**3GPP TSG- Meeting # *xyz***

**, , 12th – 20th May 2022 (was C1-223511)**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** | **0813** | **rev** | **1** | **Current version:** | **0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network | **x** |

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| ***Title:*** | Corrections for call transfer | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | e | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | |  |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The current specification the user experience for MCPTT private call announced transfer is not good, as it is build based on two independent calls. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The changes tie the two calls together to avoid the interrupt that currently occurs.   * Add handling of <transfer-announced-ind> and <replaces-header-value> to 6.2.3.1.1 * Add SIP Replaces header to 11.1.1.2.1.1 * Add SIP Replaces header to 11.1.1.2.2.1 * Add SIP Call-ID Header handling to 11.1.8.2.1 * Add SIP Call-ID Header handling to 11.1.8.2.2 * Adding <replaces-header-value> and <transfer-announced-ind> elements to XML schema * Adding <replaces-header-value> and <transfer-announced-ind> elements to Semantics | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | User experience of announced call transfer will remain not good | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.2.3.1.1, 11.1.1.2.1.1, 11.1.1.2.2.1, 11.1.8.2.1, 11.1.8.2.2, 11.1.8.2.3 F.1.2, F.1.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* First Change \* \* \* \*

##### 6.2.3.1.1 Automatic commencement mode for private calls

When performing the automatic commencement mode procedures, the MCPTT client:

1) shall accept the SIP INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [4];

2) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;

3) shall include the g.3gpp.mcptt media feature tag in the Contact header field of the SIP 200 (OK) response;

4) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcptt" in the Contact header field of the SIP 200 (OK) response;

5) shall include the Session-Expires header field in the SIP 200 (OK) response and start the SIP session timer according to IETF RFC 4028 [7]. The "refresher" parameter in the Session-Expires header field shall be set to "uas";

6) shall, if the incoming SIP INVITE request contains a Replaces header field, include in the SDP answer in the SIP 200 (OK) response to the SDP offer the parameters used for the pre-established session identified by the contents of the Replaces header field;

7) shall, if the incoming SIP INVITE request does not contain a Replaces header field, include an SDP answer in the SIP 200 (OK) response to the SDP offer in the incoming SIP INVITE request according to 3GPP TS 24.229 [4] with the clarifications given in clause 6.2.2;

NOTE: In the case of a new emergency call where the terminating client is using a pre-established session, the SIP INVITE request containing a Replaces header is used to replace the pre-established session.

7a) shall, if the incoming SIP INVITE request contains a <transfer-announced-ind> element in the <anyExt> element of the <mcptt-Params> element of the <mcpttinfo> element contained in the application/vnd.3gpp.mcptt-info+xml MIME body, set the value of the <replaces-header-value> element contained in the <anyExt> element of the <mcptt-Params> element of the <mcpttinfo> element of the application/vnd.3gpp.mcptt-info+xml MIME body to the following value: The Call-ID header field, and the value of the from-tag header field parameter set to the value contained in the incoming SIP INVITE request. The value of the to-tag is the one set by the MCPTT client in the 200 (OK) response. Together they represent a dialog identifier;

8) shall send the SIP 200 (OK) response towards the MCPTT server according to rules and procedures of 3GPP TS 24.229 [4];

9) shall, if the incoming SIP INVITE request contains a Replaces header field, release the pre-established session identified by the contents of the Replaces header field; and

10) shall interact with the media plane as specified in 3GPP TS 24.380 [5] clause 6.2.

When NAT traversal is supported by the MCPTT client and when the MCPTT client is behind a NAT, generation of SIP responses is done as specified in this clause and as specified in IETF RFC 5626 [15].

\* \* \* Next Change \* \* \* \*

###### 11.1.1.2.1.1 Client originating procedures

Upon receiving a request from an MCPTT user to establish an MCPTT private call, or upon accepting a request to perform a private call transfer or a private call forwarding, the MCPTT client shall generate an initial SIP INVITE request by following the UE originating session procedures specified in 3GPP TS 24.229 [4], with the clarifications given below.

The MCPTT client:

1) shall set the Request-URI of the SIP INVITE request to a public service identity of the participating MCPTT function serving the MCPTT user;

2) if the MCPTT user has requested the origination of a first-to-answer call, if the <allow-request-first-to-answer-call> element of the <ruleset> element is not present in the MCPTT user profile document (see the MCPTT user profile document in 3GPP TS 24.484 [50]) or is set to a value of "false", the MCPTT client shall inform the MCPTT user and shall exit this procedure;

3) if the MCPTT user has requested the origination of an MCPTT emergency private call or is originating an MCPTT private call and the MCPTT emergency state is already set, the MCPTT client:

a) shall, if this is an authorised request for an MCPTT emergency private call as determined by the procedures of clause 6.2.8.3.1.1, comply with the procedures in clause 6.2.8.3.2; and

b) should, if this is an unauthorised request for an MCPTT emergency private call as determined in step a) above, indicate to the MCPTT user that they are not authorised to initiate an MCPTT emergency private call;

4) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [4];

5) shall include the g.3gpp.mcptt media feature tag and the g.3gpp.icsi-ref media feature tag with the value of "urn:urn-7:3gpp-service.ims.icsi.mcptt" in the Contact header field of the SIP INVITE request according to IETF RFC 3840 [16];

6) shall include an Accept-Contact header field containing the g.3gpp.mcptt media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [6];

7) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcptt" (coded as specified in 3GPP TS 24.229 [4]), in a P-Preferred-Service header field according to IETF RFC 6050 [9] in the SIP INVITE request;

8) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref contain with the value of "urn:urn-7:3gpp-service.ims.icsi.mcptt" along with parameters "require" and "explicit" according to IETF RFC 3841 [6];

9) for the establishment of a private call shall insert in the SIP INVITE request a MIME resource-lists body with the MCPTT ID of the invited MCPTT user or the URI of the functional alias to be called, according to rules and procedures of IETF RFC 5366 [20];

NOTE 1: The MCPTT client indicates whether an MCPTT ID or a functional alias is to be called as specified in step 14) c) ii).

10) for the establishment of a first-to-answer call shall insert in the SIP INVITE request according to rules and procedures of IETF RFC 5366 [20] a MIME resource-lists body with:

a) the MCPTT IDs of the potential target MCPTT users; or

b) the URI of the functional alias to be called;

NOTE 2: The MCPTT client indicates whether a list of MCPTT IDs or a functional alias is to be called as specified in step 15) b).

11) if an end-to-end security context needs to be established and if the MCPTT user is initiating a private call then:

a) if necessary, shall instruct the key management client to request keying material from the key management server as described in 3GPP TS 33.180 [78];

b) shall use the keying material to generate a PCK as described in 3GPP TS 33.180 [78];

c) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0001" to indicate that the purpose of the PCK is to protect private call communications and with the remaining twenty eight bits being randomly generated as described in 3GPP TS 33.180 [78];

d) shall encrypt the PCK to a UID associated to the MCPTT client using the MCPTT ID and KMS URI of the invited user as determined by the procedures of clause 6.2.8.3.9 and a time related parameter as described in 3GPP TS 33.180 [78];

e) shall generate a MIKEY-SAKKE I\_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [78]; and

g) shall add the MCPTT ID of the originating MCPTT user to the initiator field (IDRi) of the I\_MESSAGE as described in 3GPP TS 33.180 [78]; and

f) shall sign the MIKEY-SAKKE I\_MESSAGE using the originating MCPTT user's signing key provided in the keying material together with a time related parameter, and add this to the MIKEY-SAKKE payload, as described in 3GPP TS 33.180 [78];

12) shall include an SDP offer according to 3GPP TS 24.229 [4] with the clarification given in clause 6.2.1 and with a media stream of the offered media-floor control entity;

13) if implicit floor control is required, shall comply with the conditions specified in clause 6.4 and:

a) if the <allow-location-info-when-talking> element of the <ruleset> element of the MCPTT user profile document identified by the MCPTT ID of the calling MCPTT user (see the MCPTT user profile document in 3GPP TS 24.484 [50]) is set to a value of "true"; and

b) if location information has not yet been included in the SIP re-INVITE request;

then shall include an application/vnd.3gpp.mcptt-location-info+xml MIME body with a <Report> element included in the <location-info> root element;

14) if the MCPTT user is initiating a private call then:

a) if force of automatic commencement mode at the invited MCPTT client is requested by the MCPTT user, shall include in the SIP INVITE request a Priv-Answer-Mode header field with the value "Auto" according to the rules and procedures of IETF RFC 5373 [18];

b) if force of automatic commencement mode at the invited MCPTT client is not requested by the MCPTT user and:

i) if automatic commencement mode at the invited MCPTT client is requested by the MCPTT user, shall include in the SIP INVITE request an Answer-Mode header field with the value "Auto" according to the rules and procedures of IETF RFC 5373 [18]; and

ii) if manual commencement mode at the invited MCPTT client is requested by the MCPTT user, shall include in the SIP INVITE request an Answer-Mode header field with the value "Manual" according to the rules and procedures of IETF RFC 5373 [18]; and

b1) if the MCPTT client initiates the private call upon accepting a request to perform a private call transfer, and the received SIP MESSAGE request contains a <replaces-header-value> element in the <anyExt> element of the <mcptt-Params> element of the <mcpttinfo> element contained in the application/vnd.3gpp.mcptt-info+xml MIME body then

i) shall include a SIP Replaces header field with the header field value set to the value in the <replaces-header-value> element of the incoming SIP MESSAGE request; and

c) shall contain an application/vnd.3gpp.mcptt-info+xml MIME body with the <mcpttinfo> element containing the <mcptt-Params> element:

i) with the <session-type> element set to a value of "private";

ii) with the <call-to-functional-alias-ind> set to "true" if the MCPTT client is aware of active functional aliases and an active functional alias is to be called or "false" otherwise; and

iii) if the MCPTT client needs to include an active functional alias in the initial SIP INVITE request, with the <functional-alias-URI> set to the URI of the used functional alias;

NOTE 3: The MCPTT client learns the functional aliases that are activated for an MCPTT ID from procedures specified in clause 9A.2.1.3.

14A) if the MCPTT client initiates the private call upon accepting a request to perform a private call transfer then:

a) shall include in the SIP INVITE request a Priv-Answer-Mode header field with the same value as in the MCPTT call to be transferred according to the rules and procedures of IETF RFC 5373 [18]; and

b) shall contain an application/vnd.3gpp.mcptt-info+xml MIME body with the <mcpttinfo> element containing the <mcptt-Params> element:

i) with the <session-type> element set to a value of "private";

ii) if the MCPTT client needs to include an active functional alias in the initial SIP INVITE request, with the <functional-alias-URI> set to the URI of the used functional alias; and

iii) with the <call-transfer-ind> element set to "true";

14B) if the MCPTT client initiates the private call upon accepting a request to perform a private call forwarding then:

a) shall include in the SIP INVITE request a Priv-Answer-Mode header field with the same value as in the MCPTT call to be forwarded according to the rules and procedures of IETF RFC 5373 [18];

b) if the "SIP MESSAGE request for forwarding private call request for terminating client" contained a <forwarding-reason> with a value of "immediate", shall append an entry containing the MCPTT ID of the forwarded MCPTT user to the <forwarding-immediate-list>;

c) if the "SIP MESSAGE request for forwarding private call request for terminating client" contained a <forwarding-reason> with a value of "no-answer", or "manual-input", append an entry containing the MCPTT ID of the forwarded MCPTT user to the <forwarding-other-list>;

d) shall cache both the <forwarding-immediate-list> and the <forwarding-other-list> until a final response for the SIP INVITE is received; and

e) shall include an application/vnd.3gpp.mcptt-info+xml MIME body with the <mcpttinfo> element containing the <mcptt-Params> element with:

i) the <session-type> element set to a value of "private";

ii) if the MCPTT client needs to include an active functional alias in the initial SIP INVITE request, the <functional-alias-URI> set to the URI of the used functional alias;

iii) the <call-forwarding-ind> element set to "true";

iv) the <forwarding-immediate-list> element; and

v) the <forwarding-other-list> element.

15) if the MCPTT user is initiating a first-to-answer call shall contain an application/vnd.3gpp.mcptt-info+xml MIME body with the <mcpttinfo> element containing the <mcptt-Params> element;

a) with the <session-type> element set to a value of "first-to-answer";

b) with the <call-to-functional-alias-ind> set to "true" if the MCPTT client is aware of active functional aliases and an active functional alias is to be called or "false" otherwise; and

c) if the MCPTT client needs to include an active functional alias in the initial SIP INVITE request, with the <functional-alias-URI> set to the URI of the used functional alias;

NOTE 4: The MCPTT client learns the functional aliases that are activated for an MCPTT ID from procedures specified in clause 9A.2.1.3.

16) if the MCPTT emergency private call state is set to either "MEPC 2: emergency-pc-requested" or "MEPC 3: emergency-pc-granted" or the MCPTT emergency private priority state for this private call is set to "MEPP 2: in-progress", the MCPTT client shall comply with the procedures in clause 6.2.8.3.3; and

17) shall send SIP INVITE request towards the MCPTT server according to 3GPP TS 24.229 [4].

Upon receiving a SIP 183(Session Progress) response to the SIP INVITE request the MCPTT client:

1) may indicate the progress of the session establishment to the inviting MCPTT user.

Upon receiving a SIP 200 (OK) response to the SIP INVITE request the MCPTT client:

1) shall interact with the media plane as specified in 3GPP TS 24.380 [5];

2) if the sent SIP INVITE request was for the origination of a first-to-answer call and the SDP answer contained in the received SIP 200 (OK) response contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I\_MESSAGE:

a) shall extract the MCPTT ID of the sender of the SIP 200 (OK) response from the initiator field (IDRi) of the I\_MESSAGE as described in 3GPP TS 33.180 [78];

b) shall convert the MCPTT ID to a UID as described in 3GPP TS 33.180 [78];

c) shall use the UID to validate the signature of the MIKEY-SAKKE I\_MESSAGE as described in 3GPP TS 33.180 [78];

d) if authentication verification of the MIKEY-SAKKE I\_MESSAGE fails:

i) if the sent SIP INVITE request was a request for an MCPTT emergency private call and if the MCPTT emergency private call state is set to "MEPC 2: emergency-pc-requested, the MCPTT client:

A) shall set the MCPTT emergency private call state to "MEPC 1: emergency-pc-capable";

B) if the MCPTT emergency private priority state of the private call is "MEPP 3: confirm-pending" shall set the MCPTT emergency private priority state of the private call to "MEPP 1: no-emergency"; and

C) if the sent SIP request for an MCPTT emergency private call contained an application/vnd.3gpp.mcptt-info+xml MIME body with an <alert-ind> element set to a value of "true", shall set the MCPTT private emergency alert state to "MPEA 1: no-alert". and

ii) shall release the session as specified in the procedures of clause 11.1.3.1.1.1 with the following clarifications:

A) shall include in the SIP BYE request an application/vnd.3gpp.mcptt-info+xml MIME body containing a <release-reason> element set to a value of "authentication of the MIKEY-SAKE I\_MESSAGE failed"; and

B) shall skip the remaining steps in the present clause; and

e) if the signature of the MIKEY-SAKKE I\_MESSAGE was successfully validated:

i) shall extract and decrypt the encapsulated PCK using the originating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [78]; and

ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [46];

NOTE 5: With the PCK successfully shared between the originating MCPTT client and the terminating MCPTT client, both clients are able to use SRTP/SRTCP to create an end-to-end secure session.

3) if the MCPTT emergency private call state is set to "MEPC 2: emergency-pc-requested" or "MEPC 3: emergency-pc-granted", shall perform the actions specified in clause 6.2.8.3.4; and

3A) may notify the answer state to the user (i.e. "Unconfirmed" or "Confirmed") if received in the P-Answer-State header field; and

4) shall notify the user that the call has been successfully established.

Upon receiving a SIP 300 (Multiple Choices) response to the SIP INVITE request the MCPTT client shall use the MCPTT ID of MCPTT user contained in the <mcptt-request-uri> element of an application/vnd.3gpp.mcptt-info MIME body as the MCPTT ID of the invited MCPTT user and shall generate an initial SIP INVITE request by following the UE originating session procedures specified in 3GPP TS 24.229 [4], with the clarifications given in this clause and with the following additional clarifications:

1) shall insert in the SIP INVITE request a MIME resource-lists body with the MCPTT ID of the invited MCPTT user returned in the SIP 300 (Multiple Choices) response to the initial SIP INVITE request for establishing a private call, according to rules and procedures of IETF RFC 5366 [20];

2) shall not include a <call-to-functional-alias-ind> element into the <mcptt-Params> element of the <mcpttinfo> element of an application/vnd.3gpp.mcptt-info+xml MIME body; and

3) shall include a <called-functional-alias-URI> element into the <mcptt-Params> element of the <mcpttinfo> element of an application/vnd.3gpp.mcptt-info+xml MIME body with the target functional alias URI used in the initial SIP INVITE request for establishing a private call.

On receiving a SIP 4xx response, a SIP 5xx response or a SIP 6xx response to the SIP INVITE request:

1) if the MCPTT emergency private call state is set to "MEPC 2: emergency-pc-requested"; or

2) if the MCPTT emergency private call state is set to "MEPC 3: emergency-pc-granted";

the MCPTT client shall perform the actions specified in clause 6.2.8.3.5.

On receiving a SIP INFO request where the Request-URI contains an MCPTT session ID identifying an ongoing session, the MCPTT client shall follow the actions specified in clause 6.2.8.3.7.

\* \* \* Next Change \* \* \* \*

###### 11.1.1.2.2.1 Client originating procedures

Upon receiving a request from an MCPTT user to establish an MCPTT private call within a pre-established session, or upon accepting a request to complete a private call transfer or a private call forwarding within a pre-established session, the MCPTT client shall generate a SIP REFER request outside a dialog in accordance with the procedures specified in 3GPP TS 24.229 [4], IETF RFC 4488 [22] and IETF RFC 3515 [25] as updated by IETF RFC 6665 [26] and IETF RFC 7647 [27], with the clarifications given below.

If the user requested the private call to be a first-to-answer call and if the <allow-request-first-to-answer-call> element of the <ruleset> element is not present in the MCPTT user profile document (see the MCPTT user profile document in 3GPP TS 24.484 [50]) or is set to a value of "false", the MCPTT client shall inform the MCPTT user and shall exit this procedure.

If the MCPTT user is initiating a private call and an end-to-end security context needs to be established the MCPTT client:

1) if necessary, shall instruct the key management client to request keying material from the key management server as described in 3GPP TS 33.180 [78];

2) shall use the keying material to generate a PCK as described in 3GPP TS 33.180 [78];

3) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0001" to indicate that the purpose of the PCK is to protect private call communications and with the remaining twenty eight bits being randomly generated as described in 3GPP TS 33.180 [78];

4) shall encrypt the PCK to a UID associated to the MCPTT client using the MCPTT ID and KMS URI of the invited user as determined by the procedures of clause 6.2.8.3.9 and a time related parameter as described in 3GPP TS 33.180 [78];

5) shall generate a MIKEY-SAKKE I\_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [78];

6) shall add the MCPTT ID of the originating MCPTT user to the initiator field (IDRi) of the I\_MESSAGE as described in 3GPP TS 33.180 [78]; and

7) shall sign the MIKEY-SAKKE I\_MESSAGE using the originating MCPTT user's signing key provided in the keying material together with a time related parameter, and add this to the MIKEY-SAKKE payload, as described in 3GPP TS 33.180 [78].

The MCPTT client populates the SIP REFER request as follows:

1) shall include the Request-URI set to the public service identity identifying the pre-established session on the MCPTT server serving the MCPTT user;

2) shall include the Refer-Sub header field with value "false" according to rules and procedures of IETF RFC 4488 [22];

3) shall include the Supported header field with value "norefersub" according to rules and procedures of IETF RFC 4488 [22];

4) shall include the option tag "multiple-refer" in the Require header field;

5) may include a P-Preferred-Identity header field in the SIP REFER request containing a public user identity as specified in 3GPP TS 24.229 [4];

6) shall include a P-Preferred-Service header field set to the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcptt" (coded as specified in 3GPP TS 24.229 [4]), according to IETF RFC 6050 [9];

7) shall set the Refer-To header field of the SIP REFER request as specified in IETF RFC 3515 [25] with a Content-ID ("cid") Uniform Resource Locator (URL) as specified in IETF RFC 2392 [62] that points to an application/resource-lists MIME body as specified in IETF RFC 5366 [20], and with the Content-ID header field set to this "cid" URL;

8) for the initiation of a private call, shall include in the application/resource-lists MIME body a single <entry> element containing a "uri" attribute set to the MCPTT ID of the called user or the URI of the functional alias to be called, extended with the following URI header fields:

NOTE 1: Characters that are not formatted as ASCII characters are escaped in the following parameters in the headers portion of the SIP URI.

NOTE 1A: The MCPTT client indicates whether an MCPTT ID or a functional alias is to be called as specified in step 8) c) ii) C).

a) if force of automatic commencement mode at the invited MCPTT client is requested by the MCPTT user, shall include a Priv-Answer-Mode header field with the value "Auto" according to the rules and procedures of IETF RFC 5373 [18];

b) if force of automatic commencement mode at the invited MCPTT client is not requested by the MCPTT user and:

i) if automatic commencement mode at the invited MCPTT client is requested by the MCPTT user, shall include an Answer-Mode header field with the value "Automatic" according to rules and procedures of IETF RFC 5373 [18]; and

ii) if manual commencement mode at the invited MCPTT client is requested by the MCPTT user, shall include an Answer-Mode header field with the value "Manual" according to rules and procedures of IETF RFC 5373 [18];

b1) if the MCPTT client initiates the private call upon accepting a request to perform a private call transfer, and the received SIP MESSAGE request contains a <replaces-header-value> element in the <anyExt> element of the <mcptt-Params> element of the <mcpttinfo> element contained in the application/vnd.3gpp.mcptt-info+xml MIME body then

i) shall include a SIP Replaces header field with the header field value set to the value in the <replaces-header-value> element of the incoming SIP MESSAGE request; and

c) shall include in an hname "body" parameter:

i) if the SDP parameters of the pre-established session do not contain a media-level section of a media-floor control entity or if end-to-end security is required for the private call, an application/sdp MIME body containing the SDP parameters of the pre-established session according to 3GPP TS 24.229 [4] with the clarifications given in clause 6.2.1. If implicit floor control is required and the pre-established session was not established with an implicit floor request, then the application/sdp MIME body shall contain an implicit floor request as specified in clause 6.4; and

ii) an application/vnd.3gpp.mcptt-info MIME body:

A) with the <session-type> element set to "private";

B) if the MCPTT client needs to include an active functional alias in the SIP REFER request, with the <functional-alias-URI> set to the URI of the used functional alias;

NOTE 2: The MCPTT client learns the functional aliases that are activated for an MCPTT ID from procedures specified in clause 9A.2.1.3.

C) with the <call-to-functional-alias-ind> set to "true" if the MCPTT client is aware of active functional aliases and an active functional alias is to be called or "false" otherwise;

D) if the MCPTT client initiates the private call upon accepting a request to perform a private call transfer then shall include the <call-transfer-ind> set to "true"; and

E) if the MCPTT client initiates the private call upon accepting a request to perform a private call forwarding then:

x1) if the "SIP MESSAGE request for forwarding private call request for terminating client" contained a <forwarding.reason> with a value of "immediate", shall append an entry containing the MCPTT ID of the forwarded MCPTT user to the <forwarding-immediate-list>;

x2) if the "SIP MESSAGE request for forwarding private call request for terminating client" contained a <forwarding.reason> with a value of "no-answer", or "manual-input", shall append an entry containing the MCPTT ID of the forwarded MCPTT user to the <forwarding-other-list>;

x3) shall cache both the <forwarding-immediate-list> and the <forwarding-other-list> until a final response for the SIP REFER is received;

x4) shall include the <call-forwarding-ind> set to "true";

x5) shall include the <forwarding-immediate-list> element; and

x6) shall include the <forwarding-other-list> element;

9) for an initiation of a first-to-answer call, shall include in the application/resource-lists MIME body an <entry> element for each of the targeted MCPTT users, with each <entry> element containing a "uri" attribute set to the MCPTT ID of the targeted user, extended with hname "body" parameter in the headers portion of the SIP URI or a single <entry> element containing a "uri" attribute set to the URI of the functional alias is to be called, extended with hname "body" parameter in the headers portion of the SIP URI containing:

NOTE 3: Characters that are not formatted as ASCII characters are escaped in the following parameters in the headers portion of the SIP URI.

NOTE 3A: The MCPTT client indicates whether a list of MCPTT IDs or a functional alias is to be called as specified in step 9) b) ii).

a) if the SDP parameters of the pre-established session do not contain a media-level section of a media-floor control entity, an application/sdp MIME body containing the SDP parameters of the pre-established session according to 3GPP TS 24.229 [4] with the clarification given in clause 6.2.1. If implicit floor control is required and the pre-established session was not established with an implicit floor request, then the application/sdp MIME body shall contain an implicit floor request as specified in clause 6.4; and

b) an application/vnd.3gpp.mcptt-info MIME body:

i) with the <session-type> element set to "first-to-answer";

ii) with the <call-to-functional-alias-ind> set to "true" if the MCPTT client is aware of active functional aliases and an active functional alias is to be called or "false" otherwise; and

iii) if the MCPTT client needs to include an active functional alias in the SIP REFER request, with the <functional-alias-URI> set to the URI of the used functional alias;

10) if the MCPTT user has requested the origination of an MCPTT emergency private call or is originating an MCPTT private call and the MCPTT emergency state is already set, the MCPTT client:

a) if this is an authorised request for an MCPTT emergency private call as determined by the procedures of clause 6.2.8.3.1.1, shall comply with the procedures in clause 6.2.8.3.2; and

b) if this is an unauthorised request for an MCPTT emergency private call as determined in step a) above, should indicate to the MCPTT user that they are not authorised to initiate an MCPTT emergency private call;

11) if the MCPTT emergency private priority state for this call is set to "MEPP 2: in-progress", the MCPTT client shall comply with the procedures in clause 6.2.8.3.3;

12) shall include a Target-Dialog header field as specified in IETF RFC 4538 [23] identifying the pre-established session; and

13) if:

a) implicit floor control is required;

b) the pre-established session was not established with an implicit floor request; and

c) location information has not yet been included in the SIP REFER request;

then shall include an application/vnd.3gpp.mcptt-location-info+xml MIME body with a <Report> element included in the <location-info> root element.

The MCPTT client shall send the SIP REFER request towards the MCPTT server according to 3GPP TS 24.229 [4].

Upon receiving a SIP 300 (Multiple Choices) response to the SIP REFER request the MCPTT client shall use the MCPTT ID of MCPTT user contained in the <mcptt-request-uri> element of an application/vnd.3gpp.mcptt-info MIME body as the MCPTT ID of the invited MCPTT user and shall generate a SIP REFER request outside a dialog in accordance with the procedures specified in 3GPP TS 24.229 [4], IETF RFC 4488 [22] and IETF RFC 3515 [25] as updated by IETF RFC 6665 [26] and IETF RFC 7647 [27], with the clarifications given below in this clause with following additional clarifications:

1) shall insert in the SIP REFER request a MIME resource-lists body with the MCPTT ID of the invited MCPTT user returned in the SIP 300 (Multiple Choices) response to the initial SIP REFER request for establishing a private call, according to rules and procedures of IETF RFC 5366 [20];

2) shall not include an <call-to-functional-alias-ind> element into <mcptt-Params> element of the <mcpttinfo> element of an application/vnd.3gpp.mcptt-info+xml MIME body; and

3) shall include a <called-functional-alias-URI> element into <mcptt-Params> element of the <mcpttinfo> element of an application/vnd.3gpp.mcptt-info+xml MIME body with the target functional alias URI used in the initial SIP REFER request for establishing a private call.

Upon receiving a final SIP 2xx response to the SIP REFER request the MCPTT client shall interact with media plane as specified in 3GPP TS 24.380 [5].

On receiving a SIP 4xx response, SIP 5xx response or a SIP 6xx response to the SIP REFER request for an MCPTT emergency private call:

1) if the MCPTT emergency private call state is set to "MEPC 2: emergency-pc-requested", the MCPTT client shall perform the actions specified in clause 6.2.8.3.5; and

2) shall skip the remaining steps.

Upon receipt of a SIP re-INVITE request within the pre-established session targeted by the sent SIP REFER request, the MCPTT client:

1) if the sent SIP REFER request was a request to originate a first-to-answer call:

a) if the received SIP re-INVITE request contains an SDP offer including an a=key-mgmt attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I\_MESSAGE:

i) shall extract the MCPTT ID of the sender of the SIP 200 (OK) response from the initiator field (IDRi) of the I\_MESSAGE as described in 3GPP TS 33.180 [78];

ii) shall convert the MCPTT ID to a UID as described in 3GPP TS 33.180 [78];

iii) shall use the UID to validate the signature of the MIKEY-SAKKE I\_MESSAGE as described in 3GPP TS 33.180 [78];

iv) if authentication verification of the MIKEY-SAKKE I\_MESSAGE fails:

A) shall set the MCPTT emergency private call state to "MEPC 1: emergency-pc-capable";

B) if the MCPTT emergency private priority state of the private call is "MEPP 3: confirm-pending" shall set the MCPTT emergency private priority state of the private call to "MEPP 1: no-emergency";

C) if the sent SIP request for an MCPTT emergency private call contained an application/vnd.3gpp.mcptt-info+xml MIME body with an <alert-ind> element set to a value of "true", shall set the MCPTT private emergency alert state to "MPEA 1: no-alert"; and

D) shall release the session as specified in the procedures of clause 11.1.3.1.2.1 with the following clarifications:

I) shall include in the SIP BYE request an application/vnd.3gpp.mcptt-info+xml MIME body containing a <release-reason> element set to a value of "authentication of the MIKEY-SAKE I\_MESSAGE failed"; and

II) shall skip the remaining steps in the present clause; and

v) if the signature of the MIKEY-SAKKE I\_MESSAGE was successfully validated:

A) shall extract and decrypt the encapsulated PCK using the originating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [78]; and

B) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [78];

NOTE 4: With the PCK successfully shared between the originating MCPTT client and the terminating MCPTT client, both clients are able to use SRTP/SRTCP to create an end-to-end secure session.

2) if the sent SIP REFER request was a request for an MCPTT emergency private call:

a) if the MCPTT emergency private call state is set to "MEPC 2: emergency-pc-requested" or "MEPC 3: emergency-pc-granted":

i) shall set the MCPTT emergency private priority state of the call to "MEPP 2: in-progress" if it was not already set;

ii) shall set the MCPTT emergency private call state to "MEPC 3: emergency-pc-granted"; and

iii) if the MCPTT private emergency alert state is set to "MPEA 2: emergency-alert-confirm-pending" and:

A) if the SIP re-INVITE request contains an <alert-ind> element set to a value of "true" or does not contain an <alert-ind> element, shall set the MCPTT private emergency alert state to " MPEA 3: emergency-alert-initiated "; or

B) if the SIP re-INVITE request contains an <alert-ind> element set to a value of "false", shall set the MCPTT private emergency alert state to "MPEA 1: no-alert ";

3) shall check if a Resource-Priority header field is included in the incoming SIP re-INVITE request and may perform further actions outside the scope of this specification to act upon an included Resource-Priority header field as specified in 3GPP TS 24.229 [4];

4) shall accept the SIP re-INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [4];

5) shall include an SDP answer in the SIP 200 (OK) response to the SDP offer in the incoming SIP re-INVITE request according to 3GPP TS 24.229 [4], based upon the parameters already negotiated for the pre-established session; and

6) shall send the SIP 200 (OK) response towards the participating MCPTT function according to rules and procedures of 3GPP TS 24.229 [4].

On call release by interaction with the media plane as specified in clause 9.2.2 of 3GPP TS 24.380 [5] if the sent SIP REFER request was a request for an MCPTT emergency private call, the MCPTT client shall perform the procedures specified in clause 6.2.8.1.18.

\* \* \* Next Change \* \* \* \*

##### 11.1.8.2.1 Private call transfer request procedures

Upon receiving a request from an MCPTT user to transfer an ongoing MCPTT private call to a target MCPTT user, the MCPTT client:

1) if:

a) the <allow-call-transfer> element of the <ruleset> element is not present in the requesting MCPTT user's MCPTT user profile document (see the MCPTT user profile document in 3GPP TS 24.484 [50]) or is set to a value of "false";

then:

a) should indicate to the requesting MCPTT user that the requesting MCPTT user is not authorised to initiate a private call transfer request; and

b) shall skip the rest of the steps of the present clause;

2) if the request from the MCPTT user is for an announced transfer of an ongoing MCPTT private call to a target MCPTT user, shall follow the procedure of clause 11.1.8.2.3;

3) shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [4] and IETF RFC 3428 [33] with the following clarifications:

a) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcptt" (coded as specified in 3GPP TS 24.229 [4]), in a P-Preferred-Service header field according to IETF RFC 6050 [9] in the SIP MESSAGE request;

b) shall include an Accept-Contact header field with the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcptt" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [6];

c) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [4];

d) shall include an application/vnd.3gpp.mcptt-info+xml MIME body as specified in clause F.1 with the <mcpttinfo> element containing the <mcptt-Params> element with the <anyExt> element containing:

i) the <request-type> element set to a value of "transfer-private-call-request";

ii) the <mcptt-called-party-id> element set to MCPTT ID of the transferred MCPTT user;

iii) if the call is requested to be transferred to a functional alias and the MCPTT client is aware of active functional aliases, then with the <call-to-functional-alias-ind> set to "true"; otherwise,with the <call-to-functional-alias-ind> set to "false"; and

iv) if the request from the MCPTT user is for an announced transfer, and the incoming SIP INVITE request contained a Supported header field containing an option tag "replaces", and, if present, the <replaces-header-value> element set to content copied from the call to the target MCPTT user provided in step 2;

NOTE: For a call transfer to a MCPTT ID the value is the MCPTT ID of the target user, while for call transfer to a functional alias the value is the functional alias of the target user.

e) shall insert in the SIP MESSAGE request a MIME resource-lists body with the MCPTT ID of the transferred MCPTT user, according to rules and procedures of IETF RFC 5366 [20]; and

f) shall set the Request-URI to the public service identity identifying the participating MCPTT function serving the MCPTT user; and

4) shall send the SIP MESSAGE request towards the MCPTT server according to rules and procedures of 3GPP TS 24.229 [4].

Upon receipt of a SIP 4xx, 5xx or 6xx response to the SIP MESSAGE request, should indicate to the requesting MCPTT user the failure of the sent private call transfer request and skip the rest of the steps.

Upon receiving a "SIP MESSAGE request for transfer private call response for terminating client", the MCPTT client:

1) shall determine the success or failure of the sent transfer private call request from the value of the <transfer-call-outcome> element contained in the <anyExt> element of the <mcptt-Params> element of the <mcpttinfo> element of the application/vnd.3gpp.mcptt-info+xml MIME body included in the received SIP MESSAGE request and generate and send a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [4];

2) if the outcome of the private call transfer is a success, the MCPTT client shall invoke the procedures of clause 11.1.3.1 to end the MCPTT private call with the transferred MCPTT user; and

3) should indicate to the requesting MCPTT user the success or failure of the sent private call transfer request.

\* \* \* Next Change \* \* \* \*

##### 11.1.8.2.2 Client procedures for handling incoming private call transfer request

Upon receiving a "SIP MESSAGE request for transfer private call request for terminating client", the MCPTT client:

1) should indicate to the transferred MCPTT user that a request to transfer the previously ongoing call to a new target MCPTT user has been received;

2) shall extract the MCPTT ID of the target MCPTT user from the <mcptt-called-party-id> element contained in the <anyExt> element of the <mcptt-Params> element of the <mcpttinfo> element contained in the application/vnd.3gpp.mcptt-info+xml MIME body contained in the received SIP MESSAGE request;

3) if present in the received SIP MESSAGE request, shall extract the content of the <replaces-header-value> element contained in the <anyExt> element of the <mcptt-Params> element of the <mcpttinfo> element contained in the application/vnd.3gpp.mcptt-info+xml MIME body contained in the received SIP MESSAGE request;

4) if according to local policy on-demand sessions are to be used for transfer of private calls, shall invoke the procedures of clause 11.1.1.2.1.1 to originate an MCPTT private call to the target MCPTT user; and

5) if according to local policy pre-established sessions are to be used for transfer of private calls and a pre-established session is available, shall invoke the procedures of clause 11.1.1.2.2.1 to originate an MCPTT private call to the target MCPTT user;

Upon completion of the procedures of clause 11.1.1.2.1.1 or clause 11.1.1.2.2.1, the MCPTT client:

1) shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [4] and IETF RFC 3428 [33] with the following clarifications:

a) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcptt" (coded as specified in 3GPP TS 24.229 [4]), in a P-Preferred-Service header field according to IETF RFC 6050 [9] in the SIP MESSAGE request;

b) shall include an Accept-Contact header field with the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcptt" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [6];

c) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [4];

d) shall include in an application/resource-lists+xml MIME body the MCPTT ID contained in the <mcptt-calling-user-id> element in the application/ vnd.3gpp.mcptt-info+xml MIME body of the received SIP MESSAGE request; and

e) shall include an application/vnd.3gpp.mcptt-info+xml MIME body as specified in clause F.1 with the <mcpttinfo> element containing the <mcptt-Params> element with the <anyExt> element containing:

i) the <response-type> element set to a value of "transfer-private-call-response";

ii) the <mcptt-called-party-id> set to the MCPTT ID of the target MCPTT user called by the transferred MCPTT user;

iii) if the procedures of clause 11.1.1.2.1.1 or clause 11.1.1.2.2.1 were successful in originating an MCPTT private call to the identified MCPTT user, a <transfer-call-outcome> element set to a value of "success"; and

iv) if the procedures of clause 11.1.1.2.1.1 or clause 11.1.1.2.2.1 were not successful in originating an MCPTT private call to the identified MCPTT user, a <transfer-call-outcome> element set to a value of "fail";

2) shall set the Request-URI to the public service identity identifying the participating MCPTT function serving the transferred MCPTT user; and

3) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [4].

\* \* \* Next Change \* \* \* \*

##### 11.1.8.2.3 Announced private call transfer

When the MCPTT user requests an announced private call transfer of an ongoing private MCPTT call, the MCPTT client:

1) shall put the ongoing MCPTT private call with the transferred MCPTT user on hold following the procedures as described in RFC 5359, clause 2.1.

2) shall initiate an on-demand private call as specified in clause 11.1.1.2.1, or a private call using pre-established session as specified in clause 11.1.1.2.2 to the target MCPTT user with the following clarification:

a) shall include an <transfer-announced-ind> element contained in the <anyExt> element of the <mcptt-Params> element of the <mcpttinfo> element contained in the application/vnd.3gpp.mcptt-info+xml MIME body;

2a) if present in the the 200 (OK) response received for the MCPTT call in step 2, shall copy content of the <replaces-header-value> element contained in the <anyExt> element of the <mcptt-Params> element of the <mcpttinfo> element contained in the application/vnd.3gpp.mcptt-info+xml MIME body;

3) once the call to the target MCPPT user is established, the MCPTT client should notify the requesting MCPTT user to announce the call transfer to the target MCPTT user;

4) if no <replaces-header-value> element was received in the <anyExt> element of the <mcptt-Params> element of the <mcpttinfo> element contained in the application/vnd.3gpp.mcptt-info+xml MIME body of the 200 (OK) response message in step 2a,;shall terminate the MCPTT private call with the target user as specified in clause 11.1.3; and

5) should offer the MCPTT user the option to retrieve the ongoing call with the transferred MCPTT user, to announce the transfer to the calling MCPTT user.

\* \* \* Next Change \* \* \* \*

## F.1.2 XML schema

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

<xs:schema

xmlns:xs="http://www.w3.org/2001/XMLSchema"

targetNamespace="urn:3gpp:ns:mcpttInfo:1.0"

xmlns:mcpttinfo="urn:3gpp:ns:mcpttInfo:1.0"

elementFormDefault="qualified"

attributeFormDefault="unqualified"

xmlns:xenc="[http://www.w3.org/2001/04/xmlenc#](http://www.w3.org/2001/04/xmlenc)"

xmlns:mgktp="urn:3gpp:ns:mcpttGKTP:1.0">

<xs:import namespace="http://www.w3.org/2001/04/xmlenc#"/>

<xs:import namespace="urn:3gpp:ns:mcpttGKTP:1.0"/>

<!-- root XML element -->

<xs:element name="mcpttinfo" type="mcpttinfo:mcpttinfo-Type" id="info"/>

<xs:complexType name="mcpttinfo-Type">

<xs:sequence>

<xs:element name="mcptt-Params" type="mcpttinfo:mcptt-ParamsType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="mcpttinfo:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="mcptt-ParamsType">

<xs:sequence>

<xs:element name="mcptt-access-token" type="mcpttinfo:contentType" minOccurs="0"/>

<xs:element name="session-type" type="xs:string" minOccurs="0"/>

<xs:element name="mcptt-request-uri" type="mcpttinfo:contentType" minOccurs="0"/>

<xs:element name="mcptt-calling-user-id" type="mcpttinfo:contentType" minOccurs="0"/>

<xs:element name="mcptt-called-party-id" type="mcpttinfo:contentType" minOccurs="0"/>

<xs:element name="mcptt-calling-group-id" type="mcpttinfo:contentType" minOccurs="0"/>

<xs:element name="required" type="mcpttinfo:contentType" minOccurs="0"/>

<xs:element name="emergency-ind" type="mcpttinfo:contentType" minOccurs="0"/>

<xs:element name="alert-ind" type="mcpttinfo:contentType" minOccurs="0"/>

<xs:element name="imminentperil-ind" type="mcpttinfo:contentType" minOccurs="0"/>

<xs:element name="broadcast-ind" type="xs:boolean" minOccurs="0"/>

<xs:element name="mc-org" type="xs:string" minOccurs="0"/>

<xs:element name="floor-state" type="xs:string" minOccurs="0"/>

<xs:element name="associated-group-id" type="xs:string" minOccurs="0"/>

<xs:element name="originated-by" type="mcpttinfo:contentType" minOccurs="0"/>

<xs:element name="MKFC-GKTPs" type="mgktp:singleTypeGKTPsType" minOccurs="0"/>

<xs:element name="mcptt-client-id" type="mcpttinfo:contentType" minOccurs="0"/>

<xs:element name="alert-ind-rcvd" type="mcpttinfo:contentType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="mcpttinfo:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:simpleType name="protectionType">

<xs:restriction base="xs:string">

<xs:enumeration value="Normal"/>

<xs:enumeration value="Encrypted"/>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="contentType">

<xs:choice>

<xs:element name="mcpttURI" type="xs:anyURI"/>

<xs:element name="mcpttString" type="xs:string"/>

<xs:element name="mcpttBoolean" type="xs:boolean"/>

<xs:any namespace="##other" processContents="lax"/>

<xs:element name="anyExt" type="mcpttinfo:anyExtType" minOccurs="0"/>

</xs:choice>

<xs:attribute name="type" type="mcpttinfo:protectionType"/>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="anyExtType">

<xs:sequence>

<xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

</xs:sequence>

</xs:complexType>

<!-- anyEXT elements – begin -->

<xs:element name="ambient-listening-type" type="mcpttinfo:ambientListeningType"/>

<xs:simpleType name="ambientListeningType">

<xs:restriction base="xs:string">

<xs:enumeration value="remote-init"/>

<xs:enumeration value="local-init"/>

</xs:restriction>

</xs:simpleType>

<xs:element name="release-reason" type="mcpttinfo:releaseReasonType"/>

<xs:simpleType name="releaseReasonType">

<xs:restriction base="xs:string">

<xs:enumeration value="private-call-expiry"/>

<xs:enumeration value="administrator-action"/>

<xs:enumeration value="not selected for call"/>

<xs:enumeration value="call-request-for-listened-to-client"/>

<xs:enumeration value="call-request-initiated-by-listened-to-client"/>

<xs:enumeration value="authentication of the MIKEY-SAKE I\_MESSAGE failed"/>

</xs:restriction>

</xs:simpleType>

<xs:element name="request-type" type="mcpttinfo:requestTypeType"/>

<xs:simpleType name="requestTypeType">

<xs:restriction base="xs:string">

<xs:enumeration value="private-call-call-back-request"/>

<xs:enumeration value="private-call-call-back-cancel-request"/>

<xs:enumeration value="group-selection-change-request"/>

<xs:enumeration value="remotely-initiated-group-call-request"/>

<xs:enumeration value="remotely-initiated-private-call-request"/>

<xs:enumeration value="transfer-private-call-request"/>

<xs:enumeration value="functional-alias-status-determination"/>

<xs:enumeration value="forward-private-call-request"/>

<xs:enumeration value="forward-private-call-settings-request"/>

<xs:enumeration value="forward-private-call-settings-response"/>

<xs:enumeration value="fa-group-binding-req"/>

</xs:restriction>

</xs:simpleType>

<xs:element name="response-type" type="mcpttinfo:responseTypeType"/>

<xs:simpleType name="responseTypeType">

<xs:restriction base="xs:string">

<xs:enumeration value="private-call-call-back-response"/>

<xs:enumeration value="private-call-call-back-cancel-response"/>

<xs:enumeration value="group-selection-change-response"/>

<xs:enumeration value="remotely-initiated-group-call-response"/>

<xs:enumeration value="remotely-initiated-private-call-response"/>

<xs:enumeration value="transfer-private-call-response"/>

<xs:enumeration value="forward-private-call-response"/>

</xs:restriction>

</xs:simpleType>

<xs:element name="urgency-ind">

<xs:simpleType>

<xs:restriction base="xs:string">

<xs:enumeration value="low"/>

<xs:enumeration value="normal"/>

<xs:enumeration value="high"/>

</xs:restriction>

</xs:simpleType>

</xs:element>

<xs:element name="time-of-request" type="xs:dateTime"/>

<xs:element name="selected-group-change-outcome" type="mcpttinfo:selectedGroupChangeOutcomeType"/>

<xs:simpleType name="selectedGroupChangeOutcomeType">

<xs:restriction base="xs:string">

<xs:enumeration value="success"/>

<xs:enumeration value="fail"/>

</xs:restriction>

</xs:simpleType>

<xs:element name="affiliation-required" type="xs:boolean"/>

<xs:element name="remotely-initiated-call-outcome" type="mcpttinfo:remotelyInitiatedCallOutcomeType"/>

<xs:simpleType name="remotelyInitiatedCallOutcomeType">

<xs:restriction base="xs:string">

<xs:enumeration value="success"/>

<xs:enumeration value="fail"/>

</xs:restriction>

</xs:simpleType>

<xs:element name="notify-remote-user" type="xs:boolean"/>

<xs:element name="functional-alias-URI" type="mcpttinfo:contentType"/>

<xs:element name="emergency-alert-area-ind" type="xs:boolean"/>

<xs:element name="group-geo-area-ind" type="xs:boolean"/>

<xs:element name="non-acknowledged-user" type="mcpttinfo:contentType"/>

<xs:element name="call-to-functional-alias-ind" type="xs:boolean"/>

<xs:element name="emergency-ind-rcvd" type="mcpttinfo:contentType"/>

<xs:element name="call-transfer-ind" type="xs:boolean"/>

<xs:element name="multiple-devices-ind" type="mcpttinfo:contentType"/>

<xs:element name="transfer-call-outcome" type="mcpttinfo:transferCallOutcomeType"/>

<xs:simpleType name="transferCallOutcomeType">

<xs:restriction base="xs:string">

<xs:enumeration value="success"/>

<xs:enumeration value="fail"/>

</xs:restriction>

</xs:simpleType>

<xs:element name="called-functional-alias-URI" type="mcpttinfo:contentType"/>

<xs:element name="call-forwarding-ind" type="xs:boolean"/>

<xs:element name="forwarding-call-outcome" type="mcpttinfo:forwardingCallOutcomeType"/>

<xs:simpleType name="forwardingCallOutcomeType">

<xs:restriction base="xs:string">

<xs:enumeration value="success"/>

<xs:enumeration value="fail"/>

</xs:restriction>

</xs:simpleType>

<xs:element name="forwarding-list" type="mcpttinfo:mcpttIdListType"/>

<xs:complexType name="mcpttIdListType">

<xs:choice minOccurs="0" maxOccurs="unbounded">

<xs:element name="entry" type="mcpttinfo:EntryType"/>

<xs:element name="anyExt" type="mcpttinfo:anyExtType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

</xs:choice>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="EntryType">

<xs:sequence>

<xs:element name="uri-entry" type="xs:anyURI"/>

<xs:element name="display-name" type="xs:string" minOccurs="0"/>

<xs:element name="anyExt" type="mcpttinfo:anyExtType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:element name="forwarding-reason" type="mcpttinfo:forwardingReasonType"/>

<xs:simpleType name="forwardingReasonType">

<xs:restriction base="xs:string">

<xs:enumeration value="Immediate"/>

<xs:enumeration value="No-Answer"/>

<xs:enumeration value="Manual-Input"/>

<xs:enumeration value="User-Not-Available"/>

</xs:restriction>

</xs:simpleType>

<xs:element name="call-forwarding-immediate-enabled" type="xs:boolean"/>

<xs:element name="call-forwarding-no-answer-enabled" type="xs:boolean"/>

<xs:element name="call-forwarding-user-unavailable-enabled" type="xs:boolean"/>

<xs:element name="call-forwarding-target-id" type="mcpttinfo:contentType"/>

<xs:element name="call-forwarding-target-display-name" type="mcpttinfo:contentType"/>

<xs:element name="call-forwarding-target-is-functional-alias" type="xs:boolean"/>

<xs:element name="forwarded-by-client-ID" type="mcpttinfo:contentType"/>

<xs:element name="forwarded-by-client-display-name" type="mcpttinfo:contentType"/>

<xs:element name="binding-ind" type="xs:boolean"/>

<xs:element name="binding-fa-uri" type="xs:anyURI"/>

<xs:element name="unbinding-fa-uri" type="xs:anyURI"/>

<xs:element name="replaces-header-value" type="xs:string"/>

<xs:element name="transfer-announced-ind" type="xs:boolean"/>

<!-- anyEXT elements – end -->

</xs:schema>

\* \* \* Next Change \* \* \* \*

## F.1.3 Semantic

The <mcpttinfo> element is the root element of the XML document. The <mcpttinfo> element can contain subelements.

NOTE 1: The subelements of the <mcpttinfo> are validated by the <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/> particle of the <mcpttinfo> element

If the <mcpttinfo> contains the <mcptt-Params> element then:

1) the <mcptt-access-token>, <mcptt-request-uri>, <mcptt-calling-user-id>, <mcptt-called-party-id>, <mcptt-calling-group-id>, <emergency-ind>, <alert-ind>, <imminentperil-ind>, <originated-by>, <mcptt-client-id>, <functional-alias-URI>, <called-functional-alias-URI>, <non-acknowledged-user>, <call-forwarding-target-ID>, <call-forwarding-target-display-name>, <forwarded-by-client-ID>, <forwarded-by-client-display-name> and <multiple-devices-ind> elements can be included with encrypted content;

2) for each element in 1) that is included with content that is not encrypted:

a) the element has the "type" attribute set to "Normal";

b) if the element is one of the following elements: <mcptt-request-uri>, <mcptt-calling-user-id>, <mcptt-called-party-id>, <mcptt-calling-group-id>, <originated-by>, <functional-alias-URI>, <called-functional-alias-URI> or <non-acknowledged-user>, then the <mcpttURI> element is included;

c) if the element is one of the following elements:<mcptt-access-token> or <mcptt-client-id>, then the <mcpttString> element is included; and

d) if the element is one of the following elements: <emergency-ind>, <alert-ind>, <alert-ind-rcvd>, <imminentperil-ind>, <emergency-ind-rcvd> or <multiple-devices-ind>, then the <mcpttBoolean> element is included;

3) for each element in 1) that is included with content that is encrypted:

a) the element has the "type" attribute set to "Encrypted";

b) the <xenc:EncryptedData> element from the "[http://www.w3.org/2001/04/xmlenc#](http://www.w3.org/2001/04/xmlenc)" namespace is included and:

i) can have a "Type" attribute can be included with a value of "<http://www.w3.org/2001/04/xmlenc#Content>";

ii) can include an <EncryptionMethod> element with the "Algorithm" attribute set to value of "http://www.w3.org/2009/xmlenc11#aes128-gcm";

iii) can include a <KeyInfo> element with a <KeyName> element containing the base 64 encoded XPK-ID; and

iv) includes a <CipherData> element with a <CipherValue> element containing the encrypted data.

NOTE 2: When the optional attributes and elements are not included within the <xenc:EncryptedData> element, the information they contain is known to sender and the receiver by other means.

If the <mcpttinfo> contains the <mcptt-Params> element then:

1) the <mcptt-access-token> can be included with the access token received during authentication procedure as described in 3GPP TS 24.482 [49];

2) the <session-type> can be included with:

a) a value of "chat" to indicate that the MCPTT client wants to join a chat group call

b) a value of "prearranged" to indicate the MCPTT client wants to make a prearranged group call;

c) a value of "private" to indicate the MCPTT client wants to make a private call;

d) a value of "first-to-answer" to indicate that the MCPTT client wants to make a first-to-answer call; or

e) a value of "ambient-listening" to indicate the MCPTT client wants to make an ambient listening call;

3) the <mcptt-request-uri> can be included with:

a) a value set to an MCPTT group ID or temporary MCPTT group ID when the <session-type> is set to a value of "prearranged" or "chat"; and

b) a value set to the MCPTT ID of the called MCPTT user when the <session-type> is set to a value of "private";

4) the <mcptt-calling-user-id> can be included, set to MCPTT ID of the originating user;

5) the <mcptt-called-party-id> can be included, set to the MCPTT ID of the terminating user;

6) the <mcptt-calling-group-id> can be included to indicate the MCPTT group identity to the terminating user;

7) the <required> can be included in a SIP 183 (Session Progress) from a non-controlling MCPTT function of an MCPTT group to inform the controlling MCPTT function that the group on the non-controlling MCPTT function has group members in the group document which are marked as <on-network-required>, as specified in 3GPP TS 24.481 [31];

8) the <emergency-ind> can be:

a) set to "true" to indicate that the call that the MCPTT client is initiating is an emergency MCPTT call; or

b) set to "false" to indicate that the MCPTT client is cancelling an emergency MCPTT call (i.e. converting it back to a non-emergency call)

9) the <alert-ind> can be:

a) set to "true" in an emergency call initiation to indicate that an alert to be sent; or

b) set to "false" when cancelling an emergency call which requires an alert to be cancelled also

10) if the <session-type> is set to "chat" or "prearranged":

a) the <imminentperil-ind> can be set to "true" to indicate that the call that the MCPTT client is initiating is an imminent peril group MCPTT call;

11) the <broadcast-ind> can be:

a) set to "true" indicates that the MCPTT client is initiating a broadcast group call; or

b) set to "false" indicates that the MCPTT client is initiating a non-broadcast group call;

12) the <mc-org> can be:

a) set to the MCPTT user's Mission Critical Organization in an emergency alert sent by the MCPTT server to terminating MCPTT clients;

13) the <floor-state> can be:

a) set to "floor-idle", if the floor is idle in a non-controlling MCPTT function; or

b) set to "floor-taken" if the floor state in a non-controlling MCPTT function is taken;

14) the <associated-group-id>:

a) if the <mcptt-request-uri> element contains a group identity then this element can include an MCPTT group ID associated with the group identity in the <mcptt-request-uri> element. E.g. if the <mcptt-request-uri> element contains a temporary group identity (TGI), then the <associated-group-id> element can contain the constituent MCPTT group ID;

15) the <originated-by>:

a) can be included, set to the MCPTT ID of the originating user of an MCPTT emergency alert when being cancelled by another authorised MCPTT user;

16) the <MKFC-GKTPs>:

a) contains a group key transport payload carrying one or more MKFC(s) and MKFC-ID(s) as described in3GPP TS 24.481 [31] clause 7.4, to be used for protection of multicast floor control signalling when the UE operates on the network;

17) the <mcptt-client-id>:

a) can be included, set to the MCPTT client ID of the MCPTT client that originated a SIP INVITE request, SIP REFER request, SIP REGISTER request, SIP PUBLISH request or SIP MESSAGE request;

18) the <alert-ind-rcvd>

a) can be set to true and included in a SIP MESSAGE to indicate that the emergency alert or cancellation was received successfully; and

19) the <anyExt> can be included with the following elements:

a) an <ambient-listening-type> element set to:

i) "remote-init" when the listening MCPTT user of an ambient listening call initiates the call; or

ii) "local-init" when the listened-to MCPTT user of an ambient listening call initiates the call;

b) a <release-reason> element set to:

i) "private-call-expiry" when the ambient listening call is release due to the expiry of the private call timer;

ii) "administrator-action" when the ambient listening call is released by an MCPTT administrator;

iii) "not selected for call" when the when a dialog is released with an MCPTT client that was not selected as the terminating client of a first-to-answer call;

iv) "call-request-for-listened-to-client" when there is a call request targeted to the listened-to client;

v) "call-request-initiated-by-listened-to-client" when there is a call request initiated by the listened-to client; or

vi) "authentication of the MIKEY-SAKE I\_MESSAGE failed" by a MCPTT client when the signature cannot be verified;

c) a <request-type> element set to:

i) "private-call-call-back-request" when a client initiates a private call call-back request;

ii) "private-call-call-back-cancel-request" when a client initiates a private call call-back cancel request;

iii) "group-selection-change-request" when a client initiates a group selection change request;

iv) "remotely-initiated-group-call-request" when a client initiates a remotely initiated group call request;

v) "remotely-initiated-private-call-request" when a client initiates a remotely initiated private call request;

vi) "transfer-private-call-request" when a client initiates a transfer private call request;

vii) "functional-alias-status-determination" when a client initiates a subscription to FA status determination request;

viii) "forward-private-call-request" when a client initiates a forward private call request; or

ix) "fa-group-binding-req" when a client initiates a request for binding of a functional alias with the MCPTT group(s) for the MCPTT user;

d) a <response-type> element set to:

i) "private-call-call-back-response" when a client responds to a private call call-back request;

ii) "private-call-call-back-cancel-response" when a client responds to a private call call-back cancel request;

iii) "group-selection-change-response" when a client responds to a group selection change request;

iv) "remotely-initiated-group-call-response" when a client responds to a remotely initiated call request;

v) "remotely-initiated-private-call-response" when a client responds to a remotely initiated private call request;

vi) "transfer-private-call-response" when a client responds to a transfer private call request;

vii) "forward-private-call-response" when a client responds to a forward private call request; or

e) an <urgency-ind> element:

i) set to a value of "low", "normal" or "high" to indicate the urgency of a private call call-back request;

f) a <time-of-request> element :

i) set to the date and time at which the private call call-back request was initiated, in the form: "YYYY-MM-DDThh:mm:ss" where:

- YYYY indicates the year;

- MM indicates the month;

- DD indicates the day;

- T indicates the start of the required time section;

- hh indicates the hour;

- mm indicates the minute; and

- ss indicates the second;

g) a <selected-group-change-outcome> element set to:

i) "success" when a client reports that it has successfully changed its selected group as requested by a received group selection change request; or

ii) "fail" when a client reports that it has failed to change its selected group as requested by a received group selection change request;

h) an <affiliation-required> element set to:

i) "true" when received by a client in a group-selection-change-request indicates that the client needs to affiliate to the specified group;

i) a <remotely-initiated-call-outcome> element set to:

i) "success" when a client reports that it has successfully initiated a call requested by a received remotely initiated call request; or

ii) "fail" when a client reports that it has failed to initiated a call triggered as requested by a received group selection change request;

j) a <notify-remote-user> element set to:

i) "true" when the remote user is to be notified of a remotely initiated call request; or

ii) "false" when the remote user is to be notified of a received remotely initiated call request;

k) a <functional-alias-URI> element set to the value of the functional alias that is used together with the "mcptt-calling-user-id";

l) an <emergency-alert-area-ind> element set to:

i) "true" when the MCPTT client has entered an emergency alert area; or

ii) "false" when the MCPTT client has exited an emergency alert area;

m) a <group-geo-area-ind> element set to:

i) "true" when the MCPTT client has entered a group geographic area; or

ii) "false" when the MCPTT client has exited a group geographic area;

n) one or more <non-acknowledged-user> elements set to the MCPTT IDs of invited members to a group call that have not sent a SIP 200 (OK) response;

o) a <call-to-functional-alias-ind> element set to:

i) "true" when the MCPTT client is using a functional alias to identify the MCPTT IDs of the potential target MCPTT users; or

ii) "false" when the MCPTT client is using MCPTT IDs to identify the potential target MCPTT users;

p) the <emergency-ind-rcvd> element set to:

i) "true" and included in a SIP MESSAGE to indicate that the in-progress emergency cancellation request was received successfully;

q) a <call-transfer-ind> element set to:

i) "true" when the MCPTT client is making a private call as a result of a call transfer; or

ii) "false" when the MCPTT client is making a normal private call;

r) a <transfer-call-outcome> element set to:

i) "success" when a client reports that it has successfully initiated a call requested by a received call transfer request; or

ii) "fail" when a client reports that it has failed to initiated a call triggered as requested by a received call transfer request;

s) a <called-functional-alias-URI> element set to the value of the functional alias to be called;

t) a <call-forwarding-ind> element set to:

i) "true" when the MCPTT client is making a private call as a result of a call forwarding; or

ii) "false" when the MCPTT client is making a normal private call;

u) a <forwarding-call-outcome> element set to:

i) "success" when a client reports that it has successfully initiated a call requested by a received call forwarding request; or

ii) "fail" when a client reports that it has failed to initiate a call triggered as requested by a received call forwarding request;

v) a <forwarding-list> element;

w) a <forwarding-reason> element set to:

i) "Immediate" for call forwarding immediate;

ii) "No-Answer" for call forwarding no answer;

iii) "Manual-Input" for call forwarding based on manual user input; or

iv) "User-Not-Available" for call forwarding when the user is not registered;

x) a <multiple-devices-ind> element set to:

i) "true" to indicate to the client that multiple clients are registered for the MCPTT user; or

ii) "false" to indicate to the client that no other clients are registered for the MCPTT user;

y) a <call-forwarding-immediate-enabled> element set to:

i) "true" when the MCPTT client requests that call forwarding immediate be enabled; or

ii) "false" when the MCPTT client requests that call forwarding immediate be disabled;

z) a <call-forwarding-no-answer-enabled> element set to:

i) "true" when the MCPTT client requests that call forwarding no answer be enabled; or

ii) "false" when the MCPTT client requests that call forwarding no answer be disabled;

aa) a <call-forwarding-no-answer-enabled> element set to:

i) "true" when the MCPTT client requests that call forwarding no answer be enabled; or

ii) "false" when the MCPTT client requests that call forwarding no answer be disabled;

ab) a <call-forwarding-user-unavailable-enabled> element set to:

i) "true" when the MCPTT client requests that call forwarding when the user is not available be enabled; or

ii) "false" when the MCPTT client requests that call forwarding when the user is not available be disabled;

ac) a <call-forwarding-target-id> element that contains:

i) an MCPTT ID of a forwarded-to-client; or

ii) a functional alias;

ad) a <call-forwarding-target-display-name> element that contains a displayable string describing the "call-forwarding-target-id";

ae) a <call-forwarding-target-is-functional-alias> element set to:

i) "true" to indicate that the value of the <call-forwarding-target-id> element is a functional alias; or

ii) "false" to indicate that the value of the <call-forwarding-target-id> element is an MCPTT ID;

af) a <forwarded-by-client-ID> element that contains the MCPTT ID of the forwarded-by-client;

ag) a <forwarded-by-client-display-name> element that contains the display name associated with the MCPTT ID of the forwarded-by-client;

ah) a <binding-ind> element set to:

i) "true" when the user wants to create a binding of a particular functional alias with the specified list of MCPTT groups for the MCPTT client; or

ii) "false" when the user wants to remove a binding of a particular functional alias from the specified list of MCPTT groups for the MCPTT client;

ai) a <binding-fa-uri> element set to:

i) a URI of a functional alias that shall be bound with the specified list of MCPTT groups for the MCPTT client;

aj) a <unbinding-fa-uri> element set to:

i) a URI of a functional alias that shall be unbound from the specified list of MCPTT groups for the MCPTT client;

ak) a <transfer-announced-ind> set to:

i) "true"indicating that the call is part of an announced MCPTT call transfer; or

ii) "false" indicating that the call is not part of an announced MCPTT call transfer;

al) a<replaces-header-value> element set to the Call-ID SIP header field value, the from-tag, and the to-tag of the MCPTT private call to be transferred. The delimiter between the Call-ID, the from-tag, and the to-tag is the semicolon (;).

Absence of the <emergency-ind>, <alert-ind> and <imminentperil-ind> in a SIP INVITE or a SIP REFER request indicates that the MCPTT client is initiating a non-emergency private call or non-emergency group call.

Absence of the <broadcast-ind> in a SIP INVITE or a SIP REFER request indicates that the MCPTT client is initiating a non-broadcast group call.

Absence of the <floor-state> in a SIP 200 (OK) response from the non-controlling MCPTT function indicates that the floor is idle.

Absence of the <call-to-functional-alias-ind> in a SIP INVITE or a SIP REFER request for a first-to-answer call indicates the use of the MCPTT IDs of the potential target MCPTT users.

Absence of the <call-transfer-ind> in a SIP INVITE or a SIP REFER request for a private call indicates that the call is not caused by a request for call transfer.

Absence of the <call-forwarding-ind> in a SIP INVITE or a SIP REFER request for a private call indicates that the call is not caused by a request for call forwarding.

Absence of the <transfer-announced-ind> in a SIP INVITE or a SIP REFER request for a private call indicates that the call is not part of a announced call transfer.

The recipient of the XML ignores any unknown element and any unknown attribute.

\* \* \* Next Change \* \* \* \*

\* \* \* End of Changes \* \* \* \*