pre-conditions are applied for this test case:

1. Floor request is initiated when the floor is idle.

2. Multi-Talker Groups are not considered in the test case.

3. No Acknowledgement response messages are required to be sent by the DUTs for the Floor Control messages they receive.

4. Dual Floor Control or Multi-Talker Group will not be applied by the Floor Control Server.

5. Floor Request Queueing is set to “false” on the Floor Control Server.

6. Floor Request Pre-emptive Priority is set to “false”

7. The type of Group Call is identified as a Normal Group Call.

8. The Floor priority for the DUTs is identified as follows:

a. DUT-1: Floor Priority = 10

b. DUT-2: Floor Priority = 10

c. DUT-3: Floor Priority = 10

9. The timers that are configured for each DUT are identified as follows:

a. T100 (Floor Release) = 3S

b. T101 (Floor Request) = 3S

c. T103 (End of RTP media) = 2S

d. T104 (Floor Queue Position Request) = 3S

e. T132 (Queued Request Granted) = 2S

10. The MCS Service Configuration will be common to all DUTs and these parameters are configured as follows:

a. Floor Control Queue – depth = 4

b. Floor Control Queue – max-user-request-time= 30S

c. T1-end-of-rtp-media = 4S

d. T3-stop-talking-grace = 3S

e. T7-floor-idle = 4S

f. T8-floor-revoke = 1S

g. T11-end-of-RTP-dual = 4S

h. T12-stop-talking-dual = 30S

i. T15-conversation = 30S

j. T16-map-group-to-bearer = 0.5S

k. T17-unmap-group-to-bearer = 0.2S

l. T20-floor-granted = 1S

m. T55-connect = 2S

n. T56-disconnect = 2S

o. C7-floor-idle = 10

p. C17-unmap-group-to-bearer = 3

q. C20-floor-granted = 3

r. C55-connect = 3

s. C56-disconnect = 3

**Test procedure**

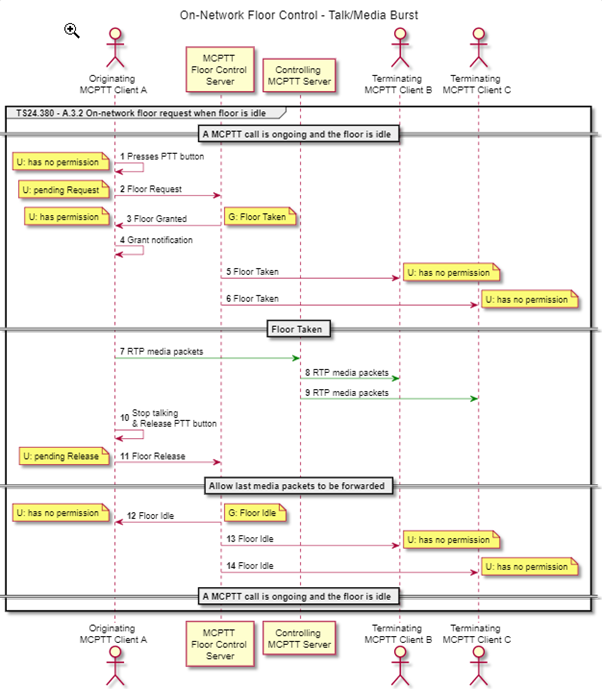
**Scenario A: Normal Floor Request Process initiated with Idle floor**

| **Step** | **Direction** | **Message** | **Comments** |  |
| --- | --- | --- | --- | --- |
| 1-2 | DUT1  →  MCPTT Floor Control Server | Floor Request message | DUT1 initiates a MC PTT floor request session by pressing the PTT Button on their device (and keeping it pressed for the duration of the communication needed).  The MCPTT Floor Control Server identifies that the floor is idle (no ongoing sessions are in progress) & verifies that DUT1 is authorised and permits the request.  ● DUT1 State Change: [U: Has No Permission] à [U: Pending Request] |  |
| 3-4 | MCPTT Floor Control Server  ←  DUT1 | Floor Grant message | A Floor Grant message is sent from the MCPTT Floor Control Server to DUT1 to notify that the floor request has been granted.  The user of DUT1 is informed by a Permission Initiation tone on their device.  ● Floor Control Server state change [G: Floor Idle] à [G: Floor Taken]  ● DUT1 State Change: [U: Pending Request] à [U: Has Permission] |  |
|  |
| 5 | MCPTT Floor Control Server  →  DUT2 | Floor Taken message | For all the devices associated with the MCPTT Group (DUT2 & DUT3) are sent a Floor Taken message.  ● The state of DUT2 & DUT3 remains unchanged as [U: Has No Permission] |  |
| 6 | MCPTT Floor Control Server  →  DUT2 |  |
| 7 | DUT1  →  Controlling MCPTT Server | RTP (Voice) Media | Upon successful receipt of the Floor Grant message, DUT1 will start to forward RTP (voice) media packets toward the Controlling MCPTT Server. |  |
| 8 | Controlling MCPTT Server  ←  DUT2 | RTP (Voice) Media | The Controlling MCPTT Server distributes the RTP (voice) media to all the other MCPTT DUT in the MCPTT group call. |  |
| 9 | Controlling MCPTT Server  ←  DUT3 |  |
| 10- 11 | DUT1  →  MCPTT Floor Control Server | Floor Release Message | When DUT1 has completed their communication, they will release the PTT Button - this action will send a Floor Release message from the DUT1 towards teh MCPTT Floor Control Server.  This action will also result in the termination of the RTP (voice) Media at the same time.  ● DUT1 State Change: [U: Has Permission] à [U: Pending Release] |  |
| 12 | MCPTT Floor Control Server  ←  DUT1 | Floor Idle message | Upon receiving the Floor Release message from DUT1, the MCPTT Floor Control Server will send a Floor Idle message to all the DUTs in the MCPTT group call.  With the release of the RTP Media by DUT1, this will also result in the RTP (voice) media session to be terminated for all DUTs in the MCPTT Group call.  ● Floor Control Server state change: [G: Floor Taken] à [G: Floor Idle]  ● The state of DUT2 & DUT3 remains unchanged as [U: Has No Permission] |  |
| 13 | MCPTT Floor Control Server  ←  DUT3 |  |
| 14 | MCPTT Floor Control Server  ←  DUT3 |  |

**Example message flow:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **Direction DUT - NW** | **Message** | **Comments** |
| Emergency Group Call with Idle floor | | | |
| 1 | -- > | DUT-1 initiates a Floor Request |  |
| 2 | <-- | MCPTT Floor Control Server responds with Floor Granted |  |
| 3 | <-- | MCPTT Floor Control Server notifies to DUT-2 that Floor is Taken |  |
| 4 | <-- | MCPTT Floor Control Server notifies to DUT-3 that Floor is Taken |  |
| 5 | --> | DUT-1 transmits RTP Voice Media |  |
| 6 | <-- | MCPTT Server sends audio to DUT-2 & DUT-3 |  |
| 7 | --> | DUT-1 releases Floor and Voice Media |  |
| 8 | <-- | Floor & Voice Media is released towards DUT-2 & DUT-3 |  |
| 9 | <-- | Floor Idle notification sent to DUT-1, DUT-2 & DUT-3. |  |

**Details flow sequence diagram:**



#### 110.2.6.2 On-Network Floor Control requested whilst floor is taken, and Queuing is not applied

**Description**

On-Network, Pre-arranged group establishment for an on-demand Group Call for basic Talk/Media Burst, where the Floor Control Server does not offer Floor Queuing and a Floor Request is initiated whilst an ongoing Media Bust is in progress.

In this test case we have 3 MCX DUTs, of which one is the Initiating DUT that will initiate a floor control request and we will have two Participating DUTs. All three DUTs are active and in the same MCS Group (MCS). The initiating DUT (MCPTT Client A) will initiate a Talk Burst/Media Burst Group call and the Participating DUTs will be notified of the Floor Control progress and session as the group call is set up.

**Applicability**

3GPP MCS Rel.15 or later

**Related core specifications / References**

The following references were used in the development of this test case:

3GPP TS 24.379

3GPP TS 24.380

3GPP TS 24.483

3GPP TS 24.484

**Reason for test**

Verify the MCPTT service is able to establish a successful Floor Control session between multiple participating DUTs in the same Group Call

To verify that a MCPTT Emergency Group Call can be established and provide priority access to the requesting Entity.

**Initial configuration**

Same as in Test Case 110.2.6.1

Note: for this test scenario all DUTs have equal Floor Priority of 10.

**Test procedure**

**Scenario B: Floor Request Initiated whilst a Floor Grant is in progress where DUT have same Floor Priority**

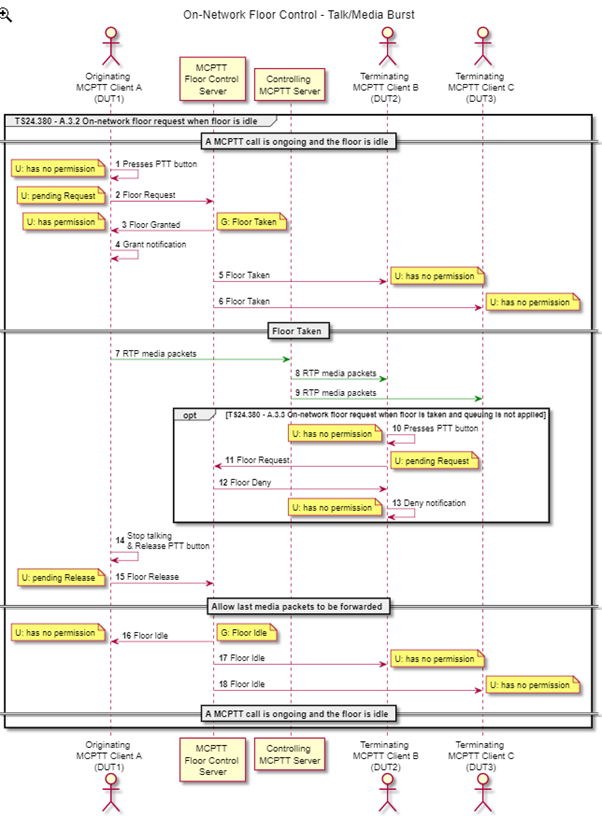
| **Step** | **Direction** | **Message** | **Comments** |  |
| --- | --- | --- | --- | --- |
| 1-2 | DUT1  →  MCPTT Floor Control Server | Floor Request message | DUT1 initiates a MC PTT floor request session by pressing the PTT Button on their device (and keeping it pressed for the duration of the communication needed).  The MCPTT Floor Control Server identifies that the floor is idle (no ongoing sessions are in progress) & verifies that DUT1 is authorised and permits the request.  The following State Changes are applied:  ● DUT1 State Change: [U: Has No Permission] → [U: Pending Request] |  |
| 3-4 | MCPTT Floor Control Server  ←  DUT1 | Floor Grant message | A Floor Grant message is sent from the MCPTT Floor Control Server to DUT1 to notify that the floor request has been granted.  The user of DUT1 is informed by a Permission Initiation tone on their device.  The following State Changes are applied:  ● Floor Control Server state change [G: Floor Idle] à [G: Floor Taken]  ● DUT1 State Change: [U: Pending Request] à [U: Has Permission] |  |
|  |
| 5 | MCPTT Floor Control Server  →  DUT2 | Floor Taken message | For all the devices associated with the MCPTT Group (DUT2 & DUT3) are sent a Floor Taken message.  The following State Changes are applied:  ● The state of DUT2 & DUT3 remains unchanged as [U: Has No Permission] |  |
| 6 | MCPTT Floor Control Server  →  DUT2 |  |
| 7 | DUT1  →  Controlling MCPTT Server | RTP (Voice) Media | Upon successful receipt of the Floor Grant message, DUT1 will start to forward RTP (voice) media packets toward the Controlling MCPTT Server. |  |
| 8 | Controlling MCPTT Server  ←  DUT2 | RTP (Voice) Media | The Controlling MCPTT Server distributes the RTP (voice) media to all the other MCPTT DUT in the MCPTT group call. |  |
| 9 | Controlling MCPTT Server  ←  DUT3 |  |
| 10- 11 | DUT2  →  MCPTT Floor Control Server | Floor Request message | DUT2 initiates a MC PTT floor request session by pressing the PTT Button on their device (and keeping it pressed for the duration of the communication needed).  The MCPTT Floor Control Server identifies that the floor is idle (no ongoing sessions are in progress) & verifies that DUT1 is authorised and permits the request.  The following State Changes are applied:  ● DUT2 State Change: [U: Has No Permission] → [U: Pending Request] |  |
| 12- 13 | MCPTT Floor Control Server  →  DUT2 | Floor Deny message | As no Floor Queuing is supported, the MCPTT Floor Control Server will respond to DUT3 with a Floor Deny message.  The user of DUT is notified with a Deny notification (e.g.tone).  The following State Changes are applied:  ● DUT2 State Change: [U: Pending Request] → [U: Has No Permission] |  |
| 14- 15 | DUT1  →  MCPTT Floor Control Server | Floor Release Message | When DUT1 has completed their communication, they will release the PTT Button - this action will send a Floor Release message from the DUT1 towards teh MCPTT Floor Control Server.  This action will also result in the termination of the RTP (voice) Media at the same time.  The following State Changes are applied:  ● DUT1 State Change: [U: Has Permission] → [U: Pending Release] |  |
| 16 | MCPTT Floor Control Server  ←  DUT1 | Floor Idle message | Upon receiving the Floor Release message from DUT1, the MCPTT Floor Control Server will send a Floor Idle message to all the DUTs in the MCPTT group call.  With the release of the RTP Media by DUT1, this will also result in the RTP (voice) media session to be terminated for all DUTs in the MCPTT Group call.  The following State Changes are applied:  ● Floor Control Server state change: [G: Floor Taken] → [G: Floor Idle]  ● The state of DUT2 & DUT3 remains unchanged as [U: Has No Permission] |  |
| 17 | MCPTT Floor Control Server  ←  DUT3 |  |
| 18 | MCPTT Floor Control Server  ←  DUT3 |  |

**Example message flow:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **Direction DUT - NW** | **Message** | **Comments** |
| Emergency Group Call with Idle floor | | | |
| 1 | -- > | DUT-1 initiates a Floor Request |  |
| 2 | <-- | MCPTT Floor Control Server responds with Floor Granted |  |
| 3 | <-- | MCPTT Floor Control Server notifies to DUT-2 that Floor is Taken |  |
| 4 | <-- | MCPTT Floor Control Server notifies to DUT-3 that Floor is Taken |  |
| 5 | --> | DUT-1 transmits RTP Voice Media |  |
| 6 | <-- | MCPTT Server sends audio to DUT-2 & DUT-3 |  |
| 7 | --> | DUT-2 initiates a Floor Request |  |
| 8 | <-- | MCPTT Server sends Deny Floor notification to DUT-2 |  |

**Details flow sequence diagram:**

The following shows the sequence flow for this test case.

****

# 111 Mission Critical Data (MCData)

*Editor’s note: not available yet*

# 112 Mission Critical Video (MCVideo)

*Editor’s note: not available yet*

Document Management

Document History

| Version | Date | Brief Description of Change | Approval Authority | Editor / Company |
| --- | --- | --- | --- | --- |
| 36 | 20/09/2021 | Rev. of this PRD as described in Annex J, approved at TSG FT#75 | TSG#45 | Momar Goumballe / Orange |
| 37 | 03/01/2022 | Rev. of this PRD as described in Annex J, approved at TSG FT#76 | TSG#46 | Momar Goumballe / Orange |
| 38 | 08/03/2022 | Rev. of this PRD as described in Annex J, approved at TSG FT#77 | TSG#47 | Momar Goumballe / Orange |
| 39 | 18/07/2022 | Rev. of this PRD as described in Annex J, approved at TSG FT#78 | TSG#48 | Momar Goumballe / Orange |
| 40 | 18/10/2022 | Rev. of this PRD as described in Annex J, approved at TSG FT#79 | TSG#49 | Momar Goumballe / Orange |
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Other Information

|  |  |
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