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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

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- x the first digit:
 - 1 presented to TSG for information;
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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

1 Scope

The present document specifies the signalling control needed to support Mission Critical Video (MCVideo) service.

The MCVideo service and its associated media plane control protocols can be used for public safety applications and also for general commercial applications (e.g., utility companies and railways).

The present document is applicable to User Equipment (UE) supporting MCVideo client, and MCVideo server.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] IETF RFC 4566 (July 2006): "Session Description Protocol".
- [3] IETF RFC 3605 (October 2003): "Real Time Control Protocol (RTCP) attribute in Session Description Protocol (SDP)".
- [4] 3GPP TS 24.483: "Mission Critical Services (MCS) Management Object (MO)".
- [5] 3GPP TS 24.581: "Mission Critical Video (MCVideo) media plane control Protocol specification".
- [6] IETF RFC 4567 (July 2006): "Key Management Extensions for Session Description Protocol (SDP) and Real Time Streaming Protocol (RTSP)".
- [7] IETF RFC 3264 (June 2002): "An Offer/Answer Model with the Session Description Protocol (SDP)".
- [8] 3GPP TS 33.180: "Security of the mission critical service".
- [9] 3GPP TS 29.199-9: "Open Service Access (OSA); Parlay X Web Services; Part 9: Terminal location".
- [10] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".
- [11] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".
- [12] IETF RFC 3903 (October 2004): "Session Initiation Protocol (SIP) Extension for Event State Publication".
- [13] IETF RFC 3856 (August 2004): "A Presence Event Package for the Session Initiation Protocol (SIP)".
- [14] IETF RFC 6050 (November 2010): "A Session Initiation Protocol (SIP) Extension for the Identification of Services".
- [15] IETF RFC 3261 (June 2002): "SIP: Session Initiation Protocol".
- [16] IETF RFC 6665 (July 2012): "SIP-Specific Event Notification".

- [17] IETF RFC 3428 (December 2002): "Session Initiation Protocol (SIP) Extension for Instant Messaging".
- [18] IETF RFC 3863 (August 2004): "Presence Information Data Format (PIDF)".
- [19] IETF RFC 4661 (September 2006): "An Extensible Markup Language (XML)-Based Format for Event Notification Filtering".
- [20] IETF RFC 3841 (August 2004): "Caller Preferences for the Session Initiation Protocol (SIP)".
- [21] IETF RFC 6086 (January 2011): "Session Initiation Protocol (SIP) INFO Method and Package Framework".
- [22] IETF RFC 3840 (August 2004): "Indicating User Agent Capabilities in the Session Initiation Protocol (SIP)".
- [23] IETF RFC 4028 (April 2005): "Session Timers in the Session Initiation Protocol (SIP)".
- [24] 3GPP TS 24.481: "Mission Critical Services (MCS) group management; Protocol specification".
- [25] 3GPP TS 24.484: "Mission Critical Services (MCS) configuration management; Protocol specification".
- [26] 3GPP TS 23.281: "Functional architecture and information flows to support Mission Critical Video (MCVideo); Stage 2".
- [27] IETF RFC 5373 (November 2008): "Requesting Answering Modes for the Session Initiation Protocol (SIP)".
- [28] IETF RFC 5318 (December 2008): "The Session Initiation Protocol (SIP) P-Refused-URI-List Private-Header (P-Header)".
- [29] IETF RFC 4483 (May 2006): "A Mechanism for Content Indirection in Session Initiation Protocol (SIP) Messages".
- [30] IETF RFC 4964 (September 2007): "The P-Answer-State Header Extension to the Session Initiation Protocol for the Open Mobile Alliance Push to Talk over Cellular".
- [31] IETF RFC 4488 (May 2006): "Suppression of Session Initiation Protocol (SIP) REFER Method Implicit Subscription".
- [32] IETF RFC 4538 (June 2006): "Request Authorization through Dialog Identification in the Session Initiation Protocol (SIP)".
- [33] IETF RFC 4412 (February 2006): "Communications Resource Priority for the Session Initiation Protocol (SIP)".
- [34] IETF RFC 4567 (July 2006): "Key Management Extensions for Session Description Protocol (SDP) and Real Time Streaming Protocol (RTSP)".
- [35] IETF RFC 5626 (October 2009): "Managing Client-Initiated Connections in the Session Initiation Protocol (SIP)".
- [36] 3GPP TS 22.281: "Mission Critical Video over LTE".
- [37] IETF RFC 5366 (October 2008): "Conference Establishment Using Request-Contained Lists in the Session Initiation Protocol (SIP)".
- [38] IETF RFC 8101 (March 2017): "IANA Registration of New Session Initiation Protocol (SIP) Resource-Priority Namespace for Mission Critical Push To Talk Service".
- [39] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [40] 3GPP TS 24.379: "Mission Critical Push To Talk (MCPTT) call control Protocol specification".
- [41] IETF RFC 5627 (October 2009): "Obtaining and Using Globally Routable User Agent URIs (GRUUs) in the Session Initiation Protocol (SIP)".

- [42] 3GPP TS 24.581: "Mission Critical Video (MCVideo) media plane control; Protocol specification".
- [43] IETF RFC 8101 (March 2017): "IANA Registration of New Session Initiation Protocol (SIP) Resource-Priority Namespace for Mission Critical Push To Talk Service".
- [44] 3GPP TS 29.468 "Group Communication System Enablers for LTE (GCSE_LTE); MB2 reference point; Stage 3".
- [45] W3C: "XML Encryption Syntax and Processing Version 1.1", <https://www.w3.org/TR/xmlenc-core1/>.
- [46] IETF RFC 4648 (October 2006): "The Base16, Base32, and Base64 Data Encodings".
- [47] 3GPP TS 23.003: "Numbering, addressing and identification".
- [48] IETF RFC 2045 (November 1996): "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".
- [49] IETF RFC 2392 (August 1998): "Content-ID and Message-ID Uniform Resource Locators".
- [50] W3C: "XML Signature Syntax and Processing (Second Edition)", <http://www.w3.org/TR/xmldsig-core/>
- [51] 3GPP TS 24.379: "Mission Critical Push to Talk (MCPTT) call control Protocol specification".
- [52] 3GPP TS 24.482: "Mission Critical Services (MCS) identity management Protocol specification".
- [53] IETF RFC 4354 (January 2006): "A Session Initiation Protocol (SIP) Event Package and Data Format for Various Settings in Support for the Push-to-Talk over Cellular (PoC) Service".
- [54] 3GPP TS 29.283: "Diameter Data Management Applications".
- [55] IETF RFC 6509 (February 2012): "MIKEY-SAKKE: Sakai-Kasahara Key Encryption in Multimedia Internet KEYing (MIKEY)".
- [56] IETF RFC 4567 (July 2006): "Key Management Extensions for Session Description Protocol (SDP) and Real Time Streaming Protocol (RTSP)".
- [57] IETF RFC 4575 (August 2006): "A Session Initiation Protocol (SIP) Event Package for Conference State".
- [58] IETF RFC 4122 (July 2005): "A Universally Unique Identifier (UUID) URN Namespace".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

3.2 Symbols

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

4 General

4.1 MCVideo overview

Editor's Note: this section will provide a brief description of the MCVideo service, including on-network and off-network overview. This section will also include cross reference to other mission critical specifications to guide the reader through the key mission critical specifications that this document refers to.

4.2 URI and address assignments

In order to support MCVideo, the following URI and address assignments are assumed:

- 1) the participating MCVideo function is configured to be reachable using:
 - a) the public service identity of the participating MCVideo function serving the MCVideo user.

4.4 Warning header field

4.4.1 General

The MCVideo server can include a free text string in a SIP response to a SIP request. When the MCVideo server includes a text string in a response to a SIP INVITE request the text string is included in a Warning header field as specified in IETF RFC 3261 [15]. The MCVideo server includes the Warning code set to 399 (miscellaneous warning) and includes the host name set to the host name of the MCVideo server.

EXAMPLE: Warning: 399 "100 User not authorised to make group calls"

4.4.2 Warning texts

The text string included in a Warning header field consists of an explanatory text preceded by a 3-digit text code, according to the following format in Table 4.4.2-1.

Table 4.4.2-1 ABNF for the Warning text

```
warn-text      = / DQUOTE mcvideo-warn-code SP warn-mcvideo-text DQUOTE
mcvideo-warn-code = DIGIT DIGIT DIGIT
mcvideo-warn-text = *( qdtext | quoted-pair )
```

Table 4.4.2-2 defines the warning texts that are defined for the Warning header field when a Warning header field is included in a response to a SIP INVITE request as specified in subclause 4.4.1.

Table 4.4.2-2: Warning texts defined for the Warning header field

Code	Explanatory text	Description
100	function not allowed due to <detailed reason>	The function is not allowed to this user. The <detailed reason> will be either "group definition", "access policy", "local policy", or "user authorisation", or can be a free text string.
101	service authorisation failed	The service authorisation of the MCVideo ID against the IMPU failed at the MCVideo server.
102	too many simultaneous affiliations	The MCVideo user already has N2 maximum number of simultaneous affiliations.
103	maximum simultaneous MCVideo group calls reached	The number of maximum simultaneous MCVideo group calls supported for the MCVideo user has been exceeded.
104	isfocus not assigned	A controlling MCVideo function has not been assigned to the MCVideo session.
105	subscription not allowed in a broadcast group call	Subscription to the conference event package rejected during a group call initiated as a broadcast group call.
106	user not authorised to join chat group	The MCVideo user is not authorised to join this chat group.
107	user not authorised to make private calls	The MCVideo user is not authorised to make private calls.
108	user not authorised to make chat group calls	The MCVideo user is not authorised to make chat group calls.
109	user not authorised to make prearranged group calls	The MCVideo user is not authorised to make group calls to a prearranged group.
110	user declined the call invitation	The MCVideo user declined to accept the call.
111	group call proceeded without all required group members	The required members of the group did not respond within the acknowledged call time, but the call still went ahead.
112	group call abandoned due to required group members not part of the group session	The group call was abandoned, as the required members of the group did not respond within the acknowledged call time.
113	group document does not exist	The group document requested from the group management server does not exist.
114	unable to retrieve group document	The group document exists on the group management server but the MCVideo server was unable to retrieve it.
115	group is disabled	The group has the <disabled> element set to "true" in the group management server.
116	user is not part of the MCVideo group	The group exists on the group management server but the requesting user is not part of this group.
117	the group identity indicated in the request is a prearranged group	The group id that is indicated in the request is for a prearranged group, but did not match the request from the MCVideo user.
118	the group identity indicated in the request is a chat group	The group id that is indicated in the request is for a chat group, but did not match the request from the MCVideo user,
119	user is not authorised to initiate the group call	The MCVideo user identified by the MCVideo ID is not authorised to initiate the group call.
120	user is not affiliated to this group	The MCVideo user is not affiliated to the group.
121	user is not authorised to join the group call	The MCVideo user identified by the MCVideo ID is not authorised to join the group call.
122	too many participants	The group call has reached its maximum number of participants.
123	MCVideo session already exists	Inform the MCVideo user that the group call is currently ongoing.

124	maximum number of private calls reached	The maximum number of private calls allowed at the MCVideo server for the MCVideo user has been reached.
125	user not authorised to make private call with automatic commencement	The MCVideo user is not authorised to make a private call with automatic commencement.
126	user not authorised to make private call with manual commencement	The MCVideo user is not authorised to make a private call with manual commencement.
127	user not authorised to be called in private call	The called MCVideo user is not allowed to be part of a private call.
128	isfocus already assigned	The MCVideo server owning an MCVideo group received a SIP INVITE request destined to the MCVideo group from another MCVideo server already assigned as the controlling MCVideo function and the MCVideo server owning the MCVideo group does not support mutual aid or supports trusted mutual aid but does not authorise trusted mutual aid.
137	the indicated group call does not exists	The participating MCVideo function cannot find an ongoing group session associated with the received MCVideo session identity.
138	subscription of conference events not allowed	The controlling MCVideo function could not allow the MCVideo user to subscribe to the conference event package.
139	integrity protection check failed	The integrity protection of an XML MIME body failed.
140	unable to decrypt XML content	The XML content cannot be decrypted.
141	user unknown to the participating function	The participating function is unable to associate the public user identity with an MCVideo ID.
142	unable to determine the controlling function	The participating function is unable to determine the controlling function for the group call or private call.
143	not authorised to force auto answer	The calling user is not authorised to force auto answer on the called user.
144	user not authorised to call this particular user	The calling user is not authorised to call this particular called user.
145	unable to determine called party	The participating function was unable to determine the called party from the information received in the SIP request.
146	T-PF unable to determine the service settings for the called user	The service settings have not been uploaded by the terminating client to the terminating participating server.
147	user is authorized to initiate a temporary group call	The non-controlling MCVideo function has authorized a request from the controlling MCVideo function to authorize a user to initiate an temporary group session.
148	MCVideo group is regrouped	The MCVideo group hosted by a non-controlling MCVideo function is part of a temporary group session as the result of the group regroup function.
149	SIP-INFO request pending	The MCVideo client needs to wait for a SIP-INFO request with specific content, before taking further action.
150	invalid combinations of data received in MIME body	The MCVideo client included invalid combinations of data in the SIP request.
151	user not authorised to make a private call call-back request	The MCVideo user is not authorised to make a private call call-back request.
152	user not authorised to make a private call call-back cancel request	The MCVideo user is not authorised to make a private call call-back cancel request.
153	user not authorised to call any of the users requested in the first-to-answer call	All users that were invited in the first-to-answer call cannot be involved in a private call with the inviting user.

154	user not authorised to make ambient listening call	The MCVideo user is not authorised to make an ambient listening call.
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4.5 MCVideo session identity

The MCVideo session identity is a SIP URI, which identifies the MCVideo session between:

- the MCVideo client and the participating MCVideo function; and
- the participating MCVideo function and the controlling MCVideo function;

The MCVideo session identity shall be a GRUU as defined in IETF RFC 5627 [41] assigned by the MCVideo server as per 3GPP TS 24.229 [11].

The MCVideo session identity identifies the MCVideo session in such a way that e.g.:

- the MCVideo user is able to subscribe to the participant information of the ongoing MCVideo session;
- the MCVideo user is able to re-join an ongoing MCVideo session; and
- the IM CN subsystem is able to route an initial SIP request to the controlling MCVideo function.

The controlling MCVideo function allocates a unique MCVideo session identity hosted at the controlling MCVideo function for the MCVideo session at the time of session establishment.

When protection of sensitive application data is required by the MCVideo operator, the MCVideo session identity cannot contain identity information that is classed as sensitive such as the MCVideo ID or the MCVideo Group ID, as specified in subclause 4.8.

The controlling MCVideo function sends the MCVideo session identity towards the MCVideo client during MCVideo session establishment by including it in the Contact header field of the final SIP response to a session initiation request.

The participating MCVideo function allocates a unique MCVideo session identity hosted at the participating MCVideo function for the MCVideo session when it receives a MCVideo session identity in the Contact header field of a SIP request or a SIP response from the controlling MCVideo function and includes it in the Contact header field of the SIP request or SIP response sent towards the MCVideo client. The participating MCVideo function maintains a mapping of the MCVideo session identities it sends to the MCVideo client to the corresponding MCVideo session identities received from the controlling MCVideo function.

The MCVideo client can cache the MCVideo session identity until a time when it is no longer needed.

The MCVideo session identity is also used in transmission control requests and responses as specified in 3GPP TS 24.581 [42].

4.6 MCVideo priority calls and alerts

4.6.1 MCVideo emergency group calls

MCVideo emergency group calls as defined by 3GPP TS 23.281 [26] are supported by the procedures in this specification. The following MCVideo emergency group call functionalities are described:

- MCVideo emergency group call origination;
- upgrade of an MCVideo group call to an MCVideo emergency group call; and
- in-progress group emergency cancel.

NOTE 1: In-progress group emergency cancel means the cancellation of the in-progress emergency state of the group, which is managed by the controlling MCVideo function.

The above functionalities are supported using both MCVideo prearranged group calls and MCVideo chat group calls.

Key aspects of MCVideo emergency group calls include:

- adjusted EPS bearer priority for all participants whether or not they themselves are in an emergency condition (i.e. have their MCVideo emergency state set). For unicast bearers this is achieved by using the Resource-Priority header field as specified in IETF RFC 4412 [33] with namespaces defined for use by MCVideo specified in IETF RFC 8101 [43], and for MBMS bearers this is achieved by having the participating MCVideo function adjust the ARP (priority, PVI, PCI) and executing the Modify MBMS Bearer Procedure per 3GPP TS 29.468 [44];
- pre-emptive transmission control priority over MCVideo users in MCVideo emergency group calls who themselves do not have their MCVideo emergency state set;
- restoration of normal EPS bearer priority to the call participants when the in-progress emergency group state is cancelled;
- restoration of normal transmission control priority participants when the in-progress emergency group state is cancelled;
- requires the MCVideo user to be authorised to either originate or cancel an MCVideo emergency group call;
- requests to originate MCVideo emergency group calls may also include an indication of an MCVideo emergency alert; and
- requests to cancel MCVideo emergency group calls may also include an indication of cancelling a previously issued MCVideo emergency alert.

There are a number of states that are key in managing these aspects of MCVideo emergency group calls, which include:

- **MCVideo emergency state:** as defined in 3GPP TS 22.281 [36] and 3GPP TS 23.281 [26], indicates that the MCVideo user is in a life-threatening situation. Managed by the MCVideo user of the device or an authorised MCVideo user. While the MCVideo emergency state is set on the client, all calls originated by the client will be MCVideo emergency calls, assuming the MCVideo user is authorised for MCVideo emergency calls on them.
- **in-progress emergency group state:** as defined in 3GPP TS 22.281 [36] and 3GPP TS 23.281 [26], indicates whether or not there is an MCVideo emergency group call ongoing on the specified group. This state is managed by the controlling MCVideo function. All group calls originated on this MCVideo group when in an in-progress emergency state are MCVideo emergency group calls until this state is cancelled, whether or not the originator is themselves in an MCVideo emergency state.
- **MCVideo emergency group (MVEG) state:** this is an internal state managed by the MCVideo client which tracks the in-progress emergency state of the group as defined in 3GPP TS 22.281 [36] and 3GPP TS 23.281 [26] and managed by the controlling MCVideo function. Ideally, the MCVideo client would not need to track the in-progress emergency group state, but doing so enables the MCVideo client to request MCVideo emergency-level priority earlier than otherwise possible. For example, if the MCVideo user wishes to join an MCVideo emergency group call and is not in MCVideo emergency state itself, the MCVideo client should have emergency level priority. If it has knowledge of the in-progress emergency state of the group, it can request priority by including a Resource-Priority header field set to the MCVideo namespace specified in draft-holmberg-dispatch-mcptt-rp-namespace [48], and appropriate priority level in the SIP INVITE request (or SIP re-INVITE request).
- **MCVideo emergency group call (MVEGC) state:** this is an internal state managed by the MCVideo client which in conjunction with the MCVideo emergency alert state aids in managing the MCVideo emergency state and related actions.
- **MCVideo emergency alert (MEA) state:** this is also an internal state of the MCVideo client which in conjunction with the MCVideo emergency group call state aids in managing the MCVideo emergency state and related actions.

NOTE 2: The above states and their transitions are described in Annex G.

4.6.2 MCVideo emergency private calls

MCVideo emergency private calls as defined by 3GPP TS 23.281 [26] are supported by the procedures in this specification. The following MCVideo emergency private call functionalities are specified in the present document:

- MCVideo emergency private call origination with optional MCVideo emergency alert initiation;
- upgrade of an MCVideo private call to an MCVideo emergency private; and
- cancellation of the MCVideo emergency private call priority.

Key aspects of MCVideo emergency private calls include:

- adjusted EPS bearer priority for both participants whether or not they are both in an emergency condition (i.e. both have their MCVideo emergency state set). This is achieved by using the Resource-Priority header field as specified in IETF RFC 4412 [33] with namespaces defined for use by MCVideo specified in IETF RFC 8101 [43];
- the initiator of the MCVideo emergency private call can override the other MCVideo user in the MCVideo emergency private call unless that user also has their MCVideo emergency state set;
- restoration of normal EPS bearer priority to the call according to system policy (e.g., configured time limit for the emergency priority of an MCVideo emergency private call or cancellation of the emergency condition of the private call);
- restoration of normal transmission control priority participants when the emergency elevated priority is cancelled;
- requires the MCVideo user to be authorised to either originate or cancel an MCVideo emergency private call;
- requires the targeted MCVideo user to be authorised to receive an MCVideo emergency private call;
- requests to originate MCVideo emergency private calls may also include an indication of an MCVideo emergency alert; and
- the originator of the MCVideo emergency private call can request that the call use either manual or automatic commencement mode.

There are a number of states that are key in managing these aspects of MCVideo emergency private calls, which include:

- **MCVideo emergency state (MVES):** as defined in 3GPP TS 22.281 [36] and 3GPP TS 23.281 [26], indicates that the MCVideo user is in a life-threatening situation. Managed by the MCVideo user of the device or an authorised MCVideo user. While the MCVideo emergency state is set on the client, all MCVideo group and private calls originated by the client will be MCVideo emergency calls, assuming the MCVideo user is authorised for MCVideo emergency calls on them.
- **MCVideo private emergency alert (MVPEA) state:** this is an internal state of the MCVideo client which in conjunction with the MCVideo emergency private call state aids in managing the MCVideo emergency state and related actions.
- **MCVideo emergency private call (MVEPC) state:** this is an internal state managed by the MCVideo client which in conjunction with the MCVideo emergency alert state aids in managing the MCVideo emergency state and related actions.
- **In-progress emergency private call (IPEPC) state:** indicates whether or not there is an MCVideo emergency private call in-progress for the two participants. This state is managed by the controlling MCVideo function. All private calls originated between these two participants when in an in-progress emergency private call state are MCVideo emergency private calls until this state is cancelled, whether or not the originator is in an MCVideo emergency state.
- **MCVideo emergency private priority (MVEPP) state:** this is an internal state managed by the MCVideo client which tracks the in-progress emergency private call state of the private call managed by the controlling MCVideo function. Ideally, the MCVideo client would not need to track the in-progress emergency private priority state, but doing so enables the MCVideo client to request MCVideo emergency-level priority earlier than otherwise possible. For example, if the MCVideo user wishes to join an MCVideo emergency private call and is not in the MCVideo emergency state, the MCVideo client should have emergency level priority. If it has knowledge of the in-progress emergency private priority state of the private call (i.e., the two participants), it can request priority by including a Resource-Priority header field set to the MCVideo namespace specified in draft-

holmberg-dispatch-mcptt-rp-namespace [48], and appropriate priority level in the SIP INVITE request (or SIP re-INVITE request).

NOTE: The above states and their transitions are described in Annex G.

4.6.3 MCVideo emergency alerts

MCVideo emergency alerts as defined by 3GPP TS 23.281 [26] are supported by the procedures in this specification. The following MCVideo emergency group call functionalities are specified in the present document:

- MCVideo emergency alert origination; and
- MCVideo emergency alert cancellation.

MCVideo emergency alerts are supported procedurally by two general mechanisms. One mechanism is embedded within the MCVideo emergency call (both emergency private call and emergency group call using both prearranged and chat session models) signalling procedures documented in clause 9 and clause 10 of this specification. The other mechanism utilizes SIP MESSAGE requests and is documented in clause 11.

MCVideo emergency alerts can be initiated or cancelled as options in the following signalling procedures documented in clause 9 and clause 10:

- MCVideo emergency group call initiation;
- MCVideo group call upgraded to MCVideo emergency call;
- MCVideo emergency group call cancellation (i.e., in-progress emergency state of the group set to false);
- MCVideo emergency private call initiation; and
- MCVideo private call upgrade to MCVideo emergency private call.

MCVideo emergency alerts can also be initiated or cancelled as described in the procedures of clause 11 which include:

- MCVideo emergency alert initiation; and
- MCVideo emergency alert cancellation (with optional cancelling of the in-progress emergency state of a group).

When MCVideo emergency alerts are initiated as an option in initiating or upgrading to an MCVideo emergency group call or are initiated using SIP MESSAGE requests, they are targeted to an MCVideo group, and, if not already affiliated, will result in the initiator being implicitly affiliated to the MCVideo group. When initiated as an option in initiating or upgrading to an MCVideo emergency private call, an MCVideo emergency alert is targeted to an individual MCVideo user, not to an MCVideo group.

Key aspects of MCVideo emergency alerts include:

- **MCVideo emergency (MVES) state:** the MCVideo client's MCVideo emergency state as described in clause G.1 is set upon initiation of an MCVideo emergency alert. While the MCVideo emergency state is set, assuming the MCVideo user has the needed authorisations, if the user initiates a private call and is authorised to do so, the MCVideo private call will be an MCVideo emergency private call. Similarly, assuming the needed authorisations, any subsequent MCVideo group call initiated by an MCVideo user with the MCVideo emergency state set will be an MCVideo emergency group call.
- **MCVideo emergency alert (MVEA) state:** the MCVideo client maintains the internal MCVideo emergency alert state (MEA) which aids in the management of the MCVideo emergency state as described in clause G.5.
- **MCVideo private emergency alert (MVPEA) state:** the MCVideo client maintains the MCVideo private emergency alert state of an MCVideo emergency alert targeted to an MCVideo user which aids in the management of the MCVideo emergency state.
- **In-progress emergency group (IPEG) state :** MCVideo emergency alert initiation or cancellation in and of itself does not impact the in-progress emergency state of the targeted group, which is maintained by the controlling MCVideo function, nor does it impact the priority of the EPS bearers. However, in setting the MCVideo emergency state, assuming an MCVideo user is authorised to make MCVideo emergency calls on the targeted group, any subsequent MCVideo group call the MCVideo user initiates on the group will cause the in-

progress emergency state of the group to be set as described in clause G.2 and will result in upgraded priority of the EPS bearers used in the MCVideo emergency call.

- **Authorisations for emergency alerts:** MCVideo users need to be authorised to initiate MCVideo emergency alerts and additionally need to be authorised to cancel MCVideo emergency alerts. The parameters related to these authorisations are specified in 3GPP TS 24.483 [4] and 3GPP TS 24.484 [25].

4.6.4 MCVideo imminent peril group call

MCVideo imminent peril group calls as defined by 3GPP TS 23.281 [26] are supported by the procedures in this specification. The following MCVideo imminent peril group calls functionalities are specified in the present document:

- MCVideo imminent peril group calls origination;
- upgrade of an MCVideo group call to an MCVideo imminent peril group call;
- upgrade from an MCVideo imminent peril group call to an MCVideo emergency group call; and
- cancellation of the in-progress imminent peril state of the group.

Key aspects of MCVideo imminent peril include:

- adjusted EPS bearer priority for all participants when the in-progress imminent peril state of the group is set whether or not they themselves initiated an imminent peril group call. For unicast bearers this is achieved by using the Resource-Priority header field as specified in IETF RFC 4412 [33] with namespaces defined for use by MCVideo specified in IETF RFC 8101 [43], and for MBMS bearers this is achieved by having the participating MCVideo function adjust the ARP (priority, PVI, PCI) and executing the Modify MBMS Bearer Procedure per 3GPP TS 29.468 [44];
- restoration of normal EPS bearer priority to the call when the in-progress imminent peril group state is cancelled; and
- requires the MCVideo user to be authorised to either originate or cancel an MCVideo imminent peril group call.

Relationship to other MCVideo priority group call types:

- A normal MCVideo group call can be upgraded to an MCVideo imminent peril group call;
- An MCVideo imminent peril group call can be upgraded to an MCVideo emergency group call;
- When either an MCVideo imminent peril group call or an MCVideo emergency group call (i.e., their respective "in-progress" states) the group call returns to the priority designated for normal group calls, i.e., there is no direct transition from an MCVideo emergency group call to an MCVideo imminent peril group call;
- MCVideo imminent peril functionality is only applicable to MCVideo group calls, not MCVideo private calls; and
- MCVideo imminent peril group calls have no associated alert capabilities such as the MCVideo emergency alert capability which is associated with MCVideo emergency group calls.

There are a number of states that are key in managing these aspects of MCVideo imminent peril group calls, which include:

- **MCVideo imminent peril group (MVIg) state:** this is an internal state of the MCVideo client which in conjunction with the MCVideo imminent peril group call state aids the client in managing the use of the Resource-Priority header field and related actions.
- **MCVideo imminent peril group call (MVIgC) state:** this is an internal state managed by the MCVideo client which in conjunction with the MCVideo imminent peril group state aids the client in managing the use of the Resource-Priority header field and related actions.
- **In-progress imminent peril group (IPIg) state:** this is a state of the MCVideo group which is managed by the controlling MCVideo function. While an MCVideo group is in an in-progress imminent peril group state, all participants in group calls using this group will receive elevated priority.

The above states and their transitions are described in Annex G.

4.7 End-to-end communication security

If a mission critical organisation requires MCVideo users to communicate using end-to-end security, a security context needs to be established between the initiator of the call and the recipient(s) of the call, prior to the establishment of media, or transmission control signalling. This provides assurance to MCVideo users that no unauthorised access to communications is taking place within the MCVideo network. An MCVideo key management server (KMS) manages the security domain. For any end-point to use or access end-to-end secure communications, it needs to be provisioned with keying material associated to its identity by the KMS as specified in 3GPP TS 33.180 [8].

For group calls, the security context is set up at the time of creation of the group. The group management server creates group call keying material associated with the group and distributes it to all members of the group, in advance of the initiation of a group call as specified in 3GPP TS 24.481 [24] and 3GPP TS 33.180 [8]. The establishment of a security context for group calls has no impact on this specification.

For private calls, the security context is initiated at call setup. An end-to-end security context is established that is unique to the pair of users involved in the call. The procedure involves transferral of an encapsulated private call key (PCK) and private call key id (PCK-ID) from the initiator to the terminator. The PCK is encrypted using the terminator's MCVideo ID and domain-specific material provided from the KMS. The PCK and PCK-ID are distributed within a MIKEY payload within the SDP offer of the private call request. This payload is called a MIKEY-SAKKE I_MESSAGE, as defined in IETF RFC 6509 [55], which ensures the confidentiality, integrity and authenticity of the payload. The encoding of the MIKEY payload in the SDP offer is described in IETF RFC 4567 [56] using an "a=keymgmt" attribute. The payload is signed using a key associated to the identity of the initiating user. At the terminating side, the signature is validated. If valid, the UE extracts and decrypts the encapsulated PCK. The MCVideo UE also extracts the PCK-ID. This process is described in 3GPP TS 33.180 [8]. With the PCK successfully shared between the two MCVideo UEs, the UEs are able to use SRTP/SRTCP to create an end-to-end secure session.

End-to-end security is independent of the transmission path and hence is applicable to both on and off-network communications. With a security context established, the group call key and private call key can be used to encrypt media and, if required, transmission control traffic between the end-points as described in 3GPP TS 24.581 [5].

4.8 Protection of sensitive application data.

In certain deployments, for example, in the case that the MCVideo operator uses the underlying SIP core infrastructure from the carrier operator, the MCVideo operator can prevent certain sensitive application data from being visible in the clear to the SIP layer. The following data are classed as sensitive application data:

- MCVideo ID;
- MCVideo group ID;
- user location information;
- emergency, alert and imminent-peril indicators;
- access token (containing the MCVideo ID); and
- MCVideo client ID.

The above data is transported as XML content in SIP messages. in XML elements or XML attributes.

Data is transported in attributes in the following circumstances in the procedures in the present document:

- an MCVideo ID, an MCVideo Group ID, and an MCVideo client ID in an XML document published in SIP PUBLISH request for affiliation according to IETF RFC 3856 [13];
- an MCVideo ID or an MCVideo Group ID in XML document notified in a SIP NOTIFY request for affiliation according to IETF RFC 3856 [13];
- an MCVideo ID in application/resource-lists+xml document included in an SIP INVITE request setting up a private call according to IETF RFC 5366 [37]; and

- an MCVideo ID in XML document provided in SIP NOTIFY request of a conference event package according to IETF RFC 4575 [57];

3GPP TS 33.180 [8] describes a method to provide confidentiality protection of sensitive application data in elements by using XML encryption (i.e. xmlenc) and in attributes by using an attribute confidentiality protection scheme described in subclause 6.6.2.3 of the present document. Integrity protection can also be provided by using XML signatures (i.e. xmlsig).

Protection of the data relies on a shared XML protection key (XPK) used to encrypt and sign data:

- between the MCVideo client and the MCVideo server, the XPK is a client-server key (CSK); and
- between MCVideo servers and between MCVideo domains, the XPK is a signalling protection key (SPK).

The CSK (XPK) and a key-id CSK-ID (XPK-ID) are generated from keying material provided by the key management server. Identity based public key encryption based on MIKEY-SAKKE is used to transport the CSK between SIP end-points. The encrypted CSK is transported from the MCVideo client to the MCVideo server when the MCVideo client performs service authorisation as described in clause 7 and is also used during service authorisation to protect the access token.

The SPK (XPK) and a key-id SPK-ID (XPK-ID) are directly provisioned in the MCVideo servers.

Configuration in the MCVideo client and MCVideo server is used to determine whether one or both of confidentiality protection and integrity protection are required.

4.9 MCVideo client ID

The MCVideo client assigns the MCVideo client ID when the MCVideo client is used for the first time. The MCVideo client generates the MCVideo client ID as specified in subclause 4.2 of IETF RFC 4122 [58].

The MCVideo client preserves the MCVideo client ID:

- while the MCVideo client is SIP registered as specified in 3GPP TS 24.229 [11];
- while the MCVideo client is not SIP registered as specified in 3GPP TS 24.229 [11] and the UE serving the MCVideo client is switched on;
- while the UE serving the MCVideo client is switched off; and
- while the UE serving the MCVideo client is power-cycled.

NOTE: MCVideo client ID is not preserved when the UE is reset to factory settings.

4.10 Off-network MCVideo

Off-network services are available for the user if the value of "/<x>/<x>/OffNetwork/Authorised" leaf node present in the MCVideo user profile as specified in 3GPP TS 24.483 [4] is set to "true".

5 Functional entities

5.1 General

Functional entities for MCVideo are described in 3GPP TS 23.281 [26], clause 6.2.

6 Common procedures

Editor's Note: simultaneous session for MCVideo calls and support for multiple devices could also be added in this section.

6.1 Introduction

This clause describes the common procedures for each functional entity as specified.

6.2 MCVideo client procedures

6.2.1 SDP offer generation

The SDP offer shall contain two SDP media-level sections for MCVideo speech according to 3GPP TS 24.229 [11] and, if transmission control shall be used during the session, shall contain one SDP media-level section for a media-transmission control entity according to 3GPP TS 24.581 [5].

When composing an SDP offer according to 3GPP TS 24.229 [11] the MCVideo client:

- 1) shall set the IP address of the MCVideo client for the offered MCVideo speech media stream and, if transmission control shall be used, for the offered media-transmission control entity;

NOTE: If the MCVideo client is behind a NAT the IP address and port included in the SDP offer can be a different IP address and port than the actual IP address and port of the MCVideo client depending on the NAT traversal method used by the SIP/IP Core.

- 2) shall include an "m=audio" media-level section for the MCVideo media stream consisting of:

- a) the port number for the media stream selected; and
- b) the codec(s) and media parameters and attributes with the following clarification:
 - i) if the MCVideo client is initiating a call to a group identity;
 - ii) if the <preferred-voice-encodings> element is present in the group document retrieved by the group management client as specified in 3GPP TS 24.481 [24] containing an <encoding> element with a "name" attribute; and
 - iii) if the MCVideo client supports the encoding name indicated in the value of the "name" attribute;then the MCVideo client:
 - i) shall insert the value of the "name" attribute in the <encoding name> field of the "a=rtpmap" attribute as defined in IETF RFC 4566 [2]; and
- c) "i=" field set to "audio component of MCVideo" according to 3GPP TS 24.229 [11];

- 3) shall include an "m=video" media-level section for the MCVideo media stream consisting of:

- a) the port number for the media stream selected; and
- b) the codec(s) and media parameters and attributes with the following clarification:
 - i) if the MCVideo client is initiating a call to a group identity;
 - ii) if the <preferred-video-encodings> element is present in the group document retrieved by the group management client as specified in 3GPP TS 24.481 [24] containing an <encoding> element with a "name" attribute; and
 - iii) if the MCVideo client supports the encoding name indicated in the value of the "name" attribute;then the MCVideo client:

- i) shall insert the value of the "name" attribute in the <encoding name> field of the "a=rtpmap" attribute as defined in IETF RFC 4566 [2]; and
 - c) "i=" field set to "video component of MCVideo" according to 3GPP TS 24.229 [11];
 - 4) if transmission control shall be used during the session, shall include an "m=application" media-level section; and
- Editor's Note: this media level m=line needs to be specified in 24.581, including port numbers, attributes, etc.**
- 5) if end-to-end security is required for a private call, shall include the MIKEY-SAKKE I_MESSAGE in an "a=key-mgmt" attribute as a "mikey" attribute value in the SDP offer as specified in IETF RFC 4567 [34].

6.2.2 SDP answer generation

When the MCVideo client receives an initial SDP offer for an MCVideo session, the MCVideo client shall process the SDP offer and shall compose an SDP answer according to 3GPP TS 24.229 [11].

When composing an SDP answer, the MCVideo client:

- 1) shall accept the MCVideo speech media stream in the SDP offer;
- 2) shall set the IP address of the MCVideo client for the accepted MCVideo speech media stream and, if included in the SDP offer, for the accepted media- transmission control entity;

NOTE: If the MCVideo client is behind a NAT the IP address and port included in the SDP answer can be a different IP address and port than the actual IP address and port of the MCVideo client depending on the NAT traversal method used by the SIP/IP Core.

- 3) shall include an "m=audio" media-level section for the accepted MCVideo speech media stream consisting of:
 - a) the port number for the media stream;
 - b) media-level attributes as specified in 3GPP TS 24.229 [4]; and
 - c) "i=" field set to "audio component of MCVideo" according to 3GPP TS 24.229 [11]; and
- 4) shall include an "m=video" media-level section for the accepted MCVideo speech media stream consisting of:
 - a) the port number for the media stream;
 - b) media-level attributes as specified in 3GPP TS 24.229 [11]; and
 - c) "i=" field set to "video component of MCVideo" according to 3GPP TS 24.229 [11]; and
- 5) if included in the SDP offer, shall include the media-level section of the offered media-transmission control.

Editor's Note: this media level m=line needs to be specified in 24.581, including port numbers, attributes, etc.

6.2.3 Commencement modes

6.2.3.1 Automatic commencement mode

6.2.3.1.1 Automatic commencement mode for private calls

When performing the automatic commencement mode procedures, the MCVideo 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 [11];
- 2) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;
- 3) shall include the g.3gpp.mcvideo 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.mcvideo" 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 [23]. 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 [11] with the clarifications given in subclause 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.

- 8) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideo-called-party-id> element set to the MCVideo ID of the called MCVideo user, in the SIP 200 (OK) response;
- 9) shall send the SIP 200 (OK) response towards the MCVideo server according to rules and procedures of 3GPP TS 24.229 [11];
- 10) 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
- 11) shall interact with the media plane as specified in 3GPP TS 24.581 [5].

When NAT traversal is supported by the MCVideo client and when the MCVideo client is behind a NAT, generation of SIP responses is done as specified in this subclause and as specified in IETF RFC 5626 [35].

6.2.3.1.2 Automatic commencement mode for group calls

When performing the automatic commencement mode procedures, the MCVideo client shall follow the procedures in subclause 6.2.3.1.1 with the following clarification:

- The MCVideo client may include a P-Answer-State header field with the value "Confirmed" as specified in IETF RFC 4964 [30] in the SIP 200 (OK) response.

6.2.3.2 Manual commencement mode

6.2.3.2.1 Manual commencement mode for private calls

When performing the manual commencement mode procedures:

- 1) if the MCVideo user declines the MCVideo session invitation the MCVideo client shall send a SIP 480 (Temporarily Unavailable) response towards the MCVideo server with the warning text set to: "110 user declined the call invitation" in a Warning header field as specified in subclause 4.4, and not continue with the rest of the steps in this subclause.

The MCVideo client:

- 1) shall accept the SIP INVITE request and generate a SIP 180 (Ringing) response according to rules and procedures of 3GPP TS 24.229 [11];
- 2) shall include the option tag "timer" in a Require header field of the SIP 180 (Ringing) response;
- 3) shall include the g.3gpp.mcvideo media feature tag in the Contact header field of the SIP 180 (Ringing) response;
- 4) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo" in the Contact header field of the SIP 180 (Ringing) response;

- 5) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideo-called-party-id> element set to the MCVideo ID of the called MCVideo user, in the SIP 180 (Ringing) response; and
- 6) shall send the SIP 180 (Ringing) response to the MCVideo server.

When sending the SIP 200 (OK) response to the incoming SIP INVITE request, the MCVideo client shall follow the procedures in subclause 6.2.3.1.1.

When NAT traversal is supported by the MCVideo client and when the MCVideo client is behind a NAT, generation of SIP responses is done as specified in this subclause and as specified in IETF RFC 5626 [35].

6.2.3.2.2 Manual commencement mode for group calls

When performing the manual commencement mode procedures:

- 1) the terminating MCVideo client may automatically generate a SIP 183 (Session Progress) in accordance with 3GPP TS 24.229 [11], prior to the MCVideo user's acknowledgement; and
- 2) if the MCVideo user declines the MCVideo session invitation the MCVideo client shall send a SIP 480 (Temporarily Unavailable) response towards the MCVideo server with the warning text set to: "110 user declined the call invitation" in a Warning header field as specified in subclause 4.4, and not continue with the rest of the steps in this subclause.

When generating a SIP 183 (Session Progress) response, the MCVideo client:

- 1) shall include the following in the Contact header field:
 - a) the g.3gpp.mcvideo media feature tag; and
 - b) the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo"; and
- 2) may include a P-Answer-State header field with the value "Unconfirmed" as specified in IETF RFC 4964 [30];

When sending the SIP 200 (OK) response to the incoming SIP INVITE request, the MCVideo client shall follow the procedures in subclause 6.2.3.1.2.

When NAT traversal is supported by the MCVideo client and when the MCVideo client is behind a NAT, generation of SIP responses is done as specified in this subclause and as specified in IETF RFC 5626 [35].

6.2.4 Leaving an MCVideo session initiated by MCVideo client

6.2.4.1 On-demand session case

Upon receiving a request from an MCVideo user to leave an MCVideo session established using on-demand session signalling, the MCVideo client:

- 1) shall interact with the media plane as specified in 3GPP TS 24.581 [5];
- 2) shall generate a SIP BYE request according to 3GPP TS 24.229 [11];
- 3) shall set the Request-URI to the MCVideo session identity to leave; and
- 4) shall send a SIP BYE request towards MCVideo server according to 3GPP TS 24.229 [11].

Upon receiving a SIP 200 (OK) response to the SIP BYE request, the MCVideo client shall interact with the media plane as specified in 3GPP TS 24.581 [5].

6.2.5 Releasing an MCVideo session initiated by MCVideo client

6.2.5.1 On-demand session case

When the MCVideo client wants to release an MCVideo session established using on-demand session signalling, the MCVideo client:

- 1) shall interact with the media plane as specified in 3GPP TS 24.581 [5];
- 2) shall generate a SIP BYE request according to 3GPP TS 24.229 [11];
- 3) shall set the Request-URI to the MCVideo session identity to release; and
- 4) shall send a SIP BYE request towards MCVideo server according to 3GPP TS 24.229 [11].

Upon receiving a SIP 200 (OK) response to the SIP BYE request, the MCVideo client shall interact with the media plane as specified in 3GPP TS 24.581 [5].

6.2.6 Receiving an MCVideo session release request

Upon receiving a SIP BYE request, the MCVideo client:

- 1) shall interact with the media plane as specified in 3GPP TS 24.581[5]; and
- 2) shall send SIP 200 (OK) response towards MCVideo server according to 3GPP TS 24.229 [11].

6.2.7 Receiving a SIP MESSAGE request

Upon receipt of a SIP MESSAGE request the MCVideo client shall handle the request in accordance with 3GPP TS 24.229 [11] and IETF RFC 3428 [17].

If the SIP MESSAGE request contains:

- an application/vnd.3gpp.mcvideo-info+xml MIME body; and
- a "text/plain" MIME body;

then the MCVideo client:

- 1) shall validate the MCVideo ID in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body; and
- 2) if the validation of the MCVideo ID succeeds, shall render the message content in the text/plain MIME body to the MCVideo user identified by the MCVideo ID.

6.2.8 Priority call conditions

This subclause contains common procedures to be used for MCVideo emergency group calls and MCVideo imminent peril group calls.

6.2.8.1 MCVideo emergency group call conditions

6.2.8.1.1 SIP INVITE request for originating MCVideo emergency group calls

This subclause is referenced from other procedures.

When the MCVideo emergency state is set and this MCVideo user and MCVideo group are authorised to initiate MCVideo emergency group calls as determined by the procedures of subclause 6.2.8.1.8, the MCVideo client:

- 1) shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body in the SIP INVITE request, an <emergency-ind> element set to "true" and if the MCVideo emergency group call state is set to "MVEGC 1: emergency-gc-capable", shall set the MCVideo emergency group call state to "MVEGC 2: emergency-call-requested";
- 2) if the MCVideo user has also requested an MCVideo emergency alert to be sent and this is an authorised request for MCVideo emergency alert as determined by the procedures of subclause 6.2.8.1.6, and the MCVideo emergency alert state is set to "MVEA 1: no-alert", shall:
 - a) set the <alert-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to "true" and set the MCVideo emergency alert state to "MVEA 2: emergency-alert-confirm-pending"; and

- b) perform the procedures specified in subclause 6.2.9.1 for the MCVideo emergency alert trigger;
- 3) if the MCVideo user has not requested an MCVideo emergency alert to be sent and the MCVideo emergency alert state is set to "MVEA 1: no-alert", shall set the <alert-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to "false"; and
- 4) if the MCVideo client emergency group state of the group is set to a value other than "MVEG 2: in-progress" set the MCVideo client emergency group state of the MCVideo group to "MVEG 3: confirm-pending".

NOTE 1: This is the case of an MCVideo user already being in the MCVideo emergency state it initiated previously while originating an MCVideo emergency group call or MCVideo emergency alert. All group calls the MCVideo user originates while in MCVideo emergency state will be MCVideo emergency group calls.

When the MCVideo emergency state is clear and the MCVideo emergency group call state is set to "MVEGC 1: emergency-gc-capable" and the received SIP request contains an authorised request for MCVideo emergency group call as determined by the procedures of subclause 6.2.8.1.8, the MCVideo client shall set the MCVideo emergency state and perform the following actions:

- 1) shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body in the SIP INVITE request an <emergency-ind> element set to "true" and set the MCVideo emergency group call state to "MVEGC 2: emergency-call-requested" state;
- 2) if the MCVideo user has also requested an MCVideo emergency alert to be sent and this is an authorised request for MCVideo emergency alert as determined by the procedures of subclause 6.2.8.1.6, shall:
 - a) include in the application/vnd.3gpp.mcvideo-info+xml MIME body the <alert-ind> element set to "true" and set the MCVideo emergency alert state to "MVEA 2: emergency-alert-confirm-pending"; and
 - b) perform the procedures specified in subclause 6.2.9.1 for the MCVideo emergency alert trigger;
- 3) if the MCVideo user has not requested an MCVideo emergency alert to be sent, shall set the <alert-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to "false"; and
- 4) if the MCVideo client emergency group state of the group is set to a value other than "MVEG 2: in-progress" shall set the MCVideo client emergency group state of the MCVideo group to "MVEG 3: confirm-pending".

NOTE 2: This is the case of an initial MCVideo emergency group call and optionally an MCVideo emergency alert being sent. As the MCVideo emergency state is not sent, there is no MCVideo emergency alert outstanding.

NOTE 3: An MCVideo group call originated by an affiliated member of an MCVideo group which is in an in-progress emergency state (as tracked on the MCVideo client by the MCVideo client emergency group state) but is not in an MCVideo emergency state of their own will also be an MCVideo emergency group call. The <emergency-ind> and <alert-ind> elements of the application/vnd.3gpp.mcvideo-info+xml MIME body do not need to be included in this case and hence no action needs to be taken in this subclause.

6.2.8.1.2 Resource-Priority header field for MCVideo emergency group calls

This subclause is referenced from other procedures.

If the MCVideo emergency group call state is set to either "MVEGC 2: emergency-call-requested" or "MVEGC 3: emergency-call-granted" and this is an authorised request for an MCVideo emergency group call as determined by the procedures of subclause 6.2.8.1.8, or the MCVideo client emergency group state of the group is set to "MVEG 2: in-progress", the MCVideo client shall include in the SIP INVITE request a Resource-Priority header field populated with the values for an MCVideo emergency group call as specified in subclause 6.2.8.1.15.

NOTE: The MCVideo client ideally would not need to maintain knowledge of the in-progress emergency state of the group (as tracked on the MCVideo client by the MCVideo client emergency group state) but can use this knowledge to provide a Resource-Priority header field set to emergency level priority, which starts the infrastructure priority adjustment process sooner than otherwise would be the case.

If this is an authorised request to cancel the MCVideo emergency group call as determined by the procedures of subclause 6.2.8.1.7, and the MCVideo client emergency group state of the group is "no-emergency" or "cancel-

pending", the MCVideo client shall include in the SIP INVITE request a Resource-Priority header field populated with the values for a normal MCVideo group call as specified in subclause 6.2.8.1.15.

6.2.8.1.3 SIP re-INVITE request for cancelling MCVideo in-progress emergency group state

This subclause is referenced from other procedures.

If the MCVideo emergency group call state is set to "MVEGC 3: emergency-call-granted" and the MCVideo emergency alert state is set to "MVEA 1: no-alert", the MCVideo client shall generate a SIP re-INVITE request according to 3GPP TS 24.229 [11] with the clarifications given below.

NOTE 1: This procedure assumes that the calling procedure has verified that the MCVideo user has made an authorised request for cancelling MCVideo in-progress emergency group state of the group.

The MCVideo client:

- 1) shall include in the SIP re-INVITE request an application/vnd.3gpp.mcvideo-info+xml MIME body as defined in clause F.1 with the <emergency-ind> element set to "false";
- 2) shall clear the MCVideo emergency state; and
- 3) shall set MCVideo emergency group state of the MCVideo group to "MVEG 3: cancel-pending"

NOTE 2: This is the case of an MCVideo user who has initiated an MCVideo emergency group call and wants to cancel it.

If the MCVideo emergency group call state is set to "MVEGC 3: emergency-call-granted" and the MCVideo emergency alert state is set to a value other than "MVEA 1: no-alert" and the MCVideo user has indicated only the MCVideo emergency group call should be cancelled, the MCVideo client:

- 1) shall include in the SIP re-INVITE request an application/vnd.3gpp.mcvideo-info+xml MIME body as defined in clause F.1 with the <emergency-ind> element set to "false"; and
- 2) shall set the MCVideo emergency group state of the MCVideo group to "MVEG 3: cancel-pending".

NOTE 3: This is the case of an MCVideo user has initiated both an MCVideo emergency group call and an MCVideo emergency alert and wishes to only cancel the MCVideo emergency group call. This leaves the MCVideo emergency state set.

If the MCVideo emergency group call state is set to "MVEGC 3: emergency-call-granted" and the MCVideo emergency alert state is set to a value other than "MVEA 1: no-alert" and the MCVideo user has indicated that the MCVideo emergency alert on the MCVideo group should be cancelled in addition to the MCVideo emergency group call, the MCVideo client:

- 1) shall include in the SIP re-INVITE request an application/vnd.3gpp.mcvideo-info+xml MIME body as defined in clause F.1 with the <emergency-ind> element set to "false";
- 2) shall if this is an authorised request to cancel an MCVideo emergency alert as determined by the procedures of subclause 6.2.8.1.6:
 - a) include in the application/vnd.3gpp.mcvideo-info+xml MIME body an <alert-ind> element set to "false";
 - b) set the MCVideo emergency alert state to "MVEA 4: Emergency-alert-cancel-pending"; and
 - c) clear the MCVideo emergency state;
- 3) should, if this is not an authorised request to cancel an MCVideo emergency alert as determined by the procedures of subclause 6.2.8.1.6, indicate to the MCVideo user that they are not authorised to cancel the MCVideo emergency alert; and
- 4) shall set the MCVideo emergency group state of the MCVideo group to "MVEG 3: cancel-pending".

NOTE 4: This is the case of an MCVideo user that has initiated both an MCVideo emergency group call and an MCVideo emergency alert and wishes to cancel both.

6.2.8.1.4 Receiving a SIP 2xx response to a SIP request for a priority call

In the procedures in this subclause, a priority group call refers to an MCVideo emergency group call or an MCVideo imminent peril group call.

On receiving a SIP 2xx response to a SIP request for a priority group call, the MCVideo client:

- 1) if the MCVideo emergency group call state is set to "MVEGC 2: emergency-call-requested" or "MVEGC 3: emergency-call-granted":
 - a) shall set the MCVideo client emergency group state of the group to "MVEG 2: in-progress" if it was not already set;
 - b) if the MCVideo emergency alert state is set to "MVEA 2: emergency-alert-confirm-pending" and the SIP 2xx response to the SIP request for a priority group call does not contain a Warning header field as specified in subclause 4.4 with the warning text containing the mcvideo-warn-code set to "149", shall set the MCVideo emergency alert state to "MVEA 3: emergency-alert-initiated";
 - c) shall set the MCVideo emergency group call state to "MVEGC 3: emergency-call-granted"; and
 - d) shall set the MCVideo imminent peril group call state to "MVIGC 1: imminent-peril-capable" and the MCVideo imminent peril group state to "MVIG 1: no-imminent-peril"; or
- 2) if the MCVideo imminent peril group call state is set to "MVIGC 2: imminent-peril-call-requested" or "MVIGC 3: imminent-peril-call-granted" and the SIP 2xx response to the SIP request for an imminent peril group call does not contain a Warning header field as specified in subclause 4.4 with the warning text containing the mcvideo-warn-code set to "149":
 - a) set the MCVideo imminent peril group call state to "MVIGC 3: imminent-peril-call-granted"; and
 - b) set the MCVideo imminent peril group state to "MVIG 2: in-progress".

6.2.8.1.5 Receiving a SIP 4xx response, SIP 5xx response or SIP 6xx response to a SIP request for a priority group call

In the procedures in this subclause, a priority group call refers to an MCVideo emergency group call or an MCVideo imminent peril group call.

Upon receiving a SIP 4xx response, SIP 5xx response or a SIP 6xx response to a SIP request for a priority group call the MCVideo client:

- 1) if the MCVideo emergency group call state is set to "MVEGC 2: emergency-call-requested" or "MVEGC 3: emergency-call-granted":
 - a) shall set the MCVideo emergency group call state to "MVEGC 1: emergency-gc-capable";
 - b) if the MCVideo client emergency group state of the group is "MVEG 3: confirm-pending" shall set the MCVideo client emergency group state of the group to "MVEG 1: no-emergency"; and
 - c) if the sent SIP request for a priority group call contained an application/vnd.3gpp.mcvideo-info+xml MIME body with an <alert-ind> element set to a value of "true", shall set the MCVideo emergency alert state to "MVEA 1: "no-alert"; and
- 2) if the MCVideo imminent peril group call state is set to "MVIGC 2: imminent-peril-call-requested" or "MVIGC 3: imminent-peril-call-granted":
 - a) shall set the MCVideo imminent peril group state to "MVIG 1: no-imminent-peril"; and
 - b) shall set the MCVideo imminent peril group call state to "MVIGC 1: imminent-peril-capable".

6.2.8.1.6 Determining authorisation for initiating or cancelling an MCVideo emergency alert

If the MCVideo client receives a request from the MCVideo user to send an MCVideo emergency alert and:

- 1) if the <allow-activate-emergency-alert> element of the <ruleset> element of the MCVideo user profile document identified by the MCVideo ID of the calling MCVideo user is set to a value of "true"; and

Editor's Note: the user profile document needs to be added to 24.484.

- 2) if the "entry-info" attribute of the <entry> element of the <EmergencyAlert> element contained within the <MCVideo-group-call> element of the MCVideo user profile document is set to a value of:
 - a) "DedicatedGroup", and if the <uri-entry> element of the <entry> element of the <EmergencyAlert> element of the <MCVideo-group-call> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) contains the MCVideo group identity of the MCVideo group targeted by the calling MCVideo user; or
 - b) "UseCurrentlySelectedGroup" and the <allow-MCVideo-emergency-alert> element of the <list-element> of the group document identified by the MCVideo group identity targeted for the emergency alert is set to a value of "true" as specified in 3GPP TS 24.481 [24];

then the MCVideo emergency alert request shall be considered to be an authorised request for an MCVideo emergency alert. In all other cases, it shall be considered to be an unauthorised request for an MCVideo emergency alert.

If the MCVideo client receives a request from the MCVideo user to cancel an MCVideo emergency alert to an MCVideo group, and if the <allow-cancel-emergency-alert> element of the <ruleset> element of the MCVideo user profile document identified by the MCVideo ID of the calling MCVideo user (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "true", then the MCVideo emergency alert cancellation request shall be considered to be an authorised request to cancel an MCVideo emergency alert. In all other cases, it shall be considered to be an unauthorised request to cancel an MCVideo emergency alert.

6.2.8.1.7 Determining authorisation for cancelling the in-progress emergency state of an MCVideo group

When the MCVideo client receives a request from the MCVideo user to cancel the in-progress emergency state of a group the MCVideo client and:

- 1) if the <allow-cancel-group-emergency> element of the <ruleset> element of the MCVideo user profile document identified by the MCVideo ID of the calling MCVideo user (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "true", then the in-progress emergency group state cancel request shall be considered to be an authorised request for in-progress emergency group state cancellation; or
- 2) if the <allow-cancel-group-emergency> element of the <ruleset> element of the MCVideo user profile document identified by the MCVideo ID of the calling MCVideo user (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "false", then the in-progress emergency group state cancel request shall be considered to be an unauthorised request for in-progress emergency group state cancellation.

6.2.8.1.8 Determining authorisation for originating a priority group call

When the MCVideo client receives a request from the MCVideo user to originate an MCVideo emergency group call the MCVideo client shall check the following:

- 1) if the <allow-emergency-group-call> element of the <ruleset> element of the MCVideo user profile document identified by the MCVideo ID of the calling user (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "true" and
 - a) if the "entry-info" attribute of the <entry> element of the <MCVideoGroupInitiation> element of the <EmergencyCall> element contained within the <MCVideo-group-call> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "DedicatedGroup" and if the <uri-entry> element of the <entry> element of the <MCVideoGroupInitiation> element contains the identity of the MCVideo group targeted by the calling MCVideo user; or
 - b) if the "entry-info" attribute of the <entry> element of the <MCVideoGroupInitiation> element of the <EmergencyCall> contained within the <MCVideo-group-call> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "UseCurrentlySelectedGroup";

then the MCVideo emergency group call request shall be considered to be an authorised request for an MCVideo emergency group call;

In all other cases, the request to originate an MCVideo emergency group call shall be considered to be an unauthorised request to originate an MCVideo emergency group call.

When the MCVideo client receives a request from the MCVideo user to originate an MCVideo imminent peril group call the MCVideo client shall check the following:

- 1 if the <allow-imminent-peril-call> element of <ruleset> element of the MCVideo user profile document identified by the MCVideo ID of the calling user (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "true" and:
 - a) if the "entry-info" attribute of the <entry> element of the <MCVideoGroupInitiation> element contained within the <ImminentPerilCall> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "DedicatedGroup" and if the <MCVideoGroupInitiation> element contains the identity of the MCVideo group targeted by the calling MCVideo user; or
 - b) if the "entry-info" attribute of the <entry> element of the <MCVideoGroupInitiation> element contained within the <ImminentPerilCall> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "UseCurrentlySelectedGroup";

then the MCVideo imminent peril group call request shall be considered to be an authorised request for an MCVideo imminent peril group call;

In all other cases, the request to originate an MCVideo imminent peril group call shall be considered to be an unauthorised request to originate an MCVideo imminent peril group call.

6.2.8.1.9 SIP request for originating MCVideo imminent peril group calls

This subclause is referenced from other procedures.

When the MCVideo client receives a request from the MCVideo user to originate an MCVideo imminent peril group call, and this is an authorised request for an MCVideo imminent peril group call as determined by the procedures of subclause 6.2.8.1.8, the MCVideo client:

- 1) if the MCVideo client imminent peril group state is set to "MVIC 1: imminent-peril-capable" and the in-progress emergency state of the group is set to a value of "false":
 - a) shall include in the SIP request a MIME mcvideoinfo body as defined in Annex F.1 with the <imminentperil-ind> element set to "true" and set the MCVideo emergency group call state to "MVIC 2: imminent-peril-call-requested" state; and
 - b) if the MCVideo client imminent peril group state of the group is set to a value other than "MVIC 2: in-progress" shall set the MCVideo client emergency group state of the MCVideo group to "MVIC 3: confirm-pending".

NOTE: An MCVideo group call originated by an affiliated member of an MCVideo group which is in an in-progress imminent peril state (as tracked on the MCVideo client by the MCVideo client imminent peril group state) will also have the priority associated with MCVideo imminent peril group calls. The <imminentperil-ind> element of the MIME mcvideoinfo body does not need to be included in this case, nor do any state changes result and hence no action needs to be taken in this subclause.

6.2.8.1.10 Determining authorisation for cancelling an imminent peril group call

When the MCVideo client receives a request from the MCVideo user to cancel an MCVideo imminent peril group call the MCVideo client shall:

- 1) if the <allow-cancel-imminent-peril> element of the <ruleset> element of the MCVideo user profile document identified by the MCVideo ID of the calling user (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "true" the MCVideo imminent peril call cancellation request shall be considered to be an authorised request to cancel the MCVideo imminent peril group call; or

- 2) if the <allow-cancel-imminent-peril> element of the <ruleset> element of the MCVideo user profile document identified by the MCVideo ID of the calling user (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "false" the MCVideo imminent peril call cancellation request shall be considered to be an unauthorised request to cancel the MCVideo imminent peril group call.

6.2.8.1.11 SIP re-INVITE request for cancelling MCVideo in-progress imminent peril group state

This subclause is referenced from other procedures.

If the MCVideo imminent peril group call state is set to "MVIGC 3: imminent-peril-call-granted" or the MCVideo imminent peril group state of the MCVideo group is set to "MVIG 2: in-progress", the MCVideo client shall generate a SIP re-INVITE request according to 3GPP TS 24.229 [11] with the clarifications given below.

- NOTE 1: This procedure assumes that the calling procedure has verified that the MCVideo user has made an authorised request for cancelling the in-progress imminent peril group state of the group.

The MCVideo client:

- 1) shall include in the SIP re-INVITE request an application/vnd.3gpp.mcvideo-info+xml MIME body as defined in clause F.1 with the <imminentperil-ind> element set to "false"; and
- 2) shall set MCVideo imminent peril group state of the MCVideo group to "MVIG 4: cancel-pending".

- NOTE 2: This is the case of an MCVideo user who has initiated an MCVideo imminent peril group call and wants to cancel it, or another authorised member of the group who wishes to cancel the in-progress imminent peril state of the group.

6.2.8.1.12 Resource-Priority header field for MCVideo imminent peril group calls

This subclause is referenced from other procedures.

When the MCVideo imminent peril group call state is set "MVIGC 2: imminent-peril-call-requested" or "MVIGC 3: imminent-peril-call-granted" and this MCVideo user and group is authorised to originate MCVideo imminent peril group calls as determined by the procedures of subclause 6.2.8.1.8, or the MCVideo client imminent peril state of the group is set to "MVIG 2: in-progress", the MCVideo client:

- 1) shall include in the SIP INVITE request a Resource-Priority header field populated with the values for an MCVideo imminent peril group call as specified in subclause 6.2.8.1.15.

- NOTE: The MCVideo client ideally would not need to maintain knowledge of the in-progress imminent peril state of the group (as tracked on the MCVideo client by the MCVideo client imminent peril group state) but can use this knowledge to provide a Resource-Priority header field set to imminent peril level priority, which starts the infrastructure priority adjustment process sooner than otherwise would be the case.

When the MCVideo imminent peril group call state is set to "MVIGC 1: imminent-peril-gc-capable" and the MCVideo user is authorised to cancel MCVideo imminent peril group calls as determined by the procedures of subclause 6.2.8.1.10, or the MCVideo client imminent peril group state of the group is "MVIG 1: no-imminent-peril" or "MVIG 4: cancel-pending", the MCVideo client:

- 1) shall include in the SIP INVITE request a Resource-Priority header field populated with the values for a normal MCVideo group call as specified in subclause 6.2.8.1.15.

6.2.8.1.13 Receiving a SIP INFO request in the dialog of a SIP request for a priority group call

This subclause is referenced from other procedures.

Upon receiving a SIP INFO request within the dialog of the SIP request for a priority group call:

- with the Info-Package header field containing the g.3gpp.mcvideo-info package name;
- with the application/vnd.3gpp.mcvideo-info+xml MIME body associated with the info package according to IETF RFC 6086 [54]; and

- with one or more of the <alert-ind>, <imminentperil> ind and <emergency-ind> elements set in the application/vnd.3gpp.mcvideo-info+xml MIME body;

the MCVideo client:

- 1) if the MCVideo emergency group call state is set to "MVEGC 3: emergency-call-granted":
 - a) if the MCVideo emergency alert state is set to "MVEA 2: emergency-alert-confirm-pending":
 - i) if the <alert-ind> element is set to a value of "false", shall set the MCVideo emergency alert state to "MVEA 1: no-alert"; and
 - ii) if the <alert-ind> element is set to a value of "true", shall set the MCVideo emergency alert state to "MVEA 3: emergency-alert-initiated";
- 2) if the MCVideo imminent peril group call state is set to "MVIGC 2: imminent-peril-call-requested" or "MVIGC 3: imminent-peril-call-granted":
 - a) if the <imminentperil-ind> element is set to a value of "false" and an <emergency-ind> element is set to a value of "true", shall:
 - i) set the MCVideo imminent peril group state to "MVIG 1: no-imminent-peril";
 - ii) set the MCVideo imminent peril group call state to "MVIGC 1: imminent-peril-capable"; and
 - iii) set the MCVideo client emergency group state of the group to "MVEG 2: in-progress"; and

NOTE 1: This is the case of an MCVideo client attempting to make an imminent peril group call when the group is in an in-progress emergency group state. The MCVideo client will then receive a notification that the imminent peril call request was denied, however they will be participating at the emergency level priority of the group. This could occur for example when an MCVideo client requests an imminent peril call to a group that they are not currently affiliated with.

NOTE 2: the MCVideo client emergency group state above is the MCVideo client's view of the in-progress emergency state of the group.

- 3) if the SIP request for a priority group call sent by the MCVideo client did not contain an <originated-by> element and if the MCVideo emergency alert state is set to "MVEA 4: Emergency-alert-cancel-pending":
 - a) if the <alert-ind> element contained in the SIP INFO request is set to a value of "true", shall set the MCVideo emergency alert state to "MVEA 3: emergency-alert-initiated"; and
 - b) if the <alert-ind> element contained in the SIP INFO request is set to a value of "false", shall set the MCVideo emergency alert state to "MVEA 1: no-alert".

6.2.8.1.14 SIP re-INVITE request for cancelling the in-progress emergency group state of a group by a third-party

This subclause is referenced from other procedures.

Upon receiving an authorised request to cancel an in-progress emergency group state of a group as determined by the procedures of subclause 6.2.8.1.7 from an MCVideo user, the MCVideo client shall generate a SIP re-INVITE request according to 3GPP TS 24.229 [11] with the clarifications given below.

The MCVideo client:

- 1) shall include in the SIP re-INVITE request an application/vnd.3gpp.mcvideo-info+xml MIME body as defined in clause F.1 with the <emergency-ind> element set to "false";
- 2) shall set MCVideo emergency group state of the MCVideo group to "MVEG 3: cancel-pending"; and
- 3) if the MCVideo user has indicated that an MCVideo emergency alert on the MCVideo group originated by another MCVideo user should be cancelled and this is an authorised request for an MCVideo emergency alert cancellation as determined by the procedures of subclause 6.2.8.1.6:

- a) shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body an <alert-ind> element set a value of "false"; and
- b) shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body an <originated-by> element set to the MCVideo ID of the MCVideo user who originated the MCVideo emergency alert.

NOTE: When an MCVideo emergency alert is cancelled by a MCVideo user other than its originator, the <originated-by> element is needed to identify which MCVideo emergency alert is being cancelled, as more than one MCVideo user could have originated emergency alerts to the same group.

6.2.8.1.15 Retrieving Resource-Priority header field values

This subclause is referenced from other procedures.

When determining the Resource-Priority header field namespace and priority values as specified in IETF RFC 8101 [38] for an MCVideo emergency group call or MCVideo emergency private call the MCVideo client:

- 1) shall retrieve the value of the <resource-priority-namespace> element contained in the <emergency-resource-priority> element contained in the <OnNetwork> element of the MCVideo service configuration document ; and
- 2) shall retrieve the value of the <resource-priority-priority> element contained in the <emergency-resource-priority> element contained in the <OnNetwork> element of the MCVideo service configuration document .

When determining the Resource-Priority header field namespace and priority values as specified in IETF RFC 8101 [38] for an MCVideo imminent peril group call the MCVideo client:

- 1) shall retrieve the value of the <resource-priority-namespace> element contained in the <imminent-peril-resource-priority> element contained in the <OnNetwork> element of the MCVideo service configuration document; and
- 2) shall retrieve the value of the <resource-priority-priority> element contained in the <imminent-peril-resource-priority> element contained in the <OnNetwork> element of the MCVideo service configuration document.

When determining the Resource-Priority header field namespace and priority values as specified in IETF RFC 8101 [38] for a normal MCVideo group or private call the MCVideo client:

- 1) shall retrieve the value of the <resource-priority-namespace> element contained in the <normal-resource-priority> element contained in the <OnNetwork> element of the MCVideo service configuration document ; and
- 2) shall retrieve the value of the <resource-priority-priority> element contained in the <normal-resource-priority> element contained in the <OnNetwork> element of the MCVideo service configuration document .

NOTE: The "normal" Resource-Priority header field value is needed to return to a normal priority value from a priority value adjusted for an MCVideo emergency group or private call or an MCVideo imminent peril group call. The "normal" priority received from the EPS by use of the "normal" Resource-Priority header field value is expected to be the same as the "normal" priority received from the EPS when initiating a call with no Resource-Priority header field included.

6.2.8.1.16 Resource-priority header field namespaces for MCVideo

The Resource-Priority header field is specified as per IETF RFC 4412 [33]. The Resource-Priority namespace for MCVideo emergency group call, MCVideo emergency private call, MCVideo imminent peril group call, normal MCVideo group or private call, shall reuse the namespace for Mission Critical Push-to-Talk, which is specified in IETF RFC 8101 [38].

6.2.8.1.17 Priority group call conditions upon receiving call release

This subclause is referenced from other procedures.

Upon receiving a request to release the MCVideo emergency group call or an MCVideo imminent peril group call in an MCVideo group session is in-progress or is in the process of being established:

- 1) if the MCVideo emergency group call state is set to "MVEGC 2: emergency-call-requested":

- a) shall set the MCVideo emergency group call state to "MVEGC 1: emergency-gc-capable";
 - b) if the MCVideo client emergency group state of the group is "MVEG 3: confirm-pending" shall set the MCVideo client emergency group state of the group to "MVEG 1: no-emergency"; and
 - c) if the MCVideo emergency alert state is set to "MVEA 2: emergency-alert-confirm-pending" shall set the MCVideo emergency alert state to "MVEA 1: no-alert"; and
- 2) if the MCVideo imminent peril group call state is set to "MVIC 2: imminent-peril-call-requested":
- a) if the MCVideo imminent peril group call state of the group is "MVIC 3: confirm-pending", shall set the MCVideo imminent peril group state to "MVIC 1: no-imminent-peril"; and
- b) shall set the MCVideo imminent peril group call state to "MVIC 1: imminent-peril-capable".

NOTE: This subclause is referenced from other procedures.

When the MCVideo user initiates a broadcast group call, the MCVideo client:

- 1) in the case of the prearranged group call is initiated on-demand, shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body the <broadcast-ind> element set to "true" as defined in clause F.1; and
- 2) in the case the prearranged group call is initiated using a pre-established session, shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body in the "body" URI header field in the Refer-To header field the <broadcast-ind> element set to "true" as defined in clause F.1.

6.2.9 Location information

6.2.9.1 Location information for location reporting

This procedure is initiated by the MCVideo client when it is including location report information as part of a SIP request for a specified location trigger.

The MCVideo client:

- 1) shall include an application/vnd.3gpp.location-info+xml MIME body as specified in Annex F.3 with a <Report> element included in the <location-info> root element; and
- 2) shall include in the <Report> element the specific location information configured for the specified location trigger.

6.3.1 Distinction of requests sent to the MCVideo server

6.3.1.1 SIP INVITE request

The MCVideo server needs to distinguish between the following initial SIP INVITE requests for originations and terminations:

- SIP INVITE requests routed to the participating MCVideo function as a result of processing initial filter criteria at the S-CSCF in accordance with the origination procedures as specified in 3GPP TS 24.229 [11] and the Request-URI is set to a public service identity of the participating MCVideo function that does not identify the pre-established session set-up. Such requests are known as "SIP INVITE request for originating participating MCVideo function" in the procedures in the present document;
- SIP INVITE requests routed to the participating MCVideo function as a result of processing initial filter criteria at the S-CSCF in accordance with the termination procedures as specified in 3GPP TS 24.229 [11] and the Request-URI contains a PSI of the terminating participating MCVideo function. Such requests are known as "SIP INVITE request for terminating participating MCVideo function" in the procedures in the present document;

- SIP INVITE requests routed to the controlling MCVideo function as a result of PSI routing on the originating side in accordance with the originating procedures as specified in 3GPP TS 24.229 [11], or as a result of direct PSI routing, in accordance with the termination procedures as specified in 3GPP TS 24.229 [11], the Request-URI is set to a public service identity for MCVideo private call and the Contact header field does not contain the isfocus media feature tag specified in IETF RFC 3840 [16]. Such requests are known as "SIP INVITE request for controlling MCVideo function of a private call" in the procedures in the present document; and
- SIP INVITE requests routed to the controlling MCVideo function as a result of PSI routing on the originating side in accordance with the originating procedures as specified in 3GPP TS 24.229 [11], or as a result of direct PSI routing, in accordance with the termination procedures as specified in 3GPP TS 24.229 [11], the Request-URI is set to a public service identity serving an MCVideo group and the Contact header field does not contain the isfocus media feature tag specified in IETF RFC 3840 [16]. Such requests are known as "SIP INVITE request for controlling MCVideo function of an MCVideo group" in the procedures in the present document.

6.3.1.2 SIP MESSAGE request

The MCVideo server needs to distinguish between the following SIP MESSAGE request for originations and terminations:

- SIP MESSAGE requests routed to the participating MCVideo function as a result of processing initial filter criteria at the S-CSCF in accordance with the origination procedures as specified in 3GPP TS 24.229 [11] with the Request-URI set to the MBMS public service identity of the participating MCVideo function. Such requests are known as "SIP MESSAGE request for an MBMS listening status update" in the procedures in the present document;
- SIP MESSAGE request routed to the participating MCVideo function as a result of initial filter criteria containing a Content-Type header field set to "application/vnd.3gpp.mcvideo-location-info+xml" and includes an XML body containing a Location root element containing a Report element. Such requests are known as "SIP MESSAGE request for location reporting" in the present document;
- SIP MESSAGE requests routed to the originating participating MCVideo function as a result of initial filter criteria with the Request-URI set to the public service identity of the participating MCVideo function and containing a Content-Type header field set to "application/vnd.3gpp.mcvideo-info+xml" and includes an XML body containing a <mcvideoinfo> root element containing a <mcvideo-Params> element containing an <emergency-ind> element or an <alert-ind> element. Such requests are known as "SIP MESSAGE requests for emergency notification for originating participating MCVideo function" in the procedures in the present document;
- SIP MESSAGE requests routed to the terminating participating MCVideo function as a result of initial filter criteria with the Request-URI set to the public service identity of the terminating participating MCVideo function and containing a Content-Type header field set to "application/vnd.3gpp.mcvideo-info+xml" and includes an XML body containing a <mcvideoinfo> root element containing a <mcvideo-Params> element containing an <emergency-ind> element or an <alert-ind> element. Such requests are known as "SIP MESSAGE requests for emergency notification for terminating participating MCVideo function" in the procedures in the present document;
- SIP MESSAGE requests routed to the controlling MCVideo function as a result of initial filter criteria with the Request-URI set to the public service identity of the controlling MCVideo function and containing a Content-Type header field set to "application/vnd.3gpp.mcvideo-info+xml" and includes an XML body containing a <mcvideoinfo> root element containing a <mcvideo-Params> element containing an <emergency-ind> element or an <alert-ind> element. Such requests are known as "SIP MESSAGE requests for emergency notification for controlling MCVideo function" in the procedures in the present document;
- SIP MESSAGE request routed to the MCVideo client as a result of initial filter criteria containing a Content-Type header field set to "application/vnd.3gpp.mcvideo-location-info+xml" and includes an XML body containing a Location root element containing a Configuration element. Such requests are known as "SIP MESSAGE request for location report configuration" in the present document; and
- SIP MESSAGE request routed to the MCVideo client as a result of initial filter criteria containing a Content-Type header field set to "application/vnd.3gpp.mcvideo-location-info+xml" and includes an XML body containing a Location root element containing a Request element. Such requests are known as "SIP MESSAGE request for location report request" in the present document.

6.3.1.3 SIP SUBSCRIBE request

The MCVideo server needs to distinguish between the following SIP SUBSCRIBE request for originations and terminations:

- SIP SUBSCRIBE requests routed to the participating MCVideo function with the Request-URI set to the MCVideo session identity identifying the participating MCVideo function and the Event header field set to "conference". Such requests are known as "SIP SUBSCRIBE request for conference event status subscription" in the procedures in the present document;
- SIP SUBSCRIBE requests routed to the controlling MCVideo function with the Request-URI set to the MCVideo session identity identifying the controlling MCVideo function and containing an Event header field set to "conference". Such requests are known as "SIP SUBSCRIBE request for event status subscription in the controlling MCVideo function" in the procedures in the present document; and
- SIP SUBSCRIBE requests routed to the non-controlling MCVideo function with the Request-URI set to the MCVideo session identity identifying the non-controlling MCVideo function and containing an Event header field set to "conference". Such requests are known as "SIP SUBSCRIBE request for event status subscription in the non-controlling MCVideo function" in the procedures in the present document.

6.3.2 Participating MCVideo Function

6.3.2.1 Requests initiated by the served MCVideo user

6.3.2.1.1 SDP offer generation

6.3.2.1.1.1 On-demand session

This subclause is referenced from other subclauses.

The SDP offer is generated based on the received SDP offer. The SDP offer generated by the participating MCVideo function:

- 1) shall contain two SDP media-level sections for MCVideo speech as contained in the received SDP offer; and
- 2) shall contain an SDP media-level section for one media-transmission control entity, if present in the received SDP offer.

When composing the SDP offer according to 3GPP TS 24.229 [11], the participating MCVideo function:

- 1) shall replace the IP address and port number for the offered media stream in the received SDP offer with the IP address and port number of the participating MCVideo function, if required;

NOTE 1: Requirements can exist for the participating MCVideo function to be always included in the path of the offered media stream, for example: for the support of features such as MBMS, lawful interception and recording. Other examples can exist.

- 2) shall replace the IP address and port number for the offered media transmission control entity, if any, in the received SDP offer with the IP address and port number of the participating MCVideo function; and

NOTE 2: If the participating MCVideo function and the controlling MCVideo function are in the same MCVideo server, and the participating MCVideo function does not have a dedicated IP address or a dedicated port number for media transmission control or media stream, the replacement of the IP address or the port number is omitted.

- 3) shall contain an "a=key-mgmt" attribute field with a "mikey" attribute value, if present in the received SDP offer.

6.3.2.1.2 SDP answer generation

6.3.2.1.2.1 On-demand session

When composing the SDP answer according to 3GPP TS 24.229 [11], the participating MCVideo function:

- 1) shall replace the IP address and port number in the received SDP answer with the IP address and port number of the participating MCVideo function, for the accepted media stream in the received SDP offer, if required; and

NOTE 1: Requirements can exist for the participating MCVideo function to be always included in the path of the offered media stream, for example: for the support of features such as MBMS, lawful interception and recording. Other examples can exist.

- 2) shall replace the IP address and port number in the received SDP answer with the IP address and port number of the participating MCVideo function, for the accepted media-transmission control entity, if present in the received SDP offer.

NOTE 2: If the participating MCVideo function and the controlling MCVideo function are in the same MCVideo server, and the participating MCVideo function does not have a dedicated IP address or a dedicated port number for media transmission control or media stream, the replacement of the IP address or the port number is omitted.

6.3.2.1.3 Sending an INVITE request on receipt of an INVITE request

This subclause is referenced from other procedures.

When generating an initial SIP INVITE request according to 3GPP TS 24.229 [11], on receipt of an incoming SIP INVITE request, the participating MCVideo function:

- 1) shall include in the SIP INVITE request all Accept-Contact header fields and all Reject-Contact header fields, with their feature tags and their corresponding values along with parameters according to rules and procedures of IETF RFC 3841 [20] if included in the incoming SIP INVITE request;
- 2) should include the Session-Expires header field according to IETF RFC 4028 [23]. It is recommended that the "refresher" header field parameter is omitted. If included, the "refresher" header field parameter shall be set to "uac";
- 3) shall include the option tag "timer" in the Supported header field;
- 4) shall copy the contents of the P-Asserted-Identity header field of the incoming SIP INVITE request to the P-Asserted-Identity header field of the outgoing SIP INVITE request;
- 5) shall include the g.3gpp.mcvideo media feature tag into the Contact header field of the outgoing SIP INVITE request;
- 6) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), into the P-Asserted-Service header field of the outgoing SIP INVITE request;
- 7) if the incoming SIP INVITE request contained a MIME resource-lists body with the MCVideo ID of the invited MCVideo user, shall copy the MIME resource-lists body, according to rules and procedures of IETF RFC 5366 [37];
- 8) if the incoming SIP INVITE request contained an application/vnd.3gpp.mcvideo-info+xml MIME body, shall copy the contents of the application/vnd.3gpp.mcvideo-info+xml MIME body of the incoming SIP INVITE request to the outgoing SIP INVITE request; and
- 9) if the incoming SIP INVITE request contained an application/vnd.3gpp.location-info+xml MIME body, shall copy the contents of the application/vnd.3gpp.location-info+xml MIME body of the incoming SIP INVITE request to the outgoing SIP INVITE request.

6.3.2.1.4 Response to an INVITE request

6.3.2.1.4.1 Provisional responses

NOTE: This subclause is referenced from other procedures

When sending SIP provisional responses other than the SIP 100 (Trying) response, the participating MCVideo function shall generate a SIP provisional response according to 3GPP TS 24.229 [11] and:

- 1) shall include the following in the Contact header field:

- a) the g.3gpp.mcvideo media feature tag;
 - b) the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo";
 - c) the isfocus media feature tag; and
 - d) an MCVideo session identity mapped to the MCVideo session identity if provided in the Contact header field of the incoming provisional response;
- 2) shall include the "norefersub" option tag in a Supported header field in accordance with 3GPP TS 24.229 [11];
 - 3) may include a Resource-Share header field in accordance with subclause 5.7.1.20.2 in 3GPP TS 24.229 [11]; and
 - 4) if the incoming SIP provisional response contained an application/vnd.3gpp.mcvideo-info+xml MIME body, shall copy the application/vnd.3gpp.mcvideo-info+xml MIME body to the outgoing SIP provisional response.

6.3.2.1.4.2 Final response

This subclause is referenced from other procedures.

When sending SIP 200 (OK) responses, the participating MCVideo function shall generate a SIP 200 (OK) response according to 3GPP TS 24.229 [11] and:

- 1) shall include the option tag "timer" in a Require header field;
- 2) shall include the Session-Expires header field according to rules and procedures of IETF RFC 4028 [23], "UAS Behavior". If the "refresher" parameter is not included in the received request, the "refresher" parameter in the Session-Expires header field shall be set to "uac";
- 3) shall include the following in the Contact header field:
 - a) the g.3gpp.mcvideo media feature tag;
 - b) the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo"; and
 - c) the isfocus media feature tag;
- 4) shall include the option tag "tdialog" in a Supported header field according to rules and procedures of IETF RFC 4538 [32];
- 5) shall include the option tag "norefersub" in a Supported header field according to rules and procedures of IETF RFC 4488 [31];
- 6) may include a Resource-Share header field in accordance with subclause 5.7.1.20.2 in 3GPP TS 24.229 [11]; and
- 7) if the incoming SIP 200 (OK) response contained an application/vnd.3gpp.mcvideo-info+xml MIME body, shall copy the application/vnd.3gpp.mcvideo-info+xml MIME body to the outgoing SIP 200 (OK) response.

6.3.2.1.5 Sending a SIP BYE request on receipt of a SIP BYE request

Upon receiving a SIP BYE request from the MCVideo client, the participating MCVideo function:

- 1) shall interact with the media plane as specified in 3GPP TS 24.581 [5];
- 2) shall generate a SIP BYE request as specified in 3GPP TS 24.229 [11];
- 3) shall set the Request-URI to the MCVideo session identity as included in the received SIP BYE request;
- 4) shall copy the contents of the P-Asserted-Identity header field of the incoming SIP BYE request to the P-Asserted-Identity header field of the outgoing SIP BYE request; and
- 5) shall send the SIP BYE request toward the controlling MCVideo function, according to 3GPP TS 24.229 [11].

Upon receiving a SIP 200 (OK) response to the SIP BYE request the terminating MCVideo function shall forward a SIP 200 (OK) response to the MCVideo client and shall interact with the media plane as specified in 3GPP TS 24.581 [5] for releasing media plane resources associated with the SIP session with the controlling MCVideo function.

6.3.2.1.6 Priority call conditions

This subclause contains common procedures to be used for MCVideo emergency group calls and MCVideo imminent peril group calls.

6.3.2.1.6.1 Determining authorisation for originating a priority group call

When the participating MCVideo function receives a request from the MCVideo client to originate an MCVideo emergency group call and needs to determine if the request is an authorised request for an MCVideo emergency call, the participating MCVideo function shall check the following:

- 1) if the <allow-emergency-group-call> element of the <ruleset> element of the MCVideo user profile document identified by the MCVideo ID of the calling user (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "true" and:
 - a) if the "entry-info" attribute of the <entry> element of the <MCVideoGroupInitiation> element of the <EmergencyCall> element contained within the <MCVideo-group-call> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "DedicatedGroup" and if the <uri-entry> element of the <entry> element of the <MCVideoGroupInitiation> element contains the identity of the MCVideo group targeted by the calling MCVideo user; or
 - b) if the "entry-info" attribute of the <entry> element of the <MCVideoGroupInitiation> element of the <EmergencyCall> contained within the <MCVideo-group-call> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "UseCurrentlySelectedGroup";

then the participating MCVideo function shall consider the MCVideo emergency group call request to be an authorised request for an MCVideo emergency group call;

In all other cases, the participating MCVideo function shall consider the request to originate an MCVideo emergency group call to be an unauthorised request to originate an MCVideo emergency group call.

When the participating MCVideo function receives a request from the MCVideo client to originate an MCVideo imminent peril group call and needs to determine if the request is an authorised request for an MCVideo imminent peril group call the participating MCVideo function shall check the following:

- 1) if the <allow-imminent-peril-call> element of <ruleset> element of the MCVideo user profile document identified by the MCVideo ID of the calling user (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "true"; and
 - a) if the "entry-info" attribute of the <MCVideoGroupInitiation> element contained within the <ImminentPerilCall> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "DedicatedGroup" and if the <uri-entry> element of the <entry> element of the <MCVideoGroupInitiation> element contains the identity of the MCVideo group targeted by the calling MCVideo user; or
 - b) if the "entry-info" attribute of the <entry> element of the <MCVideoGroupInitiation> element contained within the <ImminentPerilCall> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "UseCurrentlySelectedGroup";

then the participating MCVideo function shall consider the MCVideo imminent peril group call request to be an authorised request for an MCVideo emergency group call;

In all other cases, the participating MCVideo function shall consider the request to originate an MCVideo imminent peril group call to be an unauthorised request to originate an MCVideo imminent peril call.

6.3.2.1.6.2 Determining authorisation for initiating or cancelling an MCVideo emergency alert

If the participating MCVideo function receives a SIP request from the MCVideo client including a request for an MCVideo emergency alert and:

- 1) if the <allow-activate-emergency-alert> element of the <ruleset> element of the MCVideo user profile document identified by the MCVideo ID of the calling MCVideo user (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "true"; and

- 2) if the "entry-info" attribute of the <entry> element of the <EmergencyAlert> element contained within the <MCVideo-group-call> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of:
 - a) "DedicatedGroup", and if the <uri-entry> element of the <entry> element of the <EmergencyAlert> element of the <MCVideo-group-call> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) contains the MCVideo group identity of the MCVideo group targeted by the calling MCVideo user; or
 - b) "UseCurrentlySelectedGroup" and the <allow-MCVideo-emergency-alert> element of the <list-element> of the group document identified by the MCVideo group identity targeted for the emergency alert is set to a value of "true" as specified in 3GPP TS 24.481 [24].

then the MCVideo emergency alert request shall be considered to be an authorised request for an MCVideo emergency alert. In all other cases, it shall be considered to be an unauthorised request for an MCVideo emergency alert.

If the participating MCVideo function receives a SIP request from the MCVideo client including a request to cancel an MCVideo emergency alert to an MCVideo group, and if the <allow-cancel-emergency-alert> element of the <ruleset> element of the MCVideo user profile document identified by the MCVideo ID of the calling MCVideo user (see the MCVideo user profile document in 3GPP TS 24.484 [25]) is set to a value of "true", then the MCVideo emergency alert cancellation request shall be considered to be an authorised request to cancel an MCVideo emergency alert. In all other cases, it shall be considered to be an unauthorised request to cancel an MCVideo emergency alert.

6.3.2.1.6.3 Validate priority request parameters

This subclause is referenced from other procedures.

To validate the combinations of <emergency-ind>, <imminentperil-ind> and <alert-ind> which are received in SIP requests, the participating MCVideo function shall follow the procedures specified in subclause 6.3.3.1.17.

6.3.2.1.6.4 Retrieving Resource-Priority header field values

This subclause is referenced from other procedures.

The participating MCVideo function shall follow the procedures specified in subclause 6.3.3.1.19 with the clarification that references in that procedure to the controlling MCVideo function should be replaced with references to the participating MCVideo function.

6.3.2.1.7 Generating a SIP re-INVITE request on receipt of a SIP re-INVITE request

This subclause is referenced from other procedures.

When generating a SIP re-INVITE request according to 3GPP TS 24.229 [11] on receipt of an incoming SIP re-INVITE request, the participating MCVideo function:

- 1) if the incoming SIP re-INVITE request contained a MIME resource-lists body with the MCVideo ID of the invited MCVideo user, shall copy the MIME resource-lists body, according to rules and procedures of IETF RFC 5366 [37];
- 2) if the incoming SIP re-INVITE request contained an application/vnd.3gpp.mcvideo-info+xml MIME body, shall copy the application/vnd.3gpp.mcvideo-info+xml MIME body; and
- 3) if the incoming SIP re-INVITE request contained an application/vnd.3gpp.location-info+xml MIME body, shall copy the application/vnd.3gpp.location-info+xml MIME body.

6.3.2.1.8 Sending a SIP INVITE request on receipt of SIP 3xx response

This subclause is referenced from other procedures.

Upon:

- 1) having sent a SIP INVITE request to the controlling MCVideo function; and
- 2) having received a SIP 302 (Moved Temporarily) response from the controlling MCVideo function with:

- a) a Contact header field containing a SIP-URI; and
- b) an application/vnd.3gpp.mcvideo-info+xml MIME body with an <mcvideo-request-uri> element;

the participating MCVideo function:

- 1) shall generate a SIP INVITE request with the Request-URI set to the contents of the Contact header field of the SIP 302 (Moved Temporarily) response;
- 2) shall include in the SIP INVITE request all Accept-Contact header fields and all Reject-Contact header fields, with their feature tags and their corresponding values along with parameters according to rules and procedures of IETF RFC 3841 [20] if included in the original incoming SIP INVITE request from the MCVideo client;
- 3) should include the Session-Expires header field according to IETF RFC 4028 [23]. It is recommended that the "refresher" header field parameter is omitted. If included, the "refresher" header field parameter shall be set to "uac";
- 4) shall include the option tag "timer" in the Supported header field;
- 5) shall copy the contents of the P-Asserted-Identity header field of the incoming SIP INVITE request from the client to the P-Asserted-Identity header field of the outgoing SIP INVITE request;
- 6) shall include the g.3gpp.mcvideo media feature tag into the Contact header field of the outgoing SIP INVITE request;
- 7) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo" in the Contact header field of the outgoing SIP INVITE request;
- 8) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), into the P-Asserted-Service header field of the outgoing SIP INVITE request;
- 9) if an SIP INVITE request was received from the client containing an application/vnd.3gpp.mcvideo-info+xml MIME body, shall copy the contents of the application/vnd.3gpp.mcvideo-info+xml MIME body of the original incoming SIP INVITE request to the outgoing SIP INVITE request;
- 10) shall copy the contents of the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body received in the SIP 302 (Moved Temporarily) response, to the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the outgoing SIP INVITE request;
- 11) shall set the <mcvideo-calling-user-identity> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP INVITE request to the MCVideo ID of the calling user that was determined when the participating MCVideo function received the SIP INVITE request request from the client ; and
- 12) if the <session-type> element is received in the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP 3xx response, shall set the <session-type> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP INVITE request to the value of the <session-type> element received in the SIP 3xx response.

6.3.2.2 Requests terminated to the served MCVideo user

6.3.2.2.1 SDP offer generation

The participating MCVideo function shall follow the procedures in subclause 6.3.2.1.1.

6.3.2.2.2 SDP answer generation

6.3.2.2.2.1 On-demand session

The participating MCVideo function shall follow the procedures in subclause 6.3.2.1.2.1.

6.3.2.2.3 SIP INVITE request towards the terminating MCVideo client

The participating MCVideo function shall generate an initial SIP INVITE request according to 3GPP TS 24.229 [11] and:

- 1) shall include in the SIP INVITE request all Accept-Contact header fields and all Reject-Contact header fields, with their feature tags and their corresponding values along with parameters according to rules and procedures of IETF RFC 3841 [20] if included in the incoming SIP INVITE request;
- 2) should include the Session-Expires header field according to IETF RFC 4028 [23]. It is recommended that the "refresher" header field parameter is omitted. If included, the "refresher" header field parameter shall be set to "uac";
- 3) shall include the option tag "timer" in the Supported header field;
- 4) shall include the following in the Contact header field:
 - a) the g.3gpp.mcvideo media feature tag;
 - b) the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo";
 - c) the isfocus media feature tag;
 - d) an MCVideo session identity mapped to the MCVideo session identity provided in the Contact header field of the incoming SIP INVITE request; and
 - e) any other uri-parameter provided in the Contact header field of the incoming SIP INVITE request;
- 5) shall include the option tag "tdialog" in a Supported header field according to rules and procedures of IETF RFC 4538 [32];
- 6) shall include the option tag "norefersub" in a Supported header field according to rules and procedures of IETF RFC 4488 [31];
- 7) may include a Resource-Share header field in accordance with subclause 5.7.1.20.3 in 3GPP TS 24.229 [11]; and
- 8) if the incoming SIP INVITE request contained an application/vnd.3gpp.mcvideo-info+xml MIME body, shall copy the application/vnd.3gpp.mcvideo-info+xml MIME body to the outgoing SIP INVITE request.

6.3.2.2.4 Response to a SIP INVITE request

6.3.2.2.4.1 Provisional response

This subclause is referenced from other procedures.

When sending a SIP provisional response other than the SIP 100 (Trying) response to the SIP INVITE request, the participating MCVideo function shall generate a SIP provisional response according to 3GPP TS 24.229 [11] and:

- 1) shall include the following in the Contact header field:
 - a) the g.3gpp.mcvideo media feature tag; and
 - b) the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo";
- 2) if the outgoing SIP provisional response is to be sent in response to the receipt of a SIP provisional response and the response contains an application/vnd.3gpp.mcvideo-info+xml MIME body, shall copy the application/vnd.3gpp.mcvideo-info+xml MIME body to the outgoing SIP provisional response; and
- 3) if the incoming SIP INVITE request included the Supported header field with the value "100rel" and according to local policy, may include the Require header field with the value "100rel".

6.3.2.2.4.2 Final response

This subclause is referenced from other procedures.

When sending SIP 200 (OK) responses, the participating MCVideo function shall generate a SIP 200 (OK) response according to 3GPP TS 24.229 [11] and:

- 1) shall include the option tag "timer" in a Require header field;

- 2) shall include the Session-Expires header field according to rules and procedures of IETF RFC 4028 [23], "UAS Behavior". If no "refresher" parameter was included in the SIP INVITE request, the "refresher" parameter in the Session-Expires header field shall be set to "uas";
- 3) shall include the following in the Contact header field:
 - a) the g.3gpp.mcvideo media feature tag;
 - b) the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo"; and
 - c) an MCVideo session identity mapped to the MCVideo session identity provided in the Contact header field of the received SIP INVITE request from the controlling MCVideo function;
- 4) shall include the option tag "tdialog" in a Supported header field according to rules and procedures of IETF RFC 4538 [32]; and
- 5) if the incoming SIP response contained an application/vnd.3gpp.mcvideo-info+xml MIME body, shall copy the application/vnd.3gpp.mcvideo-info+xml MIME body to the outgoing SIP 200 (OK) response.

6.3.2.2.5 Automatic Commencement Mode

6.3.2.2.5.1 General

When receiving a "SIP INVITE request for terminating participating MCVideo function" that requires automatic commencement mode:

- 1) if:
 - a) the invited MCVideo client has one or more pre-established sessions without an associated MCVideo session;
 - b) the media-level sections for the offered MCVideo speech media stream are the same as the media-level sections for MCVideo speech media stream in an existing pre-established session; and
 - c) the media-level section of the offered media-transmission control entity is the same as the media-level section for media-transmission control entity in an existing pre-established session;then the participating MCVideo function shall perform the actions specified in subclause 6.3.2.2.5.3; or
- 2) otherwise the participating MCVideo function shall perform the actions specified in subclause 6.3.2.2.5.2.

6.3.2.2.5.2 Automatic commencement for On-Demand session

When receiving a "SIP INVITE request for terminating participating MCVideo function" for an on-demand session that requires automatic commencement mode the participating MCVideo function:

- 1) if:
 - a) the incoming SIP INVITE request contained a Priv-Answer-Mode header field set to the value of "Auto";
 - b) no Answer-Mode header field or Priv-Answer-Mode header field were received in the incoming SIP INVITE request and the Answer-Mode Indication received in the application/poc-settings+xml MIME body received from the invited MCVideo client as defined in subclause 7.3.3 or subclause 7.3.4 is set to "auto-answer"; or
 - c) the incoming SIP INVITE request contained an Answer-Mode header field set to "Auto" and the Answer-Mode Indication received in the application/poc-settings+xml MIME body received from the invited MCVideo client as defined in subclause 7.3.3 or subclause 7.3.4 is set to "auto-answer";then:
 - a) shall generate a SIP 183 (Session Progress) response to the "SIP INVITE request for terminating participating MCVideo function" as specified in subclause 6.3.2.2.4.1; and

NOTE: The SIP 183 (session Progress) response can be sent reliably or unreliably depending on the content of the received SIP INVITE request. Regardless of if the SIP 183 (Session Progress) response is sent reliably or unreliably, SDP is not included in the SIP 183 (Session Progress) response.

- b) shall set the P-Answer-State header field to "Unconfirmed" in the SIP 183 (Session Progress) response;
- 2) shall copy the public user identity contained in the Request-URI of the incoming "SIP INVITE request for terminating participating MCVideo function" to the P-Asserted-Identity header field of the SIP 183 (Session Progress) response;
- 3) shall generate a SIP INVITE request as specified in subclause 6.3.2.2.3;
- 4) shall set the Request-URI to the public user identity associated to the MCVideo ID of the MCVideo user to be invited;
- 5) shall perform the procedures specified in subclause 6.3.2.2.9 to include any MIME bodies in the received SIP INVITE request, into the outgoing SIP INVITE request;
- 6) shall copy the contents of the P-Asserted-Identity header field of the incoming "SIP INVITE request for terminating participating MCVideo function" to the P-Asserted-Identity header field of the outgoing SIP INVITE request;
- 7) if the Priv-Answer-Mode header field is present in the incoming SIP INVITE request with a value of "Auto", shall include a Priv-Answer-Mode header field with the value "Auto" in the outgoing SIP INVITE request. Otherwise, if the Answer-Mode header field is present in the incoming SIP INVITE request, the participating MCVideo function shall include an Answer-Mode header field with the value "Auto" in the outgoing SIP INVITE request;
- 8) if no Answer-Mode header field or Priv-Answer-Mode header field were received in the incoming SIP INVITE request and the Answer-Mode Indication received in the application/poc-settings+xml MIME body received from the invited MCVideo client as defined in subclause 7.3.3 or subclause 7.3.4 is set to "auto-answer", shall set the Answer-Mode header field to "Auto" in the outgoing SIP INVITE request;
- 9) shall include in the SIP INVITE request an SDP offer based on the SDP offer in the received "SIP INVITE request for terminating participating MCVideo function" as specified in subclause 6.3.2.2.1;
- 10) if the received SIP INVITE request contains a Resource-Priority header field, shall include a Resource-Priority header field with the contents set as in the received Resource-Priority header field; and
- 11) shall send the SIP INVITE request towards the MCVideo client according to 3GPP TS 24.229 [11].

If the SIP 183 (Session Progress) response was sent reliably, then upon receiving a SIP PRACK request, the participating MCVideo function shall generate a SIP 200 (OK) response to the SIP PRACK request and forward the SIP 200 (OK) response, according to 3GPP TS 24.229 [11].

Upon receiving a SIP 200 (OK) response to the above SIP INVITE request sent to the MCVideo client, the participating MCVideo function:

- 1) if the SIP 183 (Session Progress) was sent unreliably, shall send the SIP 200 (OK) response immediately; and
- 2) if the SIP 183 (Session Progress) was sent reliably and,
 - a) if the SIP PRACK request to the SIP 183 (Session Progress) response has been received by the participating MCVideo function and the SIP 200 (OK) response to the SIP PRACK request has been sent, shall send the SIP 200 (OK) response immediately;
 - b) if the SIP PRACK request to the SIP 183 (Session Progress) response has not yet been received, then upon receipt of the SIP PRACK request, the participating MCVideo function shall generate a SIP 200 (OK) response to the SIP PRACK request and forward the SIP 200 (OK) response, according to 3GPP TS 24.229 [11], before sending the SIP 200 (OK) response to the "SIP INVITE request for terminating participating MCVideo function".

When the participating MCVideo function sends the SIP 200 (OK) response to the "SIP INVITE request for terminating participating MCVideo function", the participating MCVideo function:

- 1) shall generate a SIP 200 (OK) response as described in the subclause 6.3.2.2.4.2;

- 2) shall include in the SIP 200 (OK) response an SDP answer based on the SDP answer in the received SIP 200 (OK) response as specified in subclause 6.3.2.2.2.1;
- 3) shall copy the P-Asserted-Identity header field from the incoming SIP 200 (OK) response to the outgoing SIP 200 (OK) response;
- 4) shall interact with the media plane as specified in 3GPP TS 24.581 [5]; and
- 5) shall forward the SIP 200 (OK) response according to 3GPP TS 24.229 [11].

The participating MCVideo function shall forward any other SIP response that does not contain SDP along the signalling path to the originating network according to 3GPP TS 24.229 [11].

6.3.2.2.6 Manual Commencement Mode

6.3.2.2.6.1 General

When receiving a "SIP INVITE request for terminating participating MCVideo function" that requires manual commencement mode:

- 1) if:
 - a) the invited MCVideo client has one or more pre-established sessions without an associated MCVideo session;
 - b) the media-level sections for the offered MCVideo speech media stream are the same as the media-level section for MCVideo speech media stream in the existing pre-established session; and
 - c) the media-level section of the offered media-transmission control entity is the same as the media-level section for media-transmission control entity in the existing pre-established session;

then the participating MCVideo function shall perform the actions specified in subclause 6.3.2.2.6.3; or

- 2) otherwise the participating MCVideo function shall perform the actions specified in subclause 6.3.2.2.6.2.

6.3.2.2.6.2 Manual commencement for On-Demand session

When receiving a "SIP INVITE request for terminating participating MCVideo function" for an on-demand session that requires manual commencement mode the participating MCVideo function:

- 1) shall generate a SIP INVITE request as specified in subclause 6.3.2.2.3;
- 2) shall set the Request-URI to the public user identity associated to the MCVideo ID of the MCVideo user to be invited;
- 3) shall perform the procedures specified in subclause 6.3.2.2.9 to include any MIME bodies in the received SIP INVITE request;
- 4) if the Answer-Mode header field is present in the incoming SIP INVITE request, participating MCVideo function, shall include an Answer-Mode header field with the value "Manual";
- 5) if no Answer-Mode header field was received in the incoming SIP INVITE request and the Answer-Mode Indication received in the application/poc-settings+xml MIME body received from the invited MCVideo client as defined in subclause 7.3.3 or subclause 7.3.4 is set to "manual-answer", shall set the Answer-Mode header field to "Manual" in the outgoing SIP INVITE request;
- 6) shall copy the contents of the P-Asserted-Identity header field of the incoming "SIP INVITE request for terminating participating MCVideo function" to the P-Asserted-Identity header field of the outgoing SIP INVITE request;
- 7) shall include in the SIP INVITE request an SDP offer based on the SDP offer in the received "SIP INVITE request for terminating participating MCVideo function" as specified in subclause 6.3.2.2.1;
- 8) if the received SIP INVITE request contains a Resource-Priority header field, shall include a Resource-Priority header field with the contents set as in the received Resource-Priority header field; and

9) shall send the SIP INVITE request towards the MCVideo client according to 3GPP TS 24.229 [11].

Upon receiving a SIP 180 (Ringing) response to the above SIP INVITE request, the participating MCVideo function:

NOTE 1: A SIP 180 (Ringing) response is received from a terminating MCVideo client in the case of a private call.

- 1) shall generate a SIP 180 (Ringing) response as specified in subclause 6.3.2.2.4.1;
- 2) shall include the P-Asserted-Identity header field as received in the incoming SIP 180 (Ringing) response; and
- 3) shall forward the SIP 180 (Ringing) response according to 3GPP TS 24.229 [11].

Upon receiving a SIP 183 (Session Progress) response to the above SIP INVITE request, the participating MCVideo function:

NOTE 2: A SIP 183 (Session Progress) response can be received from a terminating MCVideo client in the case of a group call.

- 1) shall generate a SIP 183 (Session Progress) response as specified in subclause 6.3.2.2.4.1;
- 2) shall include the P-Asserted-Identity header field as received in the incoming SIP 183 (Session Progress) response;
- 3) shall include the P-Answer-State header field if received in the incoming SIP 183 (Session Progress) request; and
- 4) shall forward the SIP 183 (Session Progress) response according to 3GPP TS 24.229 [11].

Upon receiving a SIP 200 (OK) response to the SIP INVITE request sent to the MCVideo client, the participating MCVideo function:

When the participating MCVideo function sends the SIP 200 (OK) response the participating MCVideo function:

- 1) shall generate a SIP 200 (OK) response as described in the subclause 6.3.2.2.4.2;
- 2) shall include in the SIP 200 (OK) response an SDP answer based on the SDP answer in the received SIP 200 (OK) response as specified in subclause 6.3.2.2.2.1;
- 3) shall copy the P-Asserted-Identity header field from the incoming SIP 200 (OK) response to the outgoing SIP 200 (OK) response;
- 4) shall interact with the media plane as specified in 3GPP TS 24.581 [5]; and
- 5) shall forward the SIP 200 (OK) response according to 3GPP TS 24.229 [11].

The participating MCVideo function shall forward any other SIP response that does not contain SDP along the signalling path to the originating network according to 3GPP TS 24.229 [11].

6.3.2.2.7 SIP MESSAGE request towards the terminating MCVideo client

This subclause is referenced from other procedures.

When receiving a SIP MESSAGE request containing:

- an application/vnd.3gpp.mcvideo-info+xml MIME body; and
- a text/plain MIME body;

the participating MCVideo function:

- 1) shall verify if a binding exists between the public user identity in the Request-URI of the SIP MESSAGE request and an MCVideo ID;
- 2) if a binding does not exist between the public user identity and a MCVideo ID or a binding exists, but the validity period of the binding has expired, shall reject the SIP MESSAGE request with a SIP 404 (Not Found) response and not continue with any of the remaining steps;

- 3) shall verify that the MCVideo ID in the <mcvideo-request-uri> matches the binding in the participating MCVideo function, and if the match fails, shall reject the SIP MESSAGE request with a SIP 404 (Not Found) response and not continue with any of the remaining steps;
- 4) shall generate a SIP MESSAGE request accordance with 3GPP TS 24.229 [11] and IETF RFC 3428 [17];
- 5) shall include in the SIP MESSAGE request all Accept-Contact header fields and all Reject-Contact header fields, with their feature tags and their corresponding values along with parameters according to rules and procedures of IETF RFC 3841 [20] that were received (if any) in the incoming SIP MESSAGE request;
- 6) shall set the Request-URI of the outgoing SIP MESSAGE request to the public user identity that was in the Request-URI of the incoming SIP MESSAGE request;
- 7) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body with a <mcvideo-request-uri> element set to the MCVideo ID of the MCVideo user that was in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the incoming SIP MESSAGE request;
- 8) shall copy the "text/plain" MIME body from the incoming SIP MESSAGE request to the outgoing SIP MESSAGE request;
- 9) shall copy the contents of the P-Asserted-Identity header field of the incoming SIP MESSAGE request to the P-Asserted-Identity header field of the outgoing SIP INVITE request; and
- 10) shall send the SIP MESSAGE request towards the MCVideo client according to rules and procedures of 3GPP TS 24.229 [11].

6.3.2.2.8 SIP BYE request towards the terminating MCVideo client

6.3.2.2.8.1 On-demand

Upon receiving a SIP BYE request from the controlling MCVideo function, the participating MCVideo function:

- 1) shall interact with the media plane as specified in subclause 6.4 in 3GPP TS 24.581 [5] for releasing media plane resource associated with the SIP session with the controlling MCVideo function;
- 2) shall generate a SIP BYE request according to 3GPP TS 24.229 [11];
- 3) shall copy the contents of the P-Asserted-Identity header field of the incoming SIP BYE request to the P-Asserted-Identity header field of the outgoing SIP BYE request; and
- 4) shall send the SIP BYE request to the MCVideo client according to 3GPP TS 24.229 [11].

Upon receiving a SIP 200 (OK) response to the SIP BYE request the participating MCVideo function:

- 1) shall send a SIP 200 (OK) response to the SIP BYE request received from the controlling MCVideo function according to 3GPP TS 24.229 [11]; and
- 2) shall interact with the media plane as specified in 3GPP TS 24.581 [5] for releasing media plane resources associated with the SIP session with the MCVideo client.

6.3.2.2.9 Populate MIME bodies

This subclause is referenced from other procedures.

If the incoming SIP request contains an application/vnd.3gpp.mcvideo-info+xml MIME body, the participating MCVideo function:

- 1) if not already copied, shall copy the contents of the application/vnd.3gpp.mcvideo-info+xml MIME body received in the SIP request into an application/vnd.3gpp.mcvideo-info+xml MIME body included in the outgoing SIP request.

If the received SIP request contains an application/vnd.3gpp.location-info+xml MIME body as specified in Annex F.3:

- 1) if not already copied, shall copy the contents of the application/vnd.3gpp.location-info+xml MIME body received in the SIP request into an application/vnd.3gpp.location-info+xml MIME body included in the outgoing SIP request.

If the received SIP request contains an application/resource-lists+xml MIME body:

- 1) if not already copied, shall copy the contents of the application/resource-lists+xml MIME body received in the SIP request into an application/resource-lists+xml MIME body included in the outgoing SIP request.

6.3.2.2.10 Generating a SIP re-INVITE request towards the terminating MCVideo client

This subclause is referenced from other procedures.

The participating MCVideo function shall generate a SIP re-INVITE request according to 3GPP TS 24.229 [11] and:

- 1) shall include the option tag "tdialog" in a Supported header field according to rules and procedures of IETF RFC 4538 [32];
- 2) may include a Resource-Share header field in accordance with subclause 5.7.1.20.3 in 3GPP TS 24.229 [11];
- 3) shall perform the procedures specified in subclause 6.3.2.2.9 to copy any MIME bodies in the received SIP re-INVITE request to the outgoing SIP re-INVITE request; and
- 4) if the received SIP re-INVITE request contains a Resource-Priority header field, shall include a Resource-Priority header field with the contents set as in the received Resource-Priority header field.

6.3.2.2.11 Generating a SIP MESSAGE request towards the terminating MCVideo client

This subclause is referenced from other procedures.

The participating MCVideo function shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [11] and IETF RFC 3428 [17] and:

- 1) shall include in the SIP MESSAGE request all Accept-Contact header fields and all Reject-Contact header fields, with their feature tags and their corresponding values along with parameters according to rules and procedures of IETF RFC 3841 [20] that were received (if any) in the incoming SIP MESSAGE request;
- 2) shall set the Request-URI of the outgoing SIP MESSAGE request to the public user identity associated to the MCVideo ID of the MCVideo user that was in the Request-URI of the incoming SIP MESSAGE request;
- 3) shall populate the outgoing SIP MESSAGE request MIME bodies as specified in subclause 6.3.2.2.9; and
- 4) shall copy the contents of the P-Asserted-Identity header field of the incoming SIP MESSAGE request to the P-Asserted-Identity header field of the outgoing SIP MESSAGE request.

6.6 Confidentiality and Integrity Protection

6.6.1 General

6.6.1.1 Applicability and exclusions

The procedures in subclauses 6.6 apply in general to all procedures described in clause 8, clause 9, clause 10 and clause 11 with the exception that the confidentiality and integrity protection procedures for the registration and service authorisation procedures are described in clause 7.

6.6.1.2 Performing XML content encryption

Whenever the MCVideo UE includes XML elements or attributes pertaining to the data specified in subclause 4.8 in SIP requests or SIP responses, the MCVideo UE shall perform the procedures in subclause 6.6.2.3.1.

Whenever the MCVideo server includes XML elements or attributes pertaining to the data specified in subclause 4.8 in SIP requests or SIP responses, the MCVideo server shall perform the procedures in subclause 6.6.2.3.2, with the

exception that when the MCVideo server receives a SIP request with XML elements or attributes in an MIME body that need to be copied from the incoming SIP request to an outgoing SIP request without modification, the MCVideo server shall perform the procedures specified in subclause 6.6.2.5.

NOTE: The procedures in subclause 6.6.2.3.1 and subclause 6.6.2.3.2 first determine (by referring to configuration) if confidentiality protection is enabled and then call the necessary procedures to encrypt the contents of the XML elements if confidentiality protection is enabled.

6.6.1.3 Performing integrity protection on an XML body

The functional entity shall perform the procedures in the subclause just prior to sending a SIP request or SIP response.

- 1) The MCVideo UE shall perform the procedures in subclause 6.6.3.3.1; and
- 2) The MCVideo server shall perform the procedures in subclause 6.6.3.3.2.

NOTE: The procedures in subclause 6.6.3.3.1 and subclause 6.6.3.3.2 first determine if integrity protection of XML MIME bodies is required and then calls the necessary procedures to integrity protect each XML MIME body if integrity protection is required. Each XML MIME body has its own signature.

6.6.1.4 Verifying integrity of an XML body and decrypting XML elements

Whenever the functional entity (i.e. MCVideo UE or MCVideo server) receives a SIP request or a SIP response, the functional entity shall perform the following procedures before performing any other procedures.

- 1) The functional entity shall determine if integrity protection has been applied to an XML MIME body by following the procedures in subclause 6.6.3.4.1 and if integrity protection has been applied:
 - a) shall use the keying information described in subclause 6.6.3.2 and the procedures described in subclause 6.6.3.4.2 to verify the integrity of the XML MIME body; and
 - b) if the integrity protection checks fail shall not perform any further procedures in this clause;
- 2) The functional entity shall determine whether confidentiality protection has been applied to XML elements in XML MIME bodies in a SIP request or SIP response, pertaining to the data specified in subclause 4.8, by following the procedures in subclause 6.6.2.4.1, and if confidentiality protection has been applied:
 - a) shall use the keying information described in subclause 6.6.2.2 along with the procedures described in subclause 6.6.2.4.2 to decrypt the received values; and
 - b) if any decryption procedures fail, shall not perform any further procedures in this clause.

6.6.2 Confidentiality Protection

6.6.2.1 General

In general, confidentiality protection is applied to specific XML elements and attributes in XML MIME bodies in SIP requests and responses as specified in subclause 4.8.

Configuration for applying confidentiality protection is not selective to a specific XML element or attribute of the data described in subclause 4.8. If configuration for confidentiality protection is turned on, then all XML elements and attributes described in subclause 4.8 are confidentiality protected. If configuration for confidentiality protection is turned off, then no XML content in SIP requests and SIP responses are confidentiality protected.

6.6.2.2 Keys used in confidentiality protection procedures

Confidentiality protection uses an XPK to encrypt the data which (depending on who is the sender and who is the receiver of the encrypted information) can be a CSK or an SPK as specified in subclause 4.8. An XPK-ID (CSK-ID/SPK-ID) is used to key the XPK (CSK/SPK). It is assumed that before the procedures in this subclause are called, the CSK/CSK-ID and/or SPK/SPK-ID are available on the sender and recipient of the encrypted content as described in subclause 4.8.

The procedures in subclause 6.6.2.3 and subclause 6.6.2.4 are used with a XPK equal to the CSK and a XPK-ID equal to the CSK-ID in the following circumstances as described in 3GPP TS 33.180 [8]:

- 1) MCVideo client sends confidentiality protected content to an MCVideo server; and
- 2) MCVideo server sends confidentiality protected content to an MCVideo client.

The procedure in subclause 6.6.2.3 and subclause 6.6.2.4 are used with a XPK equal to the SPK and a XPK-ID equal to the SPK-ID in the following circumstances as described in 3GPP TS 33.180 [8]:

- 1) MCVideo server sends confidentiality protected content to an MCVideo server in the same domain; and
- 2) MCVideo server sends confidentiality protected content to an MCVideo server in another domain.

6.6.2.3 Procedures for sending confidentiality protected content

6.6.2.3.1 MCVideo client

If the <confidentiality-protection> element in the Service Configuration document as specified in 3GPP TS 24.484 [25] is set to "true" or no <confidentiality-protection> element is present in the Service Configuration document, then sending confidentiality protected content from the MCVideo client to the MCVideo server is enabled, and the MCVideo client:

- 1) shall use the appropriate keying information specified in subclause 6.6.2.2;
- 2) shall perform the procedures in subclause 6.6.2.3.3 to confidentiality protect XML elements containing the content described in subclause 4.8; and
- 3) shall perform the procedures in subclause 6.6.2.3.4 to confidentiality protect URIs in XML attributes for URIs described in subclause 4.8.

If the <confidentiality-protection> element in the Service Configuration document as specified in 3GPP TS 24.484 [25] is set to "false", then sending confidentiality protected content from the MCVideo client to the MCVideo server is disabled, and content is included in XML elements and attributes without encryption.

6.6.2.3.2 MCVideo server

If the <confidentiality-protection> element in the Service Configuration document as specified in 3GPP TS 24.484 [25] is set to "true" or no <confidentiality-protection> element is present in the Service Configuration document, then sending confidentiality protected content from the MCVideo server to the MCVideo client is enabled. If the <allow-signalling-protection> element of the <protection-between-mcptt-servers> element is set to "true" in the Service Configuration document as specified in 3GPP TS 24.484 [25] or no <allow-signalling-protection> element is present in the Service Configuration document, then sending confidentiality protected content between MCVideo servers is enabled.

When sending confidentiality protected content, the MCVideo server:

- 1) shall use the appropriate keying information specified in subclause 6.6.2.2;
- 2) shall perform the procedures in subclause 6.6.2.3.3 to confidentiality protect XML elements containing the content described in subclause 4.8, and
- 3) shall perform the procedures in subclause 6.6.2.3.4 to confidentiality protect URIs in XML attributes for URIs described in subclause 4.8.

If the <confidentiality-protection> element in the Service Configuration document as specified in 3GPP TS 24.484 [25] is set to "false", then sending confidentiality protected content from the MCVideo server to the MCVideo client is disabled, and then content is included in XML elements and attributes without encryption.

If the <allow-signalling-protection> element of the <protection-between-mcptt-servers> element in the Service Configuration document as specified in 3GPP TS 24.484 [25] is set to "false", then sending confidentiality protected content between MCVideo servers is disabled, and content is included in XML elements and attributes without encryption.

6.6.2.3.3 Content Encryption in XML elements

The following procedures shall be performed by an MCVideo client or an MCVideo server:

- 1) perform encryption as specified in W3C: "XML Encryption Syntax and Processing Version 1.1", <https://www.w3.org/TR/xmlenc-core1/> [45] subclause 4.3, using the "AES-128-GCM algorithm HMAC" as the encryption algorithm and the XPK as the key; and
- 2) follow the semantic for the element of the MIME body as described in Annex F of the present document, to include the encrypted content in the MIME body ensuring that the necessary XML elements required for confidentiality protection are included as specified in 3GPP TS 33.180 [8].

6.6.2.3.4 Attribute URI Encryption

The following procedures shall be performed by an MCVideo client or an MCVideo server:

- 1) perform encryption as specified in [aes-gcm], using the "AES-128-GCM algorithm HMAC" as the encryption algorithm and the XPK as the key, with a 96 bit randomly selected IV; and
- 2) replace the URI to be protected in the attribute by a URI constructed as follows:
 - a) the URI schema is "[sip](#)";
 - b) the first part of the userinfo part is the base64 encoded result of the encryption of the original attribute value;
 - c) the string ";iv=" is appended to the result of step b);
 - d) the base64 encoding of the IV (section 5 of IETF RFC 4648 [46]) is appended to the result of step c);
 - e) the string ";key-id=" is appended to the result of step d);
 - f) the base64 encoding of the XPK-ID according to 3GPP 33.180 [8] is appended to the result of step e);
 - g) the string ";alg=128-aes-gcm" is appended to the result of step f); and
 - h) the string "@" followed by the domain name for MC Services confidentiality protection as specified in 3GPP TS 23.003 [47] is appended to the result of step g).

6.6.2.4 Procedures for receiving confidentiality protected content

6.6.2.4.1 Determination of confidentiality protected content

The following procedure is used by the MCVideo client or MCVideo server to determine if an XML element is confidentiality protected.

- 1) if an XML element contains the <EncryptedData> XML element, then the content of the XML element is confidentiality protected; and
- 2) if an XML element does not contain the <EncryptedData> XML element, then the content of the XML element is not confidentiality protected.

The following procedure is used by the MCVideo client or MCVideo server to determine if a URI in the XML attribute is confidentiality protected.

- 1) if an XML attribute is a URI with the domain name for MC Services confidentiality protection as specified in the 3GPP TS 23.003 [47], then the URI is confidentiality protected; and
- 2) if an XML attribute is a URI without the domain name for MC Services confidentiality protection as specified in the 3GPP TS 23.003 [47], then the URI is not confidentiality protected.

6.6.2.4.2 Decrypting confidentiality protected content in XML elements

The following procedure shall be performed by an MCVideo client or an MCVideo server to decrypt an individual XML element that has a type of "encrypted" within an XML MIME body:

- 1) if the <EncryptedData> XML element or any of its sub-elements as described in 3GPP TS 33.180 [8] are not present in the MIME body then send a SIP 403 (Forbidden) response with the warning text set to "140 unable to decrypt XML content" in a Warning header field as specified in subclause 4.4, and exit this procedure. Otherwise continue with the rest of the steps;
- 2) perform decryption on the <EncryptedData> element as specified in W3C: "XML Encryption Syntax and Processing Version 1.1", <https://www.w3.org/TR/xmlenc-core1/> [45] subclause 4.4 to decrypt the contents of the <CipherValue> element contained within the <CipherData> element;
- 3) if the decryption procedure fails, then send a SIP 403 (Forbidden) response with the warning text set to "140 unable to decrypt XML content" in a Warning header field as specified in subclause 4.4. Otherwise continue with the rest of the steps; and
- 4) return success of this procedure together with the decrypted XML element.

6.6.2.4.3 Decrypting confidentiality protected URIs in XML attributes

The following procedure shall be performed by an MCVideo client or an MCVideo server to decrypt a URI in an attribute in a XML document:

- 1) the value between ";iv=" and the next ";" provides the base64 encoded value of the 96 bit IV and the value between ";=key-id" and the next ";" defines the key which has been used for encryption, i.e. "CSK" or "SPK"; and
- 2) the original URI is obtained by decrypting the base64 encoded string between the "[sip:](#)" URI prefix and the next ";" using the "AES-128-GCM algorithm HMAC" as the decryption algorithm with IV and key as determined in step 1). This value replaces the encrypted URI as the value of the XML attribute.

6.6.2.5 MCVideo server copying received XML content

The following procedure is executed when an MCVideo server receives a SIP request containing XML MIME bodies, where the content needs to be copied from the incoming SIP request to the outgoing SIP request.

The MCVideo server:

- 1) shall copy the XML elements from the XML MIME body of the incoming SIP request that do not contain a <EncryptedData> XML element, to the same XML body in the outgoing SIP request;
- 2) for each encrypted XML element in the XML MIME body of the incoming SIP request as determined by subclause 6.6.2.4.1:
 - a) shall use the keying information described in subclause 6.6.2.2 to decrypt the content within the XML element by following the procedures specified in subclause 6.6.2.4.2, and shall continue with the steps below if the encrypted XML element was successfully decrypted;
 - b) if confidentiality protection is enabled as specified in subclause 6.6.2.3.2, then for each decrypted XML element:
 - i) shall re-encrypt the content within the XML element using the keying information described in subclause 6.6.2.2 and by following the procedures specified in subclause 6.6.2.3.3; and
 - ii) shall include the re-encrypted content into the same XML MIME body of the outgoing SIP request; and
 - c) if confidentiality protection is disabled as specified in subclause 6.6.2.3.2, shall include the decrypted content in the same XML MIME body of the outgoing SIP request.
- 3) for each encrypted XML URI attribute in the XML MIME body of the incoming SIP request as determined by subclause 6.6.2.4.1:
 - a) shall use the keying information described in subclause 6.6.2.2 to decrypt the URI value of the XML attribute by following the procedures specified in subclause 6.6.2.4.3, and shall continue with the steps below if the encrypted XML attribute value was successfully decrypted;
 - b) if confidentiality protection is enabled as specified in subclause 6.6.2.3.2, then for each decrypted XML element:

- i) shall re-encrypt the URI value of the XML attribute using the keying information described in subclause 6.6.2.2 and by following the procedures specified in subclause 6.6.2.3.4; and
- ii) shall include the re-encrypted attribute value into the same XML MIME body of the outgoing SIP request; and
- c) if confidentiality protection is disabled as specified in subclause 6.6.2.3.2, shall include the decrypted value in the same XML MIME body of the outgoing SIP request.

6.6.3 Integrity Protection of XML documents

6.6.3.1 General

Integrity protection can be applied to a whole XML MIME body. When integrity protection is enabled, all XML MIME bodies transported in SIP requests and responses are integrity protected. The following XML MIME bodies used in the present specification in SIP signalling can be integrity protected:

- application/vnd.3gpp.mcvideo-info+xml;
- application/vnd.3gpp.mcvideo-location-info+xml;
- application/vnd.3gpp.mcvideo-affiliation-command+xml; and
- application/conference-info+xml.

If integrity protection is enabled, and one or more of the XML MIME bodies complying to the types listed above are included in a SIP request or SIP response, then a MIME body of type application/vnd.3gpp.mcvideo-signed+xml is included in the SIP request or SIP response containing one or more signatures pointing to those XML MIME bodies as illustrated in Figure 6.6.3.3-1.

In order to integrity protect the XML MIME bodies listed above in this subclause in SIP requests and SIP responses, the MCVideo client and MCVideo server shall for each MIME body, include the Content-ID header field as specified in IETF RFC 2045 [48] containing a Content-ID ("cid") Uniform Resource Locator (URL) as specified in IETF RFC 2392 [49].

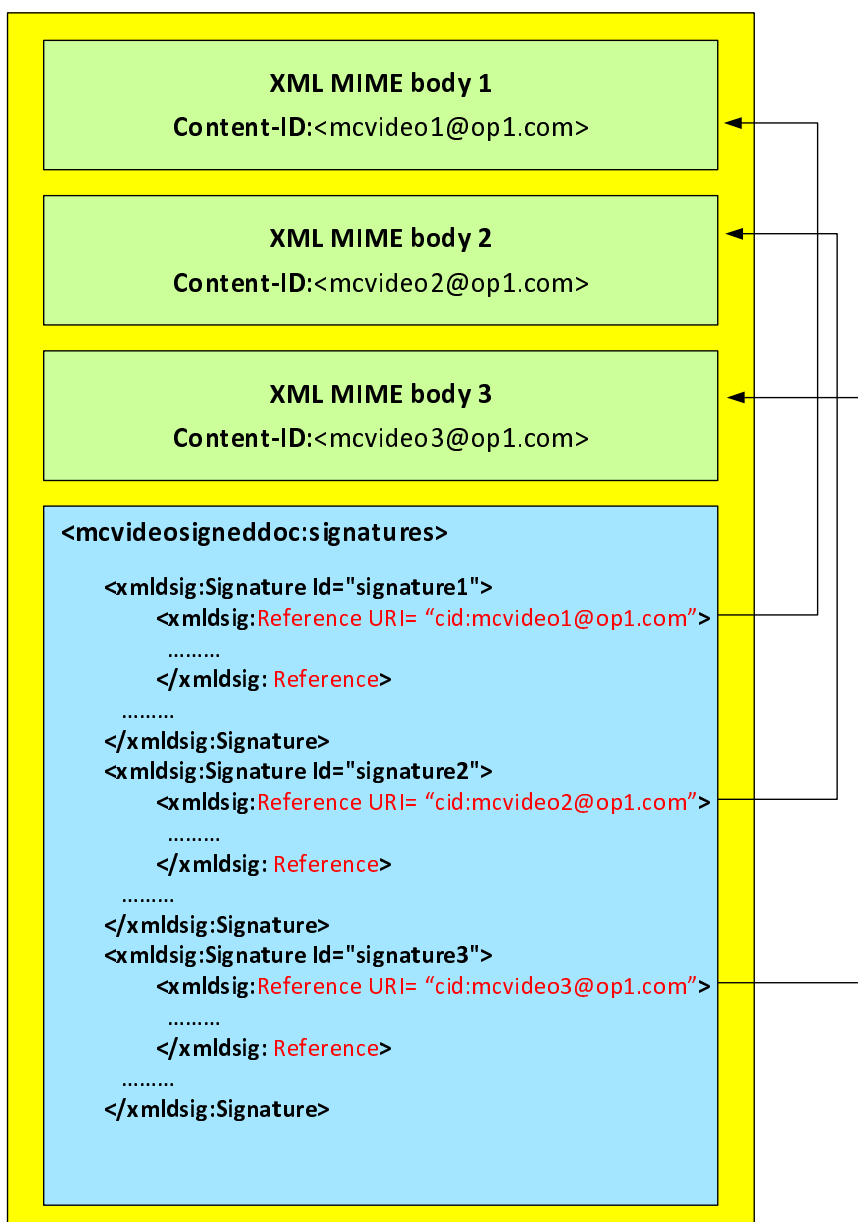


Figure 6.6.3.1-1: Integrity Protection of XML MIME bodies in SIP requests and SIP responses

Each MIME body that is integrity protected is assigned a unique signature.

Configuration for applying integrity protection is not selective to a specific MIME body. If configuration for integrity protection is turned on, then all XML MIME bodies in SIP requests and responses are integrity protected. If configuration for integrity protection is turned off, then no XML MIME bodies in SIP requests and SIP responses are integrity protected.

6.6.3.2 Keys used in integrity protection procedures

Integrity protection uses an XPK to sign the data which (depending on who is the sender and who is the receiver of the signed information) can be a CSK or an SPK as specified in subclause 4.8. An XPK-ID (CSK-ID/SPK-ID) is used to key the XPK (CSK/SPK). It is assumed that before the procedures in subclause 6.6.3.3 and subclause 6.6.3.4 are called, the CSK/CSK-ID and/or SPK/SPK-ID are available on the sender and recipient of the integrity protected content, as described in subclause 4.8.

The procedures in subclause 6.6.3.3 and subclause 6.6.3.4 shall be used with a XPK equal to the CSK and a XPK-ID equal to the CSK-ID in the following circumstances as described in 3GPP TS 33.180 [8]:

- 1) MCVideo client sends integrity protected content to an MCVideo server; and

- 2) MCVideo server sends integrity protected content to an MCVideo client.

The procedure in subclause 6.6.3.3 and subclause 6.6.3.4 shall be used with a XPK equal to the SPK and a XPK-ID equal to the SPK-ID in the following circumstances as described in 3GPP TS 33.180 [8]:

- 1) MCVideo server sends integrity protected content to an MCVideo server in the same domain; and
- 2) MCVideo server sends integrity protected content to an MCVideo server in another domain.

6.6.3.3 Sending integrity protected content

6.6.3.3.1 MCVideo client

If the <integrity-protection> element in the Service Configuration document as specified in 3GPP TS 24.484 [25] is set to "true" or no <integrity-protection> element is present in the Service Configuration document, then sending integrity protected content from the MCVideo client to the MCVideo server is enabled, and the MCVideo client shall use the appropriate keying information specified in subclause 6.6.3.2 and shall perform the procedures in subclause 6.6.3.3.3 to integrity protect XML MIME bodies.

NOTE: Each XML MIME body is integrity protected separately.

If the <integrity-protection> element in the Service Configuration document as specified in 3GPP TS 24.484 [25] is set to "false", then sending integrity protected content from the MCVideo client to the MCVideo server is disabled, and all XML MIME bodies are sent without integrity protection.

6.6.3.3.2 MCVideo server

If the <integrity-protection> element in the Service Configuration document as specified in 3GPP TS 24.484 [25] is set to "true", or no <integrity-protection> element is present in the Service Configuration document, then sending integrity protected content from the MCVideo server to the MCVideo client is enabled. If the <allow-signalling-protection> element of the <protection-between-mcptt-servers> element is set to "true" in the Service Configuration document as specified in 3GPP TS 24.484 [25] or no <allow-signalling-protection> element is present in the Service Configuration document, then sending integrity protected content between MCVideo servers is enabled.

When sending integrity protected content, the MCVideo server shall use the appropriate keying information specified in subclause 6.6.3.2 and shall perform the procedures in subclause 6.6.3.3.3 to integrity protect XML MIME bodies.

NOTE: Each XML MIME body is integrity protected separately.

If the <integrity-protection> element in the Service Configuration document as specified in 3GPP TS 24.484 [25] is set to "false", then sending integrity protected content from the MCVideo server to the MCVideo client is disabled, and all XML MIME bodies are sent without integrity protection.

If the <allow-signalling-protection> element of the <protection-between-mcptt-servers> element in the Service Configuration document as specified in 3GPP TS 24.484 [25] is set to "false", then sending integrity protected content between MCVideo servers is disabled, and content is included in XML elements without encryption.

6.6.3.3.3 Integrity protection procedure

The following procedure shall be performed by the MCVideo client and MCVideo server to integrity protect the XML bodies defined by the MIME types listed in subclause 6.6.3.1:

- 1) include a Content-Type header field set to "application/vnd.3gpp.mcvideo-signed+xml";
- 2) for each of the MIME types defined in subclause 6.6.3.1 where the content defined by these MIME types is to be integrity protected:
 - a) perform reference generation as specified in W3C: "XML Signature Syntax and Processing (Second Edition)", <http://www.w3.org/TR/xmldsig-core> [50] subclause 3.1.1 using the SHA256 algorithm to produce a hash of the MIME body and continue with the procedures below if reference generation is successful;
 - b) perform signature generation as specified in W3C: "XML Signature Syntax and Processing (Second Edition)", <http://www.w3.org/TR/xmldsig-core> [50] subclause 3.1.2 using the HMAC-SHA256 signature

method and the XPK as the key and continue with the procedures below if signature generation is successful; and

- 3) follow the schema defined in Annex F.6.2 and the semantic described in Annex F.6.3 to create the application/vnd.3gpp.mcvideo-signed+xml MIME body containing signatures referring to the XML MIME bodies included in the SIP request or SIP response.

6.6.3.4 Receiving integrity protected content

6.6.3.4.1 Determination of integrity protected content

The following procedure is used by the MCVideo client or MCVideo server to determine if an XML MIME body is integrity protected.

- 1) if the <Signature> XML element is not present in the XML MIME body, then the content is not integrity protected; and
- 2) if the <Signature> XML element is present in the XML MIME body, then the content is integrity protected.

6.6.3.4.2 Verification of integrity protected content

The following procedure is used by the MCVideo client or MCVideo server to verify the integrity of an XML MIME body:

- 1) if the required sub-elements of the <Signature> as described in 3GPP TS 33.180 [8] are not present in the MIME body and if not present, are not known to the sender and recipient by other means, then the integrity protection procedure fails and exit this procedure. Otherwise continue with the rest of the steps;
- 2) perform reference validation on the <Reference> element as specified in W3C: "XML Signature Syntax and Processing (Second Edition)", <http://www.w3.org/TR/xmldsig-core> [50] subclause 3.2.1;
- 3) if reference validation fails, then send a SIP 403 (Forbidden) response towards the functional entity with the warning text set to: "139 integrity protection check failed" in a Warning header field as specified in subclause 4.4, and do not continue with the rest of the steps in this subclause;
- 4) obtain the XPK using the XPK-ID in the received XML body and use it to perform signature validation of the value of the <SignatureValue> element as specified in W3C: "XML Signature Syntax and Processing (Second Edition)", <http://www.w3.org/TR/xmldsig-core> [50] subclause 3.2.2;
- 5) if signature validation fails, then send a SIP 403 (Forbidden) response towards the functional entity with the warning text set to: "139 integrity protection check failed" in a Warning header field as specified in subclause 4.4, and do not continue with the rest of the steps in this subclause; and
- 6) return success of the integrity protection of the XML document passes the integrity protection procedure.

7 Registration and service authorisation

7.1 General

This clause describes the procedures for SIP registration and MCVideo service authorization for the MCVideo client and the MCVideo service. The MCVideo UE can use SIP REGISTER or SIP PUBLISH for MCVideo server settings to perform service authorization for MCVideo. The decision which method to use is based on implementation and on availability of an access-token received as outcome of the user authentication procedure as described in 3GPP TS 24.482 [52].

If another MC service client (e.g. MCPTT, MCDATA) is operating at the same time on the same MC UE as the MCVideo client, then the MCVideo client shares the same SIP registration as the other MC service clients. The SIP REGISTER procedures in this clause are combined with the SIP REGISTER procedures for the other operating MC service clients

to create a single SIP REGISTER request. If other MC service clients are already operating when the MCVideo client registers, then a re-registration is performed containing the parameters for the other operating MC services.

Although the access-token can be the same for the MCVideo service as for other MC services when performing service authorization for MCVideo along with other MC services using SIP REGISTER multipart MIME bodies for each MC service are included in the SIP REGISTER request. The MCVideo server can therefore receive multipart MIME bodies in the SIP REGISTER request. Multiple contact addresses (one per MC service client) can be included in a SIP REGISTER request provided they all contain the same IP address and port number (see 3GPP TS 24.229 [4] for further details of including multiple contact addresses in a single SIP REGISTER request).

If the MCVideo client logs off from the MCVideo service but other MC service clients are to remain registered the MC UE performs a re-registration as specified in 3GPP TS 24.229 [4] without the g.3gpp.mcvideo media feature tag and the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo" in the Contact header field of the SIP REGISTER request but with the parameters for the remaining operating MC service clients.

7.2 MCVideo client procedures

7.2.1 SIP REGISTER request for service authorisation

When the MCVideo client performs SIP registration the MCVideo client shall perform the registration procedures as specified in 3GPP TS 24.229 [11].

The MCVideo client shall include the following media feature tags in the Contact header field of the SIP REGISTER request:

- 1) the g.3gpp.mcvideo media feature tag; and
- 2) the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo".

NOTE 1: If the MCVideo client logs off from the MCVideo service but the MCVideo UE remains registered the MCVideo UE performs a re-registration as specified in 3GPP TS 24.229 [11] without both the g.3gpp.mcvideo media feature tag and the g.3gpp.icsi-ref media feature tag in the Contact header field of the SIP REGISTER request.

If the MCVideo client, upon performing SIP registration:

- 1) has successfully finished the user authentication procedure as described in 3GPP TS 24.482 [52];
- 2) has available an access-token;
- 3) based on implementation decides to use SIP REGISTER for service authorization;
- 4) confidentiality protection is disabled as specified in subclause 6.6.2.3.1; and
- 5) integrity protection is disabled as specified in subclause 6.6.3.3.1;

then the MCVideo client shall include an application/vnd.3gpp.mcvideo-info+xml MIME body as defined in Annex F.1 with the <mcvideo-access-token> element set to the value of the access token received during the user authentication procedures, in the SIP REGISTER request.

NOTE 2: the access-token contains the MCVideo ID of the user.

If the MCVideo client, upon performing SIP registration:

- 1) has successfully finished the user authentication procedure as described in 3GPP TS 24.482 [52];
- 2) has an available access-token;
- 3) based on implementation decides to use SIP REGISTER for service authorization; and
- 4) either confidentiality protection is enabled as specified in subclause 6.6.2.3.1 or integrity protection is enabled as specified in subclause 6.6.3.3.1;

then the MCVideo client:

- 1) shall include an application/mikey MIME body with the CSK as MIKEY-SAKKE I_MESSAGE as specified in 3GPP TS 33.180 [8] in the body of the SIP REGISTER request;
- 2) if confidentiality protection is enabled as specified in subclause 6.6.2.3.1, shall encrypt the received access-token using the CSK and shall include in the body of the SIP REGISTER request, an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideo-access-token> element set to the encrypted access-token, as specified in subclause 6.6.3.3.1;
- 3) if confidentiality protection is disabled as specified in subclause 6.6.2.3.1, shall include an application/vnd.3gpp.mcvideo-info+xml MIME body as defined in Annex F.1 with the <mcvideo-access-token> element set to the value of the access token received during the user authentication procedures; and
- 4) if integrity protection is enabled as specified in subclause 6.6.3.3.1, shall use the CSK to integrity protect the application/vnd.3gpp.mcvideo-info+xml MIME body by following the procedures in subclause 6.6.3.3.3.

7.2.1A Common SIP PUBLISH procedure

This procedure is only referenced from other procedures.

When populating the SIP PUBLISH request, the MCVideo client shall:

- 1) shall set the Request-URI to the public service identity identifying the participating MCVideo function serving the MCVideo user;
- 2) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Preferred-Service header field according to IETF RFC 6050 [14];
- 3) shall set the Event header field to the "poc-settings" value; and
- 4) shall set the Expires header field according to IETF RFC 3903 [12], to 4294967295, if the MCVideo user is not removing the MCVideo service settings, otherwise to remove the MCVideo service settings the MCVideo client shall set the Expires header field to zero.

NOTE 1: 4294967295, which is equal to $2^{32}-1$, is the highest value defined for Expires header field in IETF RFC 3261 [15].

NOTE 2: The expiration timer of the MCVideo client service settings is only applicable for the MCVideo client service settings from the MCVideo client that matches the Instance Identifier URN. The expiration timer of MCVideo user service settings is also updated in the MCVideo server if expiration timer of MCVideo client service settings is updated in the MCVideo server.

NOTE 3: Removing the MCVideo service settings by setting the Expires header field to zero, logs off the MCVideo client from the MCVideo service.

7.2.2 SIP PUBLISH request for service authorisation and MCVideo service settings

If based on implementation the MCVideo client decides to use SIP PUBLISH for MCVideo server settings to also perform service authorization and

- 1) has successfully finished the user authentication procedure as described in 3GPP TS 24.482 [52]; and
- 2) has available an access-token;

then the MCVideo client:

- 1) shall perform the procedures in subclause 7.2.1A;
- 2) if confidentiality protection is disabled as specified in subclause 6.6.2.3.1 and integrity protection is disabled, shall include in the body of the SIP PUBLISH request, an application/vnd.3gpp.mcvideo-info+xml MIME body as specified in Annex F.1 with the <mcvideo-access-token> element set to the value of the access token received during the user authentication procedures;

- 3) if either confidentiality protection is enabled as specified in subclause 6.6.2.3.1 or integrity protection is enabled as specified in subclause 6.6.3.3.1 shall include an application/mikey MIME body with the CSK as MIKEY-SAKKE_I_MESSAGE as specified in 3GPP TS 33.180 [8] in the body of the SIP PUBLISH request;
- 4) if confidentiality protection is enabled as specified in subclause 6.6.2.3.1, shall include in the body of the SIP PUBLISH request an application/vnd.3gpp.mcvideo-info+xml MIME body with:
 - a) the <mcvideo-access-token> element set to the received access-token encrypted using the CSK, as specified in subclause 6.6.2.3.3; and
 - b) the <mcvideo-client-id> element set to the encrypted MCVideo client ID of the originating MCVideo client, as specified in subclause 6.6.2.3.3;
- 5) if confidentiality protection is disabled as specified in subclause 6.6.2.3.1, shall include in the body of the SIP PUBLISH request, an application/vnd.3gpp.mcvideo-info+xml MIME body as specified in Annex F.1 with:
 - a) the <mcvideo-access-token> element set to the value of the access token received during the user authentication procedures in the body of the SIP PUBLISH request; and
 - b) the <mcvideo-client-id> element set to the value of the MCVideo client ID of the originating MCVideo client;
- 6) shall include an application/poc-settings+xml MIME body as defined in 3GPP TS 24.379 [51] containing:
 - a) the Answer-Mode Indication setting in the <am-settings> element of the poc-settings event package set to the current answer mode setting ("auto-answer" or "manual-answer") of the MCVideo client according to IETF RFC 4354 [53]; and
 - b) the <selected-user-profile-index> element set to the value contained in the "user-profile-index" attribute of the selected MCVideo user profile as defined in 3GPP TS 24.484 [25]; and
- 7) if integrity protection is enabled as specified in subclause 6.6.3.3.1, shall use the CSK to integrity protect the application/vnd.3gpp.mcvideo-info+xml MIME body and application/poc-settings+xml MIME body by following the procedures in subclause 6.6.3.3.3.

The MCVideo client shall send the SIP PUBLISH request according to 3GPP TS 24.229 [11].

7.2.3 Sending SIP PUBLISH for MCVideo service settings only

To set, update, remove or refresh the MCVideo service settings, the MCVideo client shall generate a SIP PUBLISH request according 3GPP TS 24.229 [11], IETF RFC 3903 [12] and IETF RFC 4354 [53]. In the SIP PUBLISH request, the MCVideo client:

- 1) shall perform the procedures in subclause 7.2.1A;
- 2) if confidentiality protection is enabled as specified in subclause 6.6.2.3.1, shall include in the body of the SIP PUBLISH request, an application/vnd.3gpp.mcvideo-info+xml MIME body with:
 - a) the <mcvideo-request-uri> element set to the targeted MCVideo ID encrypted using the CSK, as specified in subclause 6.6.2.3.3; and
 - b) the <mcvideo-client-id> element set to the encrypted MCVideo client ID of the originating MCVideo client, as specified in subclause 6.6.2.3.3;
- 3) if confidentiality protection is disabled as specified in subclause 6.6.2.3.1, shall include an application/vnd.3gpp.mcvideo-info+xml MIME body as specified in Annex F.1 with:
 - a) the <mcvideo-request-uri> set to the cleartext targeted MCVideo ID; and
 - b) the <mcvideo-client-id> element set to the value of the MCVideo client ID of the originating MCVideo client;
- 4) shall include an application/poc-settings+xml MIME body as defined in 3GPP TS 24.379 [51] containing:

- a) the Answer-Mode Indication setting in the <am-settings> element of the poc-settings event package set to the current answer mode setting ("auto-answer" or "manual-answer") of the MCVideo client according to IETF RFC 4354 [53]; and
 - b) the <selected-user-profile-index> element set to the value contained in the "user-profile-index" attribute of the selected MCVideo user profile as defined in 3GPP TS 24.484 [25]; and
- 5) if integrity protection is enabled as specified in subclause 6.6.3.3.1, shall use the CSK to integrity protect the application/vnd.3gpp.mcvideo-info+xml MIME body and application/poc-settings+xml MIME body by following the procedures in subclause 6.6.3.3.3.

The MCVideo client shall send the SIP PUBLISH request according to 3GPP TS 24.229 [11].

On receiving the SIP 200 (OK) response to the SIP PUBLISH request the MCVideo client may indicate to the MCVideo User the successful communication of the MCVideo service settings to the MCVideo server.

7.2.4 Determination of MCVideo service settings

In order to discover MCVideo service settings of another MCVideo client of the same MCVideo user or to verify the currently active MCVideo service settings of this MCVideo client, the MCVideo client shall generate an initial SIP SUBSCRIBE request according to 3GPP TS 24.229 [11], IETF RFC 6665 [16], and IETF RFC 4354 [53].

In the SIP SUBSCRIBE request, the MCVideo client:

- 1) shall set the Request-URI to the public service identity identifying the originating participating MCVideo function serving the MCVideo user;
- 2) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body. In the application/vnd.3gpp.mcvideo-info+xml MIME body, the MCVideo client shall include the <mcvideo-request-uri> element set to the MCVideo ID of the MCVideo user;
- 3) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Preferred-Service header field according to IETF RFC 6050 [14];
- 4) shall set the Event header field to the 'poc-settings' value;
- 5) shall include an Accept header field containing the "application/poc-settings+xml" MIME type;
- 6) if the MCVideo client wants to receive the current status and later notification, shall set the Expires header field according to IETF RFC 6665 [16], to 4294967295; and

NOTE 1: 4294967295, which is equal to $2^{32}-1$, is the highest value defined for Expires header field in IETF RFC 3261 [15].

- 7) if the MCVideo client wants to fetch the current state only, shall set the Expires header field according to IETF RFC 6665 [16], to zero.

In order to re-subscribe or de-subscribe, the MCVideo client shall generate an in-dialog SIP SUBSCRIBE request according to 3GPP TS 24.229 [11], IETF RFC 6665 [16], IETF RFC 4354 [53]. In the SIP SUBSCRIBE request, the MCVideo client:

- 1) shall set the Event header field to the 'poc-settings' value;
- 2) shall include an Accept header field containing the "application/poc-settings+xml" MIME type;
- 3) if the MCVideo client wants to receive the current status and later notification, shall set the Expires header field according to IETF RFC 6665 [16], to 4294967295; and

NOTE 2: 4294967295, which is equal to $2^{32}-1$, is the highest value defined for Expires header field in IETF RFC 3261 [15].

- 4) if the MCVideo client wants to de-subscribe, shall set the Expires header field according to IETF RFC 6665 [16], to zero.

Upon receiving a SIP NOTIFY request according to 3GPP TS 24.229 [11], IETF RFC 6665 [16] and IETF RFC 4354 [53], that contains an application/poc-settings+xml MIME body the MCVideo client shall cache:

- 1) the <am-settings> element of the poc-settings+xml MIME body for each MCVideo client identified by the "id" attribute according to IETF RFC 4354 [53] as the current Answer-mode indication of that MPCTT client; and
- 2) the <selected-user-profile-index> element of the poc-settings+xml MIME body for each MCVideo client identified by the "id" attribute according to IETF RFC 4354 [53] as the active MCVideo user profile of that MCVideo client.

7.3 MCVideo server procedures

7.3.1 General

The MCVideo server obtains information that it needs to implement service authorization specific requirements from:

- a) any received third-party SIP REGISTER request (e.g. including information contained in the body of the third-party SIP REGISTER request) as specified in 3GPP TS 24.229 [11]. The body will carry the SIP REGISTER request as sent by the MCVideo client, containing information needed for service authorization; or
- b) any received SIP PUBLISH request for MCVideo server settings containing the g.3gpp.mcvideo media feature tag along with the "require" and "explicit" header field parameters. The body of the SIP PUBLISH request will contain information needed for service authorization.

7.3.1A Confidentiality and Integrity Protection

When the MCVideo server receives a SIP REGISTER request sent from the MCVideo client contained within a message/sip MIME body of a received third-party SIP REGISTER request or a SIP PUBLISH request, it first determines whether XML MIME bodies included in the request are integrity protected. If XML MIME bodies are integrity protected the MCVideo server validates the signature of each of the XML MIME bodies. If the integrity protection check(s) pass or the XML MIME bodies are not integrity protected, the MCVideo server then determines whether the content in specific XML elements is confidentiality protected. If XML content is confidentiality protected, the MCVideo server decrypts the protected content.

Upon receiving:

- a SIP REGISTER request containing an application/vnd.3gpp.mcvideo-info+xml MIME body within a message/sip MIME body of the SIP REGISTER request sent from the MCVideo client; or
- a SIP PUBLISH request containing an application/vnd.3gpp.mcvideo-info+xml MIME body and an application/poc-settings+xml MIME body;

the MCVideo server:

- 1) shall determine if integrity protection has been applied to XML MIME bodies in the SIP request by following the procedures in subclause 6.6.3.4.1 for each XML MIME body;
- 2) if integrity protection has been applied, shall use the keying data described in subclause 6.6.3.2 and the procedures described in subclause 6.6.3.4.2 to verify the integrity of each of the XML MIME bodies; and
- 3) if all integrity protection checks succeed, shall continue with the remaining steps of this subclause.

Upon receiving:

- a SIP REGISTER request containing an application/vnd.3gpp.mcvideo-info+xml MIME body with an <mcvideo-access-token> element and an <mcvideo-client-id> element within a message/sip MIME body of the SIP REGISTER request sent from the MCVideo client; or
- a SIP PUBLISH request containing an application/vnd.3gpp.mcvideo-info+xml MIME body with an <mcvideo-access-token> element and an <mcvideo-client-id> element, and an application/poc-settings+xml MIME body;

the MCVideo server:

- 1) shall determine if confidentiality protection has been applied to the <mcvideo-access-token> element and the <mcvideo-client-id> element in the application/vnd.3gpp.mcvideo-info+xml MIME body, by following the procedures in subclause 6.6.2.4.1;
- 2) if confidentiality protection has been applied to the <mcvideo-access-token> element and <mcvideo-client-id> element:
 - a) shall use the keying information received in the MIKEY-SAKKE I_MESSAGE as specified in 3GPP TS 33.180 [8], along with the procedures described in subclause 6.6.2.4.2 to:
 - i) decrypt the received access token in the <mcvideo-access-token> element in the application/vnd.3gpp.mcvideo-info+xml MIME body; and
 - ii) decrypt the received MCVideo client ID in the <mcvideo-client-id> element in the application/vnd.3gpp.mcvideo-info+xml MIME body;
 - b) if the decryption procedure succeeds, shall identify the MCVideo ID and the MCVideo client ID from the decrypted values; and
 - c) if the decryption procedure fails, shall determine that confidentiality protection has not been successful;
- 3) if confidentiality protection has been applied to only one of the <mcvideo-access-token> element or the <mcvideo-client-id> element:
 - a) shall determine that confidentiality protection has not been successful;
- 4) if confidentiality protection has not been applied:
 - a) shall identify the MCVideo ID from <mcvideo-access-token> element received in the application/vnd.3gpp.mcvideo-info+xml MIME body; and
 - b) shall identify the MCVideo client ID from the <mcvideo-client-id> element received in the application/vnd.3gpp.mcvideo-info+xml MIME body.

Upon receiving a SIP PUBLISH request containing an application/vnd.3gpp.mcvideo-info+xml MIME body with an <mcvideo-request-uri> element, an <mcvideo-client-id> element, and an application/poc-settings+xml MIME body, the MCVideo server:

- 1) shall determine if confidentiality protection has been applied to the <mcvideo-request-uri> element and the <mcvideo-client-id> element in the application/vnd.3gpp.mcvideo-info+xml MIME body by following the procedures in subclause 6.6.2.4.1;
- 2) if confidentiality protection has been applied to the <mcvideo-request-uri> element and the <mcvideo-client-id> element:
 - a) shall use the keying information described in subclause 6.6.2.2 along with the procedures described in subclause 6.6.2.4.2 to:
 - i) decrypt the received encrypted MCVideo ID in the <mcvideo-request-uri> element in the application/vnd.3gpp.mcvideo-info+xml MIME body; and
 - ii) decrypt the received encrypted MCVideo client ID in the <mcvideo-client-id> element in the application/vnd.3gpp.mcvideo-info+xml MIME body;
 - b) if all decryption procedures succeed, shall identify the MCVideo ID and MCVideo client ID from the decrypted values; and
 - c) if the decryption procedure fails, shall determine that confidentiality protection has not been successful;
- 3) if confidentiality protection has been applied to only one of the <mcvideo-request-uri> element or <mcvideo-client-id> element:
 - a) shall determine that confidentiality protection has not been successful;
- 4) if confidentiality protection has not been applied:

- a) shall identify the MCVideo ID from the contents of the <mcvideo-request-uri> element in the application/vnd.3gpp.mcvideo-info+xml MIME body;and
- b) shall identify the MCVideo client ID from the <mcvideo-client-id> element received in the application/vnd.3gpp.mcvideo-info+xml MIME body.

7.3.2 SIP REGISTER request for service authorisation

The MCVideo server shall support obtaining service authorization specific information from the SIP REGISTER request sent from the MCVideo client and included in the body of a third-party SIP REGISTER request.

NOTE 1: 3GPP TS 24.229 [11] defines how based on initial filter criteria the SIP REGISTER request sent from the UE is included in the body of the third-party SIP REGISTER request.

Upon receiving a third party SIP REGISTER request with a message/sip MIME body containing the SIP REGISTER request sent from the MCVideo client, the MCVideo server:

- 1) shall identify the IMS public user identity from the third-party SIP REGISTER request;
- 2) shall identify the MCVideo ID from the SIP REGISTER request sent from the MCVideo client and included in the message/sip MIME body of the third-party SIP REGISTER request by following the procedures in subclause 7.3.1A;

3) shall perform service authorization for the identified MCVideo ID as described in 3GPP TS 33.180 [8];

4) if service authorization was successful, shall bind the MCVideo ID to the IMS public user identity; and

NOTE 2: The MCVideo server will store the binding MCVideo ID, IMS public user identity and an identifier addressing the MCVideo server in an external database.

- 5) if service authorization was not successful, shall send a SIP 403 (Forbidden) response towards the MCVideo server with the warning text set to: "101 service authorisation failed" in a Warning header field as specified in subclause 4.4.

7.3.3 SIP PUBLISH request for service authorisation and service settings

The MCVideo server shall support obtaining service authorization specific information from a SIP PUBLISH request for MCVideo server settings.

Upon receiving a SIP PUBLISH request containing:

- 1) an Event header field set to the "poc-settings" value;
- 2) an application/poc-settings+xml MIME body; and
- 3) an application/vnd.3gpp.mcvideo-info+xml MIME body containing an <mcvideo-access-token> element and an <mcvideo-client-id> element;

the MCVideo server:

1) shall identify the IMS public user identity from the P-Asserted-Identity header field;

2) shall perform the procedures in subclause 7.3.1A;

3) if the procedures in subclause 7.3.1A were not successful shall send a SIP 403 (Forbidden) response towards the MCVideo server with the warning text set to: "140 unable to decrypt XML content " in a Warning header field as specified in subclause 4.4, and not continue with the rest of the steps in this subclause;

4) shall perform service authorization for the identified MCVideo ID as described in 3GPP TS 33.180 [8];

5) if service authorization was successful shall bind the MCVideo ID to the IMS public user identity;

NOTE 1: The MCVideo server will store the binding MCVideo ID, IMS public user identity and an identifier addressing the MCVideo server in an external database.

- 6) if service authorization was not successful, shall send a SIP 403 (Forbidden) response towards the MCVideo server with the warning text set to: "101 service authorisation failed" in a Warning header field as specified in subclause 4.4, and not continue with the rest of the steps in this subclause;
- 7) shall process the SIP PUBLISH request according to rules and procedures of IETF RFC 3903 [12] and if processing of the SIP request was not successful, do not continue with the rest of the steps;
- 8) shall cache the received MCVideo service settings until the MCVideo service settings expiration timer expires;
- 9) shall send a SIP 200 (OK) response according 3GPP TS 24.229 [11];
- 10) shall use the Answer-Mode Indication setting in the <am-settings> element of the poc-settings event package as the current Answer-Mode Indication of the MCVideo client.
- 11) shall download the MCVideo user profile from the MCVideo user database as defined in 3GPP TS 29.283 [54] if not already stored at the MCVideo server and use the <selected-user-profile-index> element of the poc-settings event package if included to identify the active MCVideo user profile for the MCVideo client;

NOTE 2: If the <selected-user-profile-index> element of the poc-settings event package is included then only that MCVideo user profile is needed to be downloaded from the MCVideo user database.

- 12) if there is no <selected-user-profile-index> element included in the poc-settings event package then if multiple MCVideo user profiles are stored at the MCVideo server or downloaded for the MCVideo user from the MCVideo user database, shall determine the pre-selected MCVideo user profile to be used as the active MCVideo user profile by identifying the MCVideo user profile (see the MCVideo user profile document in 3GPP TS 24.484 [25]) in the collection of MCVideo user profiles that contains a <Pre-selected-indication> element; and

NOTE 3: If only one MCVideo user profile is stored at the MCVideo server or only one MCVideo user profile is downloaded from the MCVideo user database, then by default this MCVideo user profile is the pre-selected MCVideo user profile.

- 13) if an <ImplicitAffiliations> element is contained in the <OnNetwork> element of the MCVideo user profile document with one or more <entry> elements containing an MCVideo group ID (see the MCVideo user profile document in 3GPP TS 24.484 [25]) for the served MCVideo ID, shall perform implicit affiliation as specified in subclause 8.2.2.2.15

7.3.4 Receiving SIP PUBLISH request for MCVideo service settings only

Upon receiving a SIP PUBLISH request containing:

- 1) an Event header field set to the "poc-settings" value;
- 2) an application/poc-settings+xml MIME body; and
- 3) an application/vnd.3gpp.mcvideo-info+xml MIME body containing an <mcvideo-request-uri> element and an <mcvideo-client-id> element;

The MCVideo server:

- 1) shall identify the IMS public user identity from the P-Asserted-Identity header field;
- 2) shall perform the procedures in subclause 7.3.1A;
- 3) if the procedures in subclause 7.3.1A were not successful, shall send a SIP 403 (Forbidden) response towards the MCVideo server with the warning text set to: "140 unable to decrypt XML content" in a Warning header field as specified in subclause 4.4, and not continue with the rest of the steps in this subclause;
- 4) shall verify that a binding between the IMS public user identity in the Request-URI and the MCVideo ID in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml exists at the MCVideo server;
- 5) if a binding exists between the IMS public user identity and the MCVideo ID in the request and the validity period of the binding has not expired shall download the MCVideo user profile from the MCVideo user database as defined in 3GPP TS 29.283 [54] if not already stored at the MCVideo server;

- 6) if a binding does not exist between the IMS public user identity and the MCVideo ID in the request or the binding exists, but the validity period of the binding has expired, shall reject the SIP PUBLISH request with a SIP 404 (Not Found) response and not continue with any of the remaining steps;
- 7) shall process the SIP PUBLISH request according to rules and procedures of IETF RFC 3903 [12] and if processing of the SIP request was not successful, do not continue with the rest of the steps;
- 8) shall cache the received MCVideo service settings until the MCVideo service settings expiration timer expires;
- 9) shall send a SIP 200 (OK) response according 3GPP TS 24.229 [11];
- 10) shall use the Answer-Mode Indication setting in the <am-settings> element of the poc-settings event package as the current Answer-Mode Indication of the MCVideo client.
- 11) shall download the MCVideo user profile from the MCVideo user database as defined in 3GPP TS 29.283 [54] if not already stored at the MCVideo server and use the <selected-user-profile-index> element of the poc-settings event package if included to identify the active MCVideo user profile for the MCVideo client;

NOTE 1: If the <selected-user-profile-index> element of the poc-settings event package is included then only that MCVideo user profile is needed to be downloaded from the MCVideo user database.

- 12) if there is no <selected-user-profile-index> element included in the poc-settings event package then if multiple MCVideo user profiles are stored at the MCVideo server or downloaded for the MCVideo user from the MCVideo user database, shall determine the pre-selected MCVideo user profile to be used as the active MCVideo user profile by identifying the MCVideo user profile (see the MCVideo user profile document in 3GPP TS 24.484 [25]) in the collection of MCVideo user profiles that contains a <Pre-selected-indication> element; and

NOTE 2: If only one MCVideo user profile is stored at the MCVideo server or only one MCVideo user profile is downloaded from the MCVideo user database, then by default this MCVideo user profile is the pre-selected MCVideo user profile.

- 13) if an <ImplicitAffiliations> element is contained in the <OnNetwork> element of the MCVideo user profile document with one or more <entry> elements containing an MCVideo group ID (see the MCVideo user profile document in 3GPP TS 24.484 [25]) for the served MCVideo ID, shall perform implicit affiliation as specified in subclause 8.2.2.2.15.

7.3.5 Receiving SIP PUBLISH request with "Expires=0"

Upon receiving a SIP PUBLISH request containing:

- 1) an Event header field set to the "poc-settings" value; and
- 2) an Expires header field set to 0;

the MCVideo server:

- 1) shall identify the IMS public user identity from the P-Asserted-Identity header field;
- 2) shall process the SIP PUBLISH request according to rules and procedures of IETF RFC 3903 [12] and if processing of the SIP request was successful, continue with the rest of the steps;
- 3) shall remove the MCVideo service settings;
- 4) shall remove the binding between the MCVideo ID and public user identity; and
- 5) shall send a SIP 200 (OK) response according to 3GPP TS 24.229 [11].

7.3.6 Subscription to and notification of MCVideo service settings

7.3.6.1 Receiving subscription to MCVideo service settings

Upon receiving a SIP SUBSCRIBE request such that:

- 1) Request-URI of the SIP SUBSCRIBE request contains the public service identity identifying the participating MCVideo function of the served MCVideo user;
- 2) the SIP SUBSCRIBE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body containing the <mcvideo-request-uri> element which identifies an MCVideo ID served by the MCVideo server;
- 3) the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Asserted-Service header field according to IETF RFC 6050 [14]; and
- 3) the Event header field of the SIP SUBSCRIBE request contains the 'poc-settings' event type.

the MCVideo server:

- 1) shall identify the served MCVideo ID in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP SUBSCRIBE request;
- 2) if the Request-URI of the SIP SUBSCRIBE request contains the public service identity identifying the participating MCVideo function serving the MCVideo user, shall identify the originating MCVideo ID from public user identity in the P-Asserted-Identity header field of the SIP SUBSCRIBE request;
- 3) if the originating MCVideo ID is different than the served MCVideo ID, shall send a 403 (Forbidden) response and shall not continue with the rest of the steps; and
- 4) shall generate a 200 (OK) response to the SIP SUBSCRIBE request according to 3GPP TS 24.229 [11], IETF RFC 6665 [16] and IETF RFC 4354 [53].

For the duration of the subscription, the MCVideo server shall notify subscriber about changes of the MCVideo service settings of the subscribed MCVideo user, as described in subclause 7.3.6.2.

7.3.6.2 Sending notification of change of MCVideo service settings

In order to notify the subscriber about changes of the MCVideo service settings of the subscribed MCVideo client of the subscribed MCVideo user, the MCVideo server:

- 1) shall generate an application/poc-settings+xml MIME body as defined in 3GPP TS 24.379 [51] containing:
 - a) the <am-settings> element of the poc-settings event package set to the current answer mode setting of the MCVideo client according to IETF RFC 4354 [53]; and
 - b) the <selected-user-profile-index> element identifying the active MCVideo user profile; and
- 2) send a SIP NOTIFY request according to 3GPP TS 24.229 [11], IETF RFC 6665 [16] and IETF RFC 4354 [53] with the constructed application/poc-settings+xml MIME body.

8 Affiliation

8.1 General

Subclause 8.2 contains the procedures for explicit affiliation at the MCVideo client, the MCVideo server serving the MCVideo user and the MCVideo server owning the MCVideo group.

Subclause 8.2 contains the procedures for implicit affiliation at the MCVideo server serving the MCVideo user and the MCVideo server owning the MCVideo group.

Subclause 8.3 describes the coding used for explicit affiliation.

The procedures for implicit affiliation in this clause are triggered at the MCVideo server serving the MCVideo user in the following circumstances:

- on receipt of a SIP INVITE request or a SIP REFER request from an MCVideo client to join an MCVideo chat group, where the MCVideo client is not already affiliated to the MCVideo group;
- on receipt of a SIP INVITE request or a SIP REFER request from an MCVideo client when attempting to initiate an MCVideo emergency group call or MCVideo imminent peril group call and the MCVideo client is not already affiliated to the MCVideo group;
- on receipt of a SIP MESSAGE request from an MCVideo client when initiating an MCVideo emergency alert targeted to an MCVideo group and the MCVideo client is not already affiliated to the MCVideo group; and
- on receipt of a SIP REGISTER request for service authorisation or SIP PUBLISH request for service authorisation and service settings, as determined by configuration in the MCVideo user profile document.

Editor's Note: when service authorization procedures are described in this specification, the above bullet should refer to the relevant subclause. MCVideo user profile document is expected to be defined in 24.484. A reference to this specification needs to be added here.

The procedures for implicit affiliation in this clause are triggered at the MCVideo server owning the MCVideo group in the following circumstances:

- on receipt of a SIP INVITE request from the MCVideo server serving the MCVideo user where an MCVideo user wants to join an MCVideo chat group and the MCVideo client is not already affiliated to the MCVideo group;
- on receipt of a SIP INVITE request from the MCVideo server serving the MCVideo user where an MCVideo user initiates an MCVideo emergency group call or MCVideo imminent peril group call and the MCVideo client is not already affiliated to the MCVideo group; and
- on receipt of a SIP MESSAGE request from the MCVideo server serving the MCVideo user when the MCVideo user initiates an MCVideo emergency alert targeted to an MCVideo group and the MCVideo client is not already affiliated to the MCVideo group.

8.2 Procedures

8.2.1 MCVideo client procedures

8.2.1.1 General

The MCVideo client procedures consist of:

- an affiliation status change procedure;
- an affiliation status determination procedure;
- a procedure for sending affiliation status change request in negotiated mode to target MCVideo user; and
- a procedure for receiving affiliation status change request in negotiated mode from authorized MCVideo user.

In order to obtain information about success or rejection of changes triggered by the affiliation status change procedure for an MCVideo user, the MCVideo client needs to initiate the affiliation status determination procedure for the MCVideo user before starting the affiliation status change procedure for the MCVideo user.

8.2.1.2 Affiliation status change procedure

In order:

- to indicate that an MCVideo user is interested in one or more MCVideo group(s) at an MCVideo client;
- to indicate that the MCVideo user is no longer interested in one or more MCVideo group(s) at the MCVideo client;

- to refresh indication of an MCVideo user interest in one or more MCVideo group(s) at an MCVideo client due to near expiration of the expiration time of an MCVideo group with the affiliation status set to the "affiliated" state received in a SIP NOTIFY request in subclause 8.2.1.3;
- to send an affiliation status change request in mandatory mode to another MCVideo user; or
- any combination of the above;

the MCVideo client shall generate a SIP PUBLISH request according to 3GPP TS 24.229 [11], IETF RFC 3903 [12], and IETF RFC 3856 [13].

In the SIP PUBLISH request, the MCVideo client:

- 1) shall set the Request-URI to the public service identity identifying the originating participating MCVideo function serving the MCVideo user;
- 2) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body. In the application/vnd.3gpp.mcvideo-info+xml MIME body, the MCVideo client shall include the <mcvideo-request-uri> element set to the MCVideo ID of the MCVideo user;

Editor's Note: the application/vnd.3gpp.mcvideo-info+xml MIME body needs to be defined in 24.281.

- 3) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Preferred-Service header field according to IETF RFC 6050 [14];
- 4) if the targeted MCVideo user is interested in at least one MCVideo group at the targeted MCVideo client, shall set the Expires header field according to IETF RFC 3903 [12], to 4294967295;

NOTE 1: 4294967295, which is equal to $2^{32}-1$, is the highest value defined for Expires header field in IETF RFC 3261 [15].

- 5) if the targeted MCVideo user is no longer interested in any MCVideo group at the targeted MCVideo client, shall set the Expires header field according to IETF RFC 3903 [12], to zero; and
- 6) shall include an application/pdf+xml MIME body indicating per-user affiliation information according to subclause 8.3.1. In the MIME body, the MCVideo client:
 - a) shall include all MCVideo groups where the targeted MCVideo user indicates its interest at the targeted MCVideo client;
 - b) shall include the MCVideo client ID of the targeted MCVideo client;
 - c) shall not include the "status" attribute and the "expires" attribute in the <affiliation> element; and
 - d) shall set the <p-id> child element of the <presence> root element to a globally unique value.

The MCVideo client shall send the SIP PUBLISH request according to 3GPP TS 24.229 [11].

8.2.1.3 Affiliation status determination procedure

NOTE 1: The MCVideo UE also uses this procedure to determine which MCVideo groups the MCVideo user successfully affiliated to.

In order to discover MCVideo groups:

- 1) which the MCVideo user at an MCVideo client is affiliated to; or
- 2) which another MCVideo user is affiliated to;

the MCVideo client shall generate an initial SIP SUBSCRIBE request according to 3GPP TS 24.229 [11], IETF RFC 3856 [13], and IETF RFC 6665 [16].

In the SIP SUBSCRIBE request, the MCVideo client:

- 1) shall set the Request-URI to the public service identity identifying the originating participating MCVideo function serving the MCVideo user;

- 2) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body. In the application/vnd.3gpp.mcvideo-info+xml MIME body, the MCVideo client shall include the <mcvideo-request-uri> element set to the MCVideo ID of the targeted MCVideo user;
- 3) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Preferred-Service header field according to IETF RFC 6050 [14];
- 4) if the MCVideo client wants to receive the current status and later notification, shall set the Expires header field according to IETF RFC 6665 [16], to 4294967295;

NOTE 2: 4294967295, which is equal to $2^{32}-1$, is the highest value defined for Expires header field in IETF RFC 3261 [15].

- 5) if the MCVideo client wants to fetch the current state only, shall set the Expires header field according to IETF RFC 6665 [16], to zero; and
- 6) shall include an Accept header field containing the application/pdf+xml MIME type; and
- 7) if requesting MCVideo groups where the MCVideo user is affiliated to at the MCVideo client, shall include an application/simple-filter+xml MIME body indicating per client restrictions of presence event package notification information according to subclause 8.3.2.

In order to re-subscribe or de-subscribe, the MCVideo client shall generate an in-dialog SIP SUBSCRIBE request according to 3GPP TS 24.229 [11], IETF RFC 3856 [13], and IETF RFC 6665 [16]. In the SIP SUBSCRIBE request, the MCVideo client:

- 1) if the MCVideo client wants to receive the current status and later notification, shall set the Expires header field according to IETF RFC 6665 [16], to 4294967295;

NOTE 3: 4294967295, which is equal to $2^{32}-1$, is the highest value defined for Expires header field in IETF RFC 3261 [15].

- 2) if the MCVideo client wants to de-subscribe, shall set the Expires header field according to IETF RFC 6665 [16], to zero; and
- 3) shall include an Accept header field containing the application/pdf+xml MIME type.

Upon receiving a SIP NOTIFY request according to 3GPP TS 24.229 [11], IETF RFC 3856 [13], and IETF RFC 6665 [16], if SIP NOTIFY request contains an application/pdf+xml MIME body indicating per-user affiliation information constructed according to subclause 8.3.1, then the MCVideo client shall determine affiliation status of the MCVideo user for each MCVideo group at the MCVideo client(s) in the MIME body. If the <p-id> child element of the <presence> root element of the application/pdf+xml MIME body of the SIP NOTIFY request is included, the <p-id> element value indicates the SIP PUBLISH request which triggered sending of the SIP NOTIFY request.

8.2.1.4 Procedure for sending affiliation status change request in negotiated mode to target MCVideo user

NOTE: Procedure for sending affiliation status change request in negotiated mode to several target MCVideo users is not supported in this version of the specification.

Upon receiving a request from the MCVideo user to send an affiliation status change request in negotiated mode to a target MCVideo user, the MCVideo client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [11] and IETF RFC 3428 [17]. In the SIP MESSAGE request, the MCVideo client:

- 1) shall set the Request-URI to the public service identity identifying the originating participating MCVideo function serving the MCVideo user;
- 2) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body. In the application/vnd.3gpp.mcvideo-info+xml MIME body, the MCVideo client shall include the <mcvideo-request-uri> element set to the MCVideo ID of the target MCVideo user;
- 3) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Preferred-Service header field according to IETF RFC 6050 [14] in the SIP MESSAGE request;

- 4) shall include an application/vnd.3gpp.mcvideo-affiliation-command+xml MIME body as specified in Annex F.4; and
- 5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [11].

On receiving a SIP 2xx response to the SIP MESSAGE request, the MCVideo client shall indicate to the user that the request has been delivered to an MCVideo client of the target MCVideo user.

8.2.1.5 Procedure for receiving affiliation status change request in negotiated mode from authorized MCVideo user

Upon receiving a SIP MESSAGE request containing:

- 1) the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Asserted-Service header field according to IETF RFC 6050 [14]; and
- 2) an application/vnd.3gpp.mcvideo-affiliation-command+xml MIME body with a list of MCVideo groups for affiliation under the <affiliate> element and a list of MCVideo groups for de-affiliation under the <de-affiliate> element;

then the MCVideo client:

- 1) shall send a 200 (OK) response to the SIP MESSAGE request;
- 2) shall seek confirmation of the list of MCVideo groups for affiliation and the list of MCVideo groups for de-affiliation, resulting in an accepted list of MCVideo groups for affiliation and an accepted list of MCVideo groups for de-affiliation; and
- 3) if the user accepts the request:
 - a) shall perform affiliation for each entry in the accepted list of MCVideo groups for affiliation for which the MCVideo client is not affiliated, as specified in subclause 8.2.1.2; and
 - b) shall perform de-affiliation for each entry in the accepted list of MCVideo groups for de-affiliation for which the MCVideo client is affiliated, as specified in subclause 8.2.1.2.

8.2.2 MCVideo server procedures

8.2.2.1 General

The MCVideo server procedures consist of:

- procedures of MCVideo server serving the MCVideo user; and
- procedures of MCVideo server owning the MCVideo group.

8.2.2.2 Procedures of MCVideo server serving the MCVideo user

8.2.2.2.1 General

The procedures of MCVideo server serving the MCVideo user consist of:

- a receiving affiliation status change from MCVideo client procedure;
- a receiving subscription to affiliation status procedure;
- a sending notification of change of affiliation status procedure;
- a sending affiliation status change towards MCVideo server owning MCVideo group procedure;
- an affiliation status determination from MCVideo server owning MCVideo group procedure;
- a procedure for authorizing affiliation status change request in negotiated mode sent to served MCVideo user;

- a forwarding affiliation status change towards another MCVideo user procedure;
- a forwarding subscription to affiliation status towards another MCVideo user procedure
- an affiliation status determination procedure;
- an affiliation status change by implicit affiliation procedure;
- an implicit affiliation status change completion procedure;
- an implicit affiliation status change cancellation procedure; and
- an implicit affiliation to configured groups procedure.

8.2.2.2.2 Stored information

The MCVideo server shall maintain a list of MCVideo user information entries. The list of the MCVideo user information entries contains one MCVideo user information entry for each served MCVideo ID.

In each MCVideo user information entry, the MCVideo server shall maintain:

- 1) an MCVideo ID. This field uniquely identifies the MCVideo user information entry in the list of the MCVideo user information entries; and
- 2) a list of MCVideo client information entries.

In each MCVideo client information entry, the MCVideo server shall maintain:

- 1) an MCVideo client ID. This field uniquely identifies the MCVideo client information entry in the list of the MCVideo client information entries; and
- 2) a list of MCVideo group information entries.

In each MCVideo group information, the MCVideo server shall maintain:

- 1) an MCVideo group ID. This field uniquely identifies the MCVideo group information entry in the list of the MCVideo group information entries;
- 2) an affiliation status;
- 3) an expiration time;
- 4) an affiliating p-id; and
- 5) a next publishing time.

8.2.2.2.3 Receiving affiliation status change from MCVideo client procedure

Upon receiving a SIP PUBLISH request such that:

- 1) Request-URI of the SIP PUBLISH request contains either the public service identity identifying the originating participating MCVideo function serving the MCVideo user, or the public service identity identifying the terminating participating MCVideo function serving the MCVideo user;
- 2) the SIP PUBLISH request contains an application/vnd.3gpp.mcvideo-info+xml MIME body containing the <mcvideo-request-uri> element which identifies an MCVideo ID served by the MCVideo server;
- 3) the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Asserted-Service header field according to IETF RFC 6050 [14];
- 4) the Event header field of the SIP PUBLISH request contains the "presence" event type; and
- 5) SIP PUBLISH request contains an application/pidf+xml MIME body indicating per-user affiliation information according to subclause 8.3.1;

then the MCVideo server:

- 1) shall identify the served MCVideo ID in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP PUBLISH request;
- 2) if the Request-URI of the SIP PUBLISH request contains the public service identity identifying the originating participating MCVideo function serving the MCVideo user, shall identify the originating MCVideo ID from public user identity in the P-Asserted-Identity header field of the SIP PUBLISH request;
- 3) if the Request-URI of the SIP PUBLISH request contains the public service identity identifying the terminating participating MCVideo function serving the MCVideo user, shall identify the originating MCVideo ID in the <mcvideo-calling-user-identity> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP PUBLISH request;
- 4) if the originating MCVideo ID is different than the served MCVideo ID and the originating MCVideo ID is not authorized to modify affiliation status of the served MCVideo ID, shall send a 403 (Forbidden) response and shall not continue with the rest of the steps;
- 5) if the Expires header field of the SIP PUBLISH request is not included or has nonzero value lower than 4294967295, shall send a SIP 423 (Interval Too Brief) response to the SIP PUBLISH request, where the SIP 423 (Interval Too Brief) response contains a Min-Expires header field set to 4294967295, and shall not continue with the rest of the steps;
- 6) if the Expires header field of the SIP PUBLISH request has nonzero value, shall determine the candidate expiration interval to according to IETF RFC 3903 [12];
- 7) if the Expires header field of the SIP PUBLISH request has zero value, shall set the candidate expiration interval to zero;
- 8) shall respond with SIP 200 (OK) response to the SIP PUBLISH request according to 3GPP TS 24.229 [11], IETF RFC 3903 [12]. In the SIP 200 (OK) response, the MCVideo server:
 - a) shall set the Expires header field according to IETF RFC 3903 [12], to the candidate expiration time;
- 9) if the "entity" attribute of the <presence> element of the application/pidf+xml MIME body of the SIP PUBLISH request is different than the served MCVideo ID, shall not continue with the rest of the steps;
- 10) shall identify the served MCVideo client ID in the "id" attribute of the <tuple> element of the <presence> element of the application/pidf+xml MIME body of the SIP PUBLISH request;
- 11) shall consider an MCVideo user information entry such that:
 - a) the MCVideo user information entry is in the list of MCVideo user information entries described in subclause 8.2.2.2.2; and
 - b) the MCVideo ID of the MCVideo user information entry is equal to the served MCVideo ID;as the served MCVideo user information entry;
- 12) shall consider an MCVideo client information entry such that:
 - a) the MCVideo client information entry is in the list of MCVideo client information entries of the served MCVideo user information entry; and
 - b) the MCVideo client ID of the MCVideo client information entry is equal to the served MCVideo client ID;as the served MCVideo client information entry;
- 13) shall consider a copy of the list of the MCVideo group information entries of the served MCVideo client information entry as the served list of the MCVideo group information entries;
- 14) if the candidate expiration interval is nonzero:
 - a) shall construct the candidate list of the MCVideo group information entries as follows:
 - i) for each MCVideo group ID which has an MCVideo group information entry in the served list of the MCVideo group information entries, such that the expiration time of the MCVideo group information entry has not expired yet, and which is indicated in a "group" attribute of an <affiliation> element of the

<status> element of the <tuple> element of the <presence> root element of the application/pidf+xml MIME body of the SIP PUBLISH request:

- A) shall copy the MCVideo group information entry into a new MCVideo group information entry of the candidate list of the MCVideo group information entries;
 - B) if the affiliation status of the MCVideo group information entry is "deaffiliating" or "deaffiliated", shall set the affiliation status of the new MCVideo group information entry to the "affiliating" state and shall reset the affiliating p-id of the new MCVideo group information entry; and
 - C) shall set the expiration time of the new MCVideo group information entry to the current time increased with the candidate expiration interval;
- ii) for each MCVideo group ID which has an MCVideo group information entry in the served list of the MCVideo group information entries, such that the expiration time of the MCVideo group information entry has not expired yet, and which is not indicated in any "group" attribute of the <affiliation> element of the <status> element of the <tuple> element of the <presence> root element of the application/pidf+xml MIME body of the SIP PUBLISH request:
- A) shall copy the MCVideo group information entry into a new MCVideo group information entry of the candidate list of the MCVideo group information entries; and
 - B) if the affiliation status of the MCVideo group information entry is "affiliated" or "affiliating":
 - shall set the affiliation status of the new MCVideo group information entry to the "de-affiliating" state; and
 - shall set the expiration time of the new MCVideo group information entry to the current time increased with twice the value of timer F; and
- iii) for each MCVideo group ID:
- A) which does not have an MCVideo group information entry in the served list of the MCVideo group information entries; or
 - B) which has an MCVideo group information entry in the served list of the MCVideo group information entries, such that the expiration time of the MCVideo group information entry has already expired; and which is indicated in a "group" element of the <affiliation> element of the <status> element of the <tuple> element of the <presence> root element of the application/pidf+xml MIME body of the SIP PUBLISH request:
 - A) shall add a new MCVideo group information entry in the candidate list of the MCVideo group information list for the MCVideo group ID;
 - B) shall set the affiliation status of the new MCVideo group information entry to the "affiliating" state;
 - C) shall set the expiration time of the new MCVideo group information entry to the current time increased with the candidate expiration interval; and
 - D) shall reset the affiliating p-id of the new MCVideo group information entry;
- b) determine the candidate number of MCVideo group IDs as number of different MCVideo group IDs which have an MCVideo group information entry:
- i) in the candidate list of the MCVideo group information entries; or
 - ii) in the list of the MCVideo group information entries of an MCVideo client information entry such that:
 - A) the MCVideo client information entry is in the list of the MCVideo client information entries of the served MCVideo user information entry; and
 - B) the MCVideo client ID of the MCVideo client information entry is not equal to the served MCVideo client ID;

with the affiliation status set to the "affiliating" state or the "affiliated" state and with the expiration time which has not expired yet; and

- c) if the candidate number of MCVideo group IDs is bigger than N2 value of the served MCVideo ID, shall based on MCVideo service provider policy reduce the candidate MCVideo group IDs to that equal to N2;

NOTE: The MCVideo service provider policy can determine to remove an MCVideo group ID based on the order it appeared in the PUBLISH request or based on the importance or priority of the MCVideo group or some other policy to determine which MCVideo groups are preferred.

15) if the candidate expiration interval is zero, constructs the candidate list of the MCVideo group information entries as follows:

- a) for each MCVideo group ID which has an entry in the served list of the MCVideo group information entries:
 - i) shall copy the MCVideo group entry of the served list of the MCVideo group information into a new MCVideo group information entry of the candidate list of the MCVideo group information entries;
 - ii) shall set the affiliation status of the new MCVideo group information entry to the "de-affiliating" state; and
 - iii) shall set the expiration time of the new MCVideo group information entry to the current time increased with twice the value of timer F;

16) shall replace the list of the MCVideo group information entries stored in the served MCVideo client information entry with the candidate list of the MCVideo group information entries;

17) shall perform the procedures specified in subclause 8.2.2.2.6 for the served MCVideo ID and each MCVideo group ID:

- a) which does not have an MCVideo group information entry in the served list of the MCVideo group information entries and which has an MCVideo group information entry in the candidate list of the MCVideo group information entries with the affiliation status set to the "affiliating" state;
- b) which has an MCVideo group information entry in the served list of the MCVideo group information entries with the expiration time already expired, and which has an MCVideo group information entry in the candidate list of the MCVideo group information entries with the affiliation status set to the "affiliating" state;
- c) which has an MCVideo group information entry in the served list of the MCVideo group information entries with the affiliation status set to the "deaffiliating" state or the "deaffiliated" state and with the expiration time not expired yet, and which has an MCVideo group information entry in the candidate list of the MCVideo group information entries with the affiliation status set to the "affiliating" state; or
- d) which has an MCVideo group information entry in the served list of the MCVideo group information entries with the affiliation status set to the "affiliated" state and with the expiration time not expired yet, and which has an MCVideo group information entry in the candidate list of the MCVideo group information entries with the affiliation status set to the "de-affiliating" state;

18) shall identify the handled p-id in the <p-id> child element of the <presence> root element of the application/pidf+xml MIME body of the SIP PUBLISH request; and

19) shall perform the procedures specified in subclause 8.2.2.2.5 for the served MCVideo ID.

8.2.2.2.4 Receiving subscription to affiliation status procedure

Upon receiving a SIP SUBSCRIBE request such that:

- 1) Request-URI of the SIP SUBSCRIBE request contains either the public service identity identifying the originating participating MCVideo function serving the MCVideo user, or the public service identity identifying the terminating participating MCVideo function serving the MCVideo user;
- 2) the SIP SUBSCRIBE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body containing the <mcvideo-request-uri> element which identifies an MCVideo ID served by the MCVideo server;

- 3) the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Asserted-Service header field according to IETF RFC 6050 [14]; and
- 4) the Event header field of the SIP SUBSCRIBE request contains the "presence" event type;

the MCVideo server:

- 1) shall identify the served MCVideo ID in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP PUBLISH request;
- 2) if the Request-URI of the SIP SUBSCRIBE request contains the public service identity identifying the originating participating MCVideo function serving the MCVideo user, shall identify the originating MCVideo ID from public user identity in the P-Asserted-Identity header field of the SIP SUBSCRIBE request;
- 3) if the Request-URI of the SIP SUBSCRIBE request contains the public service identity identifying the terminating participating MCVideo function serving the MCVideo user, shall identify the originating MCVideo ID in the <mcvideo-calling-user-identity> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP SUBSCRIBE request;
- 4) if the originating MCVideo ID is different than the served MCVideo ID and the originating MCVideo ID is not authorized to modify affiliation status of the served MCVideo ID, shall send a 403 (Forbidden) response and shall not continue with the rest of the steps; and
- 5) shall generate a 200 (OK) response to the SIP SUBSCRIBE request according to 3GPP TS 24.229 [11], IETF RFC 6665 [16].

For the duration of the subscription, the MCVideo server shall notify the subscriber about changes of the information of the served MCVideo ID, as described in subclause 8.2.2.2.5.

8.2.2.2.5 Sending notification of change of affiliation status procedure

In order to notify the subscriber about changes of the served MCVideo ID, the MCVideo server:

- 1) shall consider an MCVideo user information entry such that:
 - a) the MCVideo user information entry is in the list of MCVideo user information entries described in subclause 8.2.2.2.2; and
 - b) the MCVideo ID of the MCVideo user information entry is equal to the served MCVideo ID; as the served MCVideo user information entry;
- 2) shall consider the list of the MCVideo client information entries of the served MCVideo user information entry as the served list of the MCVideo client information entries;
- 3) shall generate an application/pidf+xml MIME body indicating per-user affiliation information according to subclause 9.3.1 and the served list of the MCVideo client information entries with the following clarifications:
 - a) the MCVideo server shall not include information from an MCVideo group information entry with the expiration time already expired;
 - b) the MCVideo server shall not include information from an MCVideo group information entry with the affiliation status set to the "deaffiliated" state;
 - c) if the SIP SUBSCRIBE request creating the subscription of this notification contains an application/simple-filter+xml MIME body according to subclause 8.3.2, the MCVideo server shall restrict the application/pidf+xml MIME body according to the application/simple-filter+xml MIME body; and
 - d) if this procedure is invoked by procedure in subclause 8.2.2.2.3 where the handled p-id value was identified, the MCVideo server shall set the <p-id> child element of the <presentity> root element of the application/pidf+xml MIME body of the SIP NOTIFY request to the handled p-id value; and
- 4) send a SIP NOTIFY request according to 3GPP TS 24.229 [11], and IETF RFC 6665 [16] with the MIME body. In the SIP NOTIFY request, the MCVideo server shall include the generated application/pidf+xml MIME body indicating per-user affiliation information.

8.2.2.2.6 Sending affiliation status change towards MCVideo server owning MCVideo group procedure

NOTE 1: Usage of one SIP PUBLISH request to carry information about change of affiliation state of several MCVideo users served by the same MCVideo server is not supported in this version of the specification.

In order:

- to send an affiliation request of a served MCVideo ID to a handled MCVideo group ID;
- to send an de-affiliation request of a served MCVideo ID from a handled MCVideo group ID; or
- to send an affiliation request of a served MCVideo ID to a handled MCVideo group ID due to near expiration of the previously published information;

the MCVideo server shall generate a SIP PUBLISH request according to 3GPP TS 24.229 [11], IETF RFC 3903 [12] and IETF RFC 3856 [13]. In the SIP PUBLISH request, the MCVideo server:

- 1) shall set the Request-URI to the public service identity of the controlling MCVideo function associated with the handled MCVideo group ID;
- 2) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body. In the application/vnd.3gpp.mcvideo-info+xml MIME body, the MCVideo server:
 - a) shall include the <mcvideo-request-uri> element set to the handled MCVideo group ID; and
 - b) shall include the <mcvideo-calling-user-id> element set to the served MCVideo ID;
- 3) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Asserted-Service header field according to IETF RFC 6050 [14];
- 4) if sending an affiliation request, shall set the Expires header field according to IETF RFC 3903 [12], to 4294967295;

NOTE 1: 4294967295, which is equal to $2^{32}-1$, is the highest value defined for Expires header field in IETF RFC 3261 [15].

- 5) if sending an de-affiliation request, shall set the Expires header field according to IETF RFC 3903 [12], to zero;
- 6) shall include an P-Asserted-Identity header field set to the public service identity of the MCVideo server according to 3GPP TS 24.229 [11];
- 7) shall set the current p-id to a globally unique value;
- 8) shall consider an MCVideo user information entry such that:
 - a) the MCVideo user information entry is in the list of MCVideo user information entries described in subclause 8.2.2.2.2; and
 - b) the MCVideo ID of the MCVideo user information entry is equal to the served MCVideo ID; as the served MCVideo user information entry;
- 9) for each MCVideo group information entry such that:
 - a) the MCVideo group information entry has the "affiliating" affiliation status, the MCVideo group ID set to the handled MCVideo group ID, the expiration time has not expired yet and the affiliating p-id is not set;
 - b) the MCVideo group information entry is in the list of the MCVideo group information entries of an MCVideo client information entry; and
 - c) the MCVideo client information entry is in the list of the MCVideo client information entries of the served MCVideo user information entry;

shall set the affiliating p-id of the MCVideo group information entry to the current p-id; and

10) shall include an application/pidf+xml MIME body indicating per-group affiliation information constructed according to subclause 8.2.3.2. The MCVideo server shall indicate all served MCVideo client IDs, such that:

- a) the affiliation status is set to "affiliating" or "affiliated", and the expiration time has not expired yet in an MCVideo group information entry with the MCVideo group ID set to the handled MCVideo group;
- b) the MCVideo group information entry is in the list of the MCVideo group information entries of an MCVideo client information entry;
- c) the MCVideo client information entry has the MCVideo client ID set to the served MCVideo client ID; and
- d) the MCVideo client information entry is in the list of the MCVideo client information entries of the served MCVideo user information entry.

The MCVideo server shall set the <p-id> child element of the <presence> root element to the current p-id.

The MCVideo server shall not include the "expires" attribute in the <affiliation> element.

The MCVideo server shall send the SIP PUBLISH request according to 3GPP TS 24.229 [11].

If timer F expires for the SIP PUBLISH request sent for a (de)affiliation request of served MCVideo ID to the MCVideo group ID or upon receiving a SIP 3xx, 4xx, 5xx or 6xx response to the SIP PUBLISH request, the MCVideo server:

- 1) shall remove each MCVideo group ID entry such that:
 - a) the MCVideo group information entry has the MCVideo group ID set to the handled MCVideo group ID;
 - b) the MCVideo group information entry is in the list of the MCVideo group information entries of an MCVideo client information entry; and
 - c) the MCVideo client information entry is in the list of the MCVideo client information entries of the served MCVideo user information entry.

8.2.2.2.7 Affiliation status determination from MCVideo server owning MCVideo group procedure

NOTE 1: Usage of one SIP SUBSCRIBE request to subscribe for notification about change of affiliation state of several MCVideo users served by the same MCVideo server is not supported in this version of the specification.

In order to discover whether a served MCVideo user was successfully affiliated to a handled MCVideo group in the MCVideo server owning the handled MCVideo group, the MCVideo server shall generate an initial SIP SUBSCRIBE request according to 3GPP TS 24.229 [11], IETF RFC 3856 [13], and IETF RFC 6665 [16].

In the SIP SUBSCRIBE request, the MCVideo server:

- 1) shall set the Request-URI to the public service identity of the controlling MCVideo function associated with the handled MCVideo group ID;
- 2) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body. In the application/vnd.3gpp.mcvideo-info+xml MIME body, the MCVideo server:
 - a) shall include the <mcvideo-request-uri> element set to the handled MCVideo group ID; and
 - b) shall include the <mcvideo-calling-user-id> element set to the served MCVideo ID;
- 3) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Asserted-Service header field according to IETF RFC 6050 [14];
- 4) if the MCVideo server wants to receive the current status and later notification, shall set the Expires header field according to IETF RFC 6665 [16], to 4294967295;

NOTE 2: 4294967295, which is equal to $2^{32}-1$, is the highest value defined for Expires header field in IETF RFC 3261 [15].

- 5) if the MCVideo server wants to fetch the current state only, shall set the Expires header field according to IETF RFC 6665 [16], to zero; and
- 6) shall include an Accept header field containing the application/pdf+xml MIME type.

In order to re-subscribe or de-subscribe, the MCVideo server shall generate an in-dialog SIP SUBSCRIBE request according to 3GPP TS 24.229 [11], IETF RFC 3856 [13], and IETF RFC 6665 [16]. In the SIP SUBSCRIBE request, the MCVideo server:

- 1) if the MCVideo server wants to receive the current status and later notification, shall set the Expires header field according to IETF RFC 6665 [16], to 4294967295;

NOTE 3: 4294967295, which is equal to $2^{32}-1$, is the highest value defined for Expires header field in IETF RFC 3261 [15].

- 2) if the MCVideo server wants to de-subscribe, shall set the Expires header field according to IETF RFC 6665 [16], to zero; and
- 3) shall include an Accept header field containing the application/pdf+xml MIME type.

Upon receiving a SIP NOTIFY request according to 3GPP TS 24.229 [11], IETF RFC 3856 [13], and IETF RFC 6665 [16], if SIP NOTIFY request contains an application/pdf+xml MIME body indicating per-group affiliation information constructed according to subclause 8.3.1, then the MCVideo server:

- 1) for each served MCVideo ID and served MCVideo client ID such that the application/pdf+xml MIME body of SIP NOTIFY request contains:
 - a) a <tuple> element of the root <presence> element;
 - b) the "id" attribute of the <tuple> element indicating the served MCVideo ID;
 - c) an <affiliation> child element of the <status> element of the <tuple> element;
 - d) the "client" attribute of the <affiliation> element indicating the served MCVideo client ID; and
 - d) the "expires" attribute of the <affiliation> element indicating expiration of affiliation;

perform the following:

- a) if an MCVideo group information entry exists such that:
 - i) the MCVideo group information entry has the "affiliating" affiliation status, the MCVideo group ID set to the handled MCVideo group ID, and the expiration time has not expired yet;
 - ii) the MCVideo group information entry is in the list of the MCVideo group information entries of an MCVideo client information entry with the MCVideo client ID set to the served MCVideo client ID;
 - iii) the MCVideo client information entry is in the list of the MCVideo client information entries of a served MCVideo user information entry with the MCVideo ID set to the served MCVideo ID; and
 - iv) the MCVideo user information entry is in the list of MCVideo user information entries described in subclause 8.2.2.2.2; and

shall set the affiliation status of the MCVideo group information entry to "affiliated"; and

shall set the next publishing time of the MCVideo group information entry to the current time and half of the time between the current time and the expiration of affiliation; and

- 2) for each MCVideo group information entry such that:
 - a) the MCVideo group information entry has the "affiliated" affiliation status or the "deaffiliating" affiliation status, the MCVideo group ID set to the handled MCVideo group ID, and the expiration time has not expired yet;
 - b) the MCVideo group information entry is in the list of the MCVideo group information entries of an MCVideo client information entry with the MCVideo client ID set to a served MCVideo client ID;

- c) the MCVideo client information entry is in the list of the MCVideo client information entries of the served MCVideo user information entry with the MCVideo ID set to a served MCVideo ID; and
- d) the MCVideo user information entry is in the list of MCVideo user information entries described in subclause 8.2.2.2.2; and

for which the application/pidf+xml MIME body of SIP NOTIFY request does not contain:

- a) a <tuple> element of the root <presence> element;
- b) the "id" attribute of the <tuple> element indicating the served MCVideo ID;
- c) an <affiliation> child element of the <status> child element of the <tuple> element; and
- d) the "client" attribute of the <affiliation> element indicating the served MCVideo client ID.

perform the following:

- a) shall set the affiliation status of the MCVideo group information entry to "deaffiliated"; and
 - b) shall set the expiration time of the MCVideo group information entry to the current time; and
- 3) if a <p-id> element is included in the <presence> root element of the application/pidf+xml MIME body of the SIP NOTIFY request, then for each MCVideo group information entry such that:
- a) the MCVideo group information entry has the "affiliating" affiliation status, the MCVideo group ID set to the handled MCVideo group ID, the expiration time has not expired yet and with the affiliating p-id set to the value of the <p-id> element;
 - b) the MCVideo group information entry is in the list of the MCVideo group information entries of an MCVideo client information entry with the MCVideo client ID set to a served MCVideo client ID;
 - c) the MCVideo client information entry is in the list of the MCVideo client information entries of the served MCVideo user information entry with the MCVideo ID set to a served MCVideo ID; and
 - d) the MCVideo user information entry is in the list of MCVideo user information entries described in subclause 8.2.2.2.2; and

for which the application/pidf+xml MIME body of SIP NOTIFY request does not contain:

- a) a <tuple> element of the root <presence> element;
- b) the "id" attribute of the <tuple> element indicating the served MCVideo ID;
- c) an <affiliation> child element of the <status> child element of the <tuple> element; and
- d) the "client" attribute of the <affiliation> element indicating the served MCVideo client ID;

perform the following:

- a) shall set the affiliation status of the MCVideo group information entry to "deaffiliated"; and
- b) shall set the expiration time of the MCVideo group information entry to the current time.

8.2.2.2.8 Procedure for authorizing affiliation status change request in negotiated mode sent to served MCVideo user

Upon receiving a SIP MESSAGE request such that:

- 1) Request-URI of the SIP MESSAGE request contains the public service identity identifying the terminating participating MCVideo function serving the MCVideo user;
- 2) the SIP MESSAGE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body containing the <mcvideo-request-uri> element and the <mcvideo-calling-user-identity> element;
- 3) the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Asserted-Service header field according to IETF RFC 6050 [14]; and

- 4) the SIP MESSAGE request contains an application/vnd.3gpp.mcvideo-affiliation-command+xml MIME body;

then the MCVideo server:

- 1) shall identify the served MCVideo ID in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP MESSAGE request;
- 2) shall identify the originating MCVideo ID in the <mcvideo-calling-user-identity> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP MESSAGE request;
- 3) if the originating MCVideo ID is not authorized to send an affiliation status change request in negotiated mode to the served MCVideo ID, shall send a 403 (Forbidden) response and shall not continue with the rest of the steps;
- 4) shall set the Request-URI of the SIP MESSAGE request to the public user identity bound to the served MCVideo ID in the MCVideo server; and
- 5) 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.mcvideo" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [20];

before forwarding the SIP MESSAGE request further.

8.2.2.2.9 Forwarding affiliation status change towards another MCVideo user procedure

Upon receiving a SIP PUBLISH request such that:

- 1) Request-URI of the SIP PUBLISH request contains the public service identity identifying the originating participating MCVideo function serving the MCVideo user;
- 2) the SIP PUBLISH request contains an application/vnd.3gpp.mcvideo-info MIME body containing the <mcvideo-request-uri> element which identifies an MCVideo ID not served by the MCVideo server;
- 3) the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Asserted-Service header field according to IETF RFC 6050 [14];
- 4) the Event header field of the SIP PUBLISH request contains the "presence" event type; and
- 5) SIP PUBLISH request contains an application/pidf+xml MIME body indicating per-user affiliation information according to subclause 8.3.1;

then the MCVideo server:

- 1) shall identify the target MCVideo ID in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info MIME body of the SIP PUBLISH request;
- 2) shall identify the originating MCVideo ID from public user identity in the P-Asserted-Identity header field of the SIP PUBLISH request;
- 3) shall generate a SIP PUBLISH request from the received SIP PUBLISH request. In the generated SIP PUBLISH request, the MCVideo server:
 - a) shall set the Request-URI to the public service identity identifying the terminating participating MCVideo function serving the target MCVideo ID;
 - b) shall include a P-Asserted-Identity header field containing the public service identity identifying the originating participating MCVideo function serving the MCVideo user;
 - c) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body. In the application/vnd.3gpp.mcvideo-info+xml MIME body, the MCVideo server:
 - A) shall include the <mcvideo-request-uri> element set to the target MCVideo ID; and
 - B) shall include the <mcvideo-calling-user-id> element set to the originating MCVideo ID; and
 - d) shall include other signalling elements from the received SIP PUBLISH request; and

- 4) shall send the generated SIP PUBLISH request according to 3GPP TS 24.229 [11].

The MCVideo server shall forward received SIP responses to the SIP PUBLISH request.

8.2.2.2.10 Forwarding subscription to affiliation status towards another MCVideo user procedure

Upon receiving a SIP SUBSCRIBE request such that:

- 1) Request-URI of the SIP PUBLISH request contains the public service identity identifying the originating participating MCVideo function serving the MCVideo user;
- 2) the SIP PUBLISH request contains an application/vnd.3gpp.mcvideo-info MIME body containing the <mcvideo-request-uri> element which identifies an MCVideo ID not served by MCVideo server;
- 3) the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Asserted-Service header field according to IETF RFC 6050 [14]; and
- 4) the Event header field of the SIP SUBSCRIBE request contains the "presence" event type;

then the MCVideo server:

- 1) shall identify the target MCVideo ID in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info MIME body of the SIP SUBSCRIBE request;
- 2) shall identify the originating MCVideo ID from public user identity in the P-Asserted-Identity header field of the SIP SUBSCRIBE request;
- 3) shall generate a SIP SUBSCRIBE request from the received SIP SUBSCRIBE request. In the generated SIP SUBSCRIBE request, the MCVideo server:
 - a) shall set the Request-URI to the public service identity identifying the terminating participating MCVideo function serving the target MCVideo ID;
 - b) shall include a P-Asserted-Identity header field containing the public service identity identifying the originating participating MCVideo function serving the MCVideo user;
 - c) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body. In the application/vnd.3gpp.mcvideo-info+xml MIME body, the MCVideo server:
 - A) shall include the <mcvideo-request-uri> element set to the target MCVideo ID; and
 - B) shall include the <mcvideo-calling-user-id> element set to the originating MCVideo ID; and
 - d) shall include other signalling elements from the received SIP SUBSCRIBE request; and
- 4) shall send the generated SIP SUBSCRIBE request according to 3GPP TS 24.229 [11].

The MCVideo server shall forward any received SIP responses to the SIP SUBSCRIBE request, any received SIP NOTIFY request and any received SIP responses to the SIP NOTIFY request.

8.2.2.2.11 Affiliation status determination

This subclause is referenced from other procedures.

If the participating MCVideo function needs to determine the affiliation status of an MCVideo user to an MCVideo group, the participating function:

- 1) shall find the user information entry in the list of MCVideo user information entries described in subclause 9.2.2.2.2 such that the MCVideo ID of the MCVideo user information entry is equal to the MCVideo ID of the originator of the received SIP request;
 - a) if the applicable MCVideo group information entry cannot be found, then the participating MCVideo function shall determine that the MCVideo user is not affiliated to the MCVideo group at the MCVideo client and the skip the rest of the steps;

- 2) shall find the MCVideo client information entry in the list of MCVideo client information entries of MCVideo user information entry found in step 1) in which the MCVideo client ID matches the value of the <mcvideo-client-id> element contained in the application/vnd.3gpp.mcvideo-info+xml MIME body in the received SIP request;
 - a) if the applicable MCVideo client information entry cannot be found, then the participating MCVideo function shall determine that the MCVideo user is not affiliated to the MCVideo group at the MCVideo client and skip the rest of the steps;
- 3) shall find the MCVideo group information entry in the list of MCVideo group information entries of MCVideo client information entry found in step 2) such that the MCVideo group identity matches the value of the identity of the targeted MCVideo group;
 - a) if the applicable MCVideo group information entry was found in step 3) and the affiliation status of the MCVideo group information entry is "affiliating" or "affiliated", shall determine that the MCVideo user at the MCVideo client to be affiliated to the targeted MCVideo group and skip the rest of the steps;
 - b) if the applicable MCVideo group information entry was found in step 3) and the affiliation status of the MCVideo group information entry is "deaffiliating" or "deaffiliated", shall determine that the MCVideo user at the MCVideo client to not be affiliated to the targeted MCVideo group and skip the rest of the steps; or
 - c) if the applicable MCVideo group information entry was not found in step 3), shall determine that the MCVideo user at the MCVideo client is not affiliated to the targeted MCVideo group.

8.2.2.2.12 Affiliation status change by implicit affiliation

This subclause is referenced from other procedures.

Upon receiving a SIP request that requires implicit affiliation of the sending MCVideo client to an MCVideo group, the participating MCVideo function:

- 1) shall determine the served MCVideo client ID from the <mcvideo-client-id> element of the application/vnd.3gpp.mcvideo-info+xml MIME body in the received SIP request;
- 2) shall determine the MCVideo group ID from the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body in the received SIP request;
- 3) shall determine the served MCVideo ID by using the public user identity in the P-Asserted-Identity header field of the SIP request;

NOTE 1: The MCVideo ID of the calling user is bound to the public user identity at the time of service authorisation.

- 4) shall consider an MCVideo user information entry such that:
 - a) the MCVideo user information entry is in the list of MCVideo user information entries described in subclause 8.2.2.2.2; and
 - b) the MCVideo ID of the MCVideo user information entry is equal to the served MCVideo ID; as the served MCVideo user information entry;
- 5) shall consider an MCVideo client information entry such that:
 - a) the MCVideo client information entry is in the list of MCVideo client information entries of the served MCVideo user information entry; and
 - b) the MCVideo client ID of the MCVideo client information entry is equal to the served MCVideo client ID; as the served MCVideo client information entry;
- 6) shall consider a copy of the list of the MCVideo group information entries of the served MCVideo client information entry as the served list of the MCVideo group information entries;
- 7) shall construct the candidate list of the MCVideo group information entries as follows:

- a) for each MCVideo group ID which has an MCVideo group information entry in the served list of the MCVideo group information entries shall copy the MCVideo group information entry into a new MCVideo group information entry of the candidate list of the MCVideo group information entries; and
 - b) if the determined MCVideo group ID does not have an MCVideo group information entry in the served list of the MCVideo group information entries or has an MCVideo group information entry in the served list of the MCVideo group information entries, such that the expiration time of the MCVideo group information entry has already expired:
 - i) shall add a new MCVideo group information entry in the candidate list of the MCVideo group information list for the determined MCVideo group ID;
 - ii) shall set the affiliation status of the new MCVideo group information entry to the "affiliating" state; and
 - iii) shall set the expiration time of the new MCVideo group information entry to the current time increased with the candidate expiration interval;
- 8) determine the candidate number of MCVideo group IDs as the number of different MCVideo group IDs which have an MCVideo group information entry:
- a) in the candidate list of the MCVideo group information entries; or
 - b) in the list of the MCVideo group information entries of an MCVideo client information entry such that:
 - i) the MCVideo client information entry is in the list of the MCVideo client information entries of the served MCVideo user information entry; and
 - ii) the MCVideo client ID of the MCVideo client information entry is not equal to the served MCVideo client ID;
- with the affiliation status set to the "affiliating" state or the "affiliated" state and with the expiration time which has not expired yet; and
- 9) if the candidate number of MCVideo group IDs is bigger than the N2 value of the served MCVideo ID, shall based on MCVideo service provider policy reduce the candidate MCVideo group IDs to that equal to N2;
- NOTE 2: The MCVideo service provider policy can determine to remove an MCVideo group ID based on the importance or priority of other MCVideo groups, received SIP requests containing an authorised request for originating a priority call or other policy to determine which MCVideo groups are preferred.
- 10) if the determined MCVideo group ID cannot be added to the the candidate list of the MCVideo group information entries due to exceeding the MCVideo user's N2 limit, shall discard the candidate list of the MCVideo group information entries and skip the remaining steps of the current procedure; and
- 11) shall replace the list of the MCVideo group information entries stored in the served MCVideo client information entry with the candidate list of the MCVideo group information entries.

8.2.2.2.13 Implicit affiliation status change completion

This subclause is referenced from other procedures.

If the participating MCVideo function has received a SIP 2xx response from the controlling MCVideo function to a SIP request that had triggered performing the procedures of subclause 8.2.2.2.12, the participating MCVideo function:

- 1) shall set the affiliation status of the MCVideo group information entry added to the candidate list of the MCVideo group information entries by the procedures of subclause 8.2.2.2.12 to "affiliated"; and
- 2) shall perform the procedures specified in subclause 8.2.2.2.5 for the served MCVideo ID.

8.2.2.2.14 Implicit affiliation status change cancellation

This subclause is referenced from other procedures.

If the participating MCVideo function determines that a received SIP request that had triggered performing the procedures of subclause 8.2.2.2.12 needs to be rejected or if the participating MCVideo function receives a SIP 4xx,

5xx or 6xx response from the controlling MCVideo function for the received SIP request, the participating MCVideo function:

- 1) shall remove the MCVideo group ID entry added by the procedures of subclause 8.2.2.2.12 such that:
 - a) the MCVideo group information entry has the MCVideo group ID set to the MCVideo group ID of the MCVideo group targeted by the received SIP request;
 - b) the MCVideo group information entry is in the list of the MCVideo group information entries of an MCVideo client information entry containing the MCVideo client ID included in the received SIP request; and
 - c) the MCVideo client information entry is in the list of the MCVideo client information entries of the MCVideo user information entry containing the MCVideo ID of the sender of the received SIP request.

8.2.2.2.15 Implicit affiliation to configured groups procedure

This subclause is referenced from other procedures.

If the participating MCVideo function has successfully performed service authorisation for the MCVideo ID identified in the service authorisation procedure, the participating MCVideo function:

Editor's Note: Service authorisation for MCVideo needs to be specified in SA3.

- 1) shall identify the MCVideo ID included in the SIP request received for service authorisation procedure as the served MCVideo ID;
- 2) shall identify the MCVideo client ID from the <mcvideo-client-id> element contained in the application/vnd.3gpp.mcvideo-info+xml MIME body included in the SIP request received for service authorisation as the served MCVideo client ID;
- 3) shall download the MCVideo user profile from the MCVideo user database if not already stored at the participating MCVideo function;

Editor's Note: TS 29.283 does not yet include MCVideo requirements.

- 4) if no <ImplicitAffiliations> element is contained in the <OnNetwork> element of the MCVideo user profile document for the served MCVideo ID or the <ImplicitAffiliations> element contains no <entry> elements containing an MCVideo group ID, shall skip the remaining steps;

Editor's Note: The MCVideo user profile document doesn't yet exist. The above is a placeholder for the procedure that uses this MCVideo user profile document. The MCVideo user profile document needs to be specified in 3GPP TS 24.484.

- 5) shall consider an MCVideo user information entry such that:
 - a) the MCVideo user information entry is in the list of MCVideo user information entries described in subclause 8.2.2.2.2; and
 - b) the MCVideo ID of the MCVideo user information entry is equal to the served MCVideo ID; as the served MCVideo user information entry;
- 6) shall consider an MCVideo client information entry such that:
 - a) the MCVideo client information entry is in the list of MCVideo client information entries of the served MCVideo user information entry; and
 - b) the MCVideo client ID of the MCVideo client information entry is equal to the served MCVideo client ID; as the served MCVideo client information entry;
- 7) shall consider a copy of the list of the MCVideo group information entries of the served MCVideo client information entry as the served list of the MCVideo group information entries;
- 8) shall construct the candidate list of the MCVideo group information entries as follows:

- a) for each MCVideo group ID which has an MCVideo group information entry in the served list of the MCVideo group information entries shall copy the MCVideo group information entry into a new MCVideo group information entry of the candidate list of the MCVideo group information entries;
- b) for each MCVideo group ID contained in an <entry> element of the <ImplicitAffiliations> element in the <OnNetwork> element of the MCVideo user profile document for the served MCVideo ID that does not have an MCVideo group information entry in the served list of the MCVideo group information entries or has an MCVideo group information entry in the served list of the MCVideo group information entries such that the expiration time of the MCVideo group information entry has already expired:

Editor's Note: The MCVideo user profile document doesn't yet exist. The above is a placeholder for the procedure that uses this MCVideo user profile document. The MCVideo user profile document needs to be specified in 3GPP TS 24.484.

- i) shall add a new MCVideo group information entry in the candidate list of the MCVideo group information list for the MCVideo group ID;
 - ii) shall set the affiliation status of the new MCVideo group information entry to the "affiliating" state; and
 - iii) shall set the expiration time of the new MCVideo group information entry to the current time increased with the candidate expiration interval;
- c) if in step b) above, no new MCVideo group information entries were added to the candidate list of the MCVideo group information list for the MCVideo group ID:
 - i) shall discard the candidate list; and
 - ii) shall skip the remaining steps;
- 9) determine the candidate number of MCVideo group IDs as the number of different MCVideo group IDs which have an MCVideo group information entry:
- a) in the candidate list of the MCVideo group information entries; or
 - b) in the list of the MCVideo group information entries of an MCVideo client information entry such that:
 - i) the MCVideo client information entry is in the list of the MCVideo client information entries of the served MCVideo user information entry; and
 - ii) the MCVideo client ID of the MCVideo client information entry is not equal to the served MCVideo client ID;with the affiliation status set to the "affiliating" state or the "affiliated" state and with the expiration time which has not expired yet; and
 - c) if the candidate number of MCVideo group IDs is bigger than the N2 value of the served MCVideo ID, shall based on MCVideo service provider policy reduce the candidate MCVideo group IDs to that equal to N2;
- NOTE 1: The MCVideo service provider policy can determine to remove an MCVideo group ID based on the importance or priority of other MCVideo groups, received SIP requests containing an authorised request for originating a priority call or other policy to determine which MCVideo groups are preferred.
- 10) shall replace the list of the MCVideo group information entries stored in the served MCVideo client information entry with the candidate list of the MCVideo group information entries; and
- 11) for each MCVideo group ID contained in an <entry> element of the <ImplicitAffiliations> element in the <OnNetwork> element of the MCVideo user profile document for the served MCVideo ID and which has an MCVideo group information entry in the candidate list of the MCVideo group information entries with an affiliation status of "affiliating", shall perform the procedures specified in subclause 8.2.2.2.6 for the served MCVideo ID and each MCVideo group ID.

Editor's Note: The MCVideo user profile document doesn't yet exist. The above is a placeholder for the procedure that uses this MCVideo user profile document. The MCVideo user profile document needs to be specified in 3GPP TS 24.484.

NOTE 2: To learn of the MCVideo groups successfully affiliated to, the MCVideo client can subscribe to that information by the procedures specified in subclause 8.2.1.3.

8.2.2.3 Procedures of MCVideo server owning the MCVideo group

8.2.2.3.1 General

The procedures of MCVideo server owning the MCVideo group consist of:

- receiving group affiliation status change procedure;
- receiving subscription to affiliation status procedure;
- sending notification of change of affiliation status procedure;
- implicit affiliation eligibility check procedure; and
- affiliation status change by implicit affiliation procedure.

NOTE: Usage of CSC-3 part of MCVideo group affiliation procedure and of CSC-3 part of MCVideo group de-affiliation procedure is not specified in this version of the specification.

8.2.2.3.2 Stored information

The MCVideo server shall maintain a list of MCVideo group information entries.

In each MCVideo group information entry, the MCVideo server shall maintain:

- 1) an MCVideo group ID. This field uniquely identifies the MCVideo group information entry in the list of the MCVideo group information entries; and
- 2) a list of MCVideo user information entries.

In each MCVideo user information entry, the MCVideo server shall maintain:

- 1) an MCVideo ID. This field uniquely identifies the MCVideo user information entry in the list of the MCVideo user information entries;
- 2) a list of MCVideo client information entries; and
- 3) an expiration time.

In each MCVideo client information entry, the MCVideo server shall maintain:

- 1) an MCVideo client ID. This field uniquely identifies the MCVideo client information entry in the list of the MCVideo client information entries.

8.2.2.3.3 Receiving group affiliation status change procedure

Upon receiving a SIP PUBLISH request such that:

- 1) Request-URI of the SIP PUBLISH request contains the public service identity of the controlling MCVideo function associated with the served MCVideo group;
- 2) the SIP PUBLISH request contains an application/vnd.3gpp.mcvideo-info+xml MIME body containing the <mcvideo-request-uri> element and the <mcvideo-calling-user-identity> element;
- 3) the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Asserted-Service header field according to IETF RFC 6050 [14];
- 4) the Event header field of the SIP PUBLISH request contains the "presence" event type; and
- 5) SIP PUBLISH request contains an application/pidf+xml MIME body indicating per-group affiliation information constructed according to subclause 8.2.3.2;

then the MCVideo server:

- 1) shall identify the served MCVideo group ID in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP PUBLISH request;
- 2) shall identify the handled MCVideo ID in the <mcvideo-calling-user-identity> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP PUBLISH request;
- 3) if the Expires header field of the SIP PUBLISH request is not included or has nonzero value lower than 4294967295, shall send a SIP 423 (Interval Too Brief) response to the SIP PUBLISH request, where the SIP 423 (Interval Too Brief) response contains a Min-Expires header field set to 4294967295, and shall not continue with the rest of the steps;
- 4) if an MCVideo group for the served MCVideo group ID does not exist in the group management server according to 3GPP TS 24.381 [31], shall reject the SIP PUBLISH request with SIP 403 (Forbidden) response to the SIP PUBLISH request according to 3GPP TS 24.229 [11], IETF RFC 3903 [12] and IETF RFC 3856 [13] and skip the rest of the steps;
- 5) if the handled MCVideo ID is not a member of the MCVideo group identified by the served MCVideo group ID, shall reject the SIP PUBLISH request with SIP 403 (Forbidden) response to the SIP PUBLISH request according to 3GPP TS 24.229 [11], IETF RFC 3903 [12] and IETF RFC 3856 [13] and skip the rest of the steps;
- 6) shall respond with SIP 200 (OK) response to the SIP PUBLISH request according to 3GPP TS 24.229 [11], IETF RFC 3903 [12]. In the SIP 200 (OK) response, the MCVideo server:
 - a) shall set the Expires header field according to IETF RFC 3903 [12], to the selected expiration time;
- 7) if the "entity" attribute of the <presence> element of the application/pidf+xml MIME body of the SIP PUBLISH request is different than the served MCVideo group ID, shall not continue with the rest of the steps;
- 8) if the handled MCVideo ID is different from the MCVideo ID in the "id" attribute of the <tuple> element of the <presence> root element of the application/pidf+xml MIME body of the SIP PUBLISH request, shall not continue with the rest of the steps;
- 9) shall consider an MCVideo group information entry such that:
 - a) the MCVideo group information entry is in the list of MCVideo group information entries described in subclause 8.2.2.3.2; and
 - b) the MCVideo group ID of the MCVideo group information entry is equal to the served MCVideo group ID; as the served MCVideo group information entry;
- 10) if the selected expiration time is zero:
 - a) shall remove the MCVideo user information entry such that:
 - i) the MCVideo user information entry is in the list of the MCVideo user information entries of the served MCVideo group information entry; and
 - ii) the MCVideo user information entry has the MCVideo ID set to the served MCVideo ID;
- 11) if the selected expiration time is not zero:
 - a) shall consider an MCVideo user information entry such that:
 - i) the MCVideo user information entry is in the list of the MCVideo user information entries of the served MCVideo group information entry; and
 - ii) the MCVideo ID of the MCVideo user information entry is equal to the handled MCVideo ID; as the served MCVideo user information entry;
 - b) if the MCVideo user information entry does not exist:

- i) shall insert an MCVideo user information entry with the MCVideo ID set to the handled MCVideo ID into the list of the MCVideo user information entries of the served MCVideo group information entry; and
 - ii) shall consider the inserted MCVideo user information entry as the served MCVideo user information entry; and
 - c) shall set the following information in the served MCVideo user information entry:
 - i) set the MCVideo client ID list according to the "client" attributes of the <affiliation> elements of the <status> element of the <tuple> element of the <presence> root element of the application/pidf+xml MIME body of the SIP PUBLISH request; and
 - ii) set the expiration time according to the selected expiration time;
- 12) shall identify the handled p-id in the <p-id> child element of the <presence> root element of the application/pidf+xml MIME body of the SIP PUBLISH request; and
- 13) shall perform the procedures specified in subclause 8.2.2.3.5 for the served MCVideo group ID.

8.2.2.3.4 Receiving subscription to affiliation status procedure

NOTE: Usage of one SIP SUBSCRIBE request to subscribe for notification about change of affiliation state of several MCVideo users served by the same MCVideo server is not supported in this version of the specification.

Upon receiving a SIP SUBSCRIBE request such that:

- 1) Request-URI of the SIP SUBSCRIBE request contains the public service identity of the controlling MCVideo function associated with the served MCVideo group;
- 2) the SIP SUBSCRIBE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body containing the <mcvideo-request-uri> element and the <mcvideo-calling-user-identity> element;
- 3) the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Asserted-Service header field according to IETF RFC 6050 [14]; and
- 4) the Event header field of the SIP SUBSCRIBE request contains the "presence" event type;

then the MCVideo server:

- 1) shall identify the served MCVideo group ID in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP SUBSCRIBE request;
 - 2) shall identify the handled MCVideo ID in the <mcvideo-calling-user-identity> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP SUBSCRIBE request;
 - 3) if the Expires header field of the SIP SUBSCRIBE request is not included or has nonzero value lower than 4294967295, shall send a SIP 423 (Interval Too Brief) response to the SIP SUBSCRIBE request, where the SIP 423 (Interval Too Brief) response contains a Min-Expires header field set to 4294967295, and shall not continue with the rest of the steps;
 - 4) if an MCVideo group for the served MCVideo group ID does not exist in the group management server, shall reject the SIP SUBSCRIBE request with SIP 403 (Forbidden) response to the SIP SUBSCRIBE request according to 3GPP TS 24.229 [11], IETF RFC 3903 [12] and IETF RFC 3856 [13] and skip the rest of the steps;
- Editor's Note: Group management aspects for MCVideo need to be added in 24.481.**
- 5) if the handled MCVideo ID is not a member of the MCVideo group identified by the served MCVideo group ID, shall reject the SIP SUBSCRIBE request with SIP 403 (Forbidden) response to the SIP SUBSCRIBE request according to 3GPP TS 24.229 [11], IETF RFC 3903 [12] and IETF RFC 3856 [13] and skip the rest of the steps; and
 - 6) shall generate a SIP 200 (OK) response to the SIP SUBSCRIBE request according to 3GPP TS 24.229 [11], IETF RFC 6665 [16].

For the duration of the subscription, the MCVideo server shall notify subscriber about changes of the information of the served MCVideo ID, as described in subclause 8.2.2.2.5.

8.2.2.3.5 Sending notification of change of affiliation status procedure

In order to notify the subscriber identified by the handled MCVideo ID about changes of the affiliation status of the served MCVideo group ID, the MCVideo server:

- 1) shall consider an MCVideo group information entry such that:
 - a) the MCVideo group information entry is in the list of MCVideo group information entries described in subclause 8.2.2.3.2; and
 - b) the MCVideo group ID of the MCVideo group information entry is equal to the served MCVideo group ID;
- 2) shall consider an MCVideo user information entry such:
 - a) the MCVideo user information entry is in the list of the MCVideo user information entries of the served MCVideo group information entry; and
 - b) the MCVideo ID of the MCVideo user information entry is equal to the handled MCVideo ID;
as the served MCVideo user information entry;
- 3) shall generate an application/pidf+xml MIME body indicating per-group affiliation information according to subclause 9.3.1 and the served list of the served MCVideo user information entry of the MCVideo group information entry with following clarifications:
 - a) the MCVideo server shall include the "expires" attribute in the <affiliation> element; and
 - b) if this procedure is invoked by procedure in subclause 8.2.2.3.3 where the handled p-id was identified, the MCVideo server shall set the <p-id> child element of the <presentity> root element of the application/pidf+xml MIME body of the SIP NOTIFY request to the handled p-id value; and
- 4) send a SIP NOTIFY request according to 3GPP TS 24.229 [11], and IETF RFC 6665 [16]. In the SIP NOTIFY request, the MCVideo server shall include the generated application/pidf+xml MIME body indicating per-group affiliation information.

8.2.2.3.6 Implicit affiliation eligibility check procedure

This subclause is referenced from other procedures.

Upon receiving a SIP request for an MCVideo group that the MCVideo user is not currently affiliated to and that requires the controlling MCVideo function to check on the eligibility of the MCVideo user to be implicitly affiliated to the MCVideo group, the controlling MCVideo function:

- 1) shall identify the served MCVideo group ID in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP request;
- 2) shall identify the handled MCVideo ID in the <mcvideo-calling-user-identity> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP request;
- 3) if an MCVideo group for the served MCVideo group ID does not exist in the group management server, shall consider the MCVideo user to be ineligible for implicit affiliation and skip the rest of the steps;

Editor's Note: Group management aspects for MCVideo need to be added in 24.481.

- 4) if the handled MCVideo ID is not a member of the MCVideo group identified by the served MCVideo group ID, shall consider the MCVideo user to be ineligible for implicit affiliation and skip the rest of the steps;
- 5) if there is no MCVideo group information entry in the list of MCVideo group information entries described in subclause 8.2.2.3.2 with an MCVideo group identity matching the served MCVideo group ID, then shall consider the MCVideo user to be ineligible for implicit affiliation and skip the rest of the steps; or
- 6) shall consider the MCVideo user to be eligible for implicit affiliation.

8.2.2.3.7 Affiliation status change by implicit affiliation procedure

This subclause is referenced from other procedures.

Upon receiving a SIP request for an MCVideo group that the MCVideo user is not currently affiliated to and that requires the controlling MCVideo function to perform an implicit affiliation to, the controlling MCVideo function:

- 1) shall identify the served MCVideo group ID in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP request;
- 2) shall identify the handled MCVideo ID in the <mcvideo-calling-user-identity> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP request;
- 3) shall consider an MCVideo group information entry such that:
 - a) the MCVideo group information entry is in the list of MCVideo group information entries described in subclause 8.2.2.3.2; and
 - b) the MCVideo group ID of the MCVideo group information entry is equal to the served MCVideo group ID; as the served MCVideo group information entry;
- 4) shall consider an MCVideo user information entry such that:
 - a) the MCVideo user information entry is in the list of the MCVideo user information entries of the served MCVideo group information entry; and
 - b) the MCVideo ID of the MCVideo user information entry is equal to the handled MCVideo ID; as the served MCVideo user information entry;
 - c) if the MCVideo user information entry does not exist:
 - i) shall insert an MCVideo user information entry with the MCVideo ID set to the handled MCVideo ID into the list of the MCVideo user information entries of the served MCVideo group information entry; and
 - ii) shall consider the inserted MCVideo user information entry as the served MCVideo user information entry; and
 - d) shall make the following modifications in the served MCVideo user information entry:
 - i) add the MCVideo client ID derived from the received SIP request to the MCVideo client ID list if not already present; and
 - ii) set the expiration time as determined by local policy;
- 5) shall perform the procedures specified in subclause 8.2.2.3.5 for the served MCVideo group ID.

8.3 Coding

8.3.1 Extension of application/pidf+xml MIME type

8.3.1.1 Introduction

The parent subclause of this subclause describes an extension of the application/pidf+xml MIME body specified in IETF RFC 3863 [18]. The extension is used to indicate:

- per-user affiliation information; and
- per-group affiliation information.

8.3.1.2 Syntax

The application/pidf+xml MIME body indicating per-user affiliation information is constructed according to IETF RFC 3863 [18] and:

- 1) contains a <presence> root element according to IETF RFC 3863 [18];
- 2) contains an "entity" attribute of the <presence> element set to the MCVideo ID of the MCVideo user;
- 3) contains one <tuple> child element according to IETF RFC 3863 [18] per each MCVideo client of the <presence> element;
- 4) can contain a <p-id> child element defined in the XML schema defined in table 8.3.1.2-1, of the <presence> element set to an identifier of a SIP PUBLISH request;
- 5) contains an "id" attribute of the <tuple> element set to the MCVideo client ID;
- 6) contains one <status> child element of each <tuple> element;
- 7) contains one <affiliation> child element defined in the XML schema defined in table 8.3.1.2-1, of the <status> element, for each MCVideo group in which the MCVideo user is interested at the MCVideo client;
- 8) contains a "group" attribute of each <affiliation> element set to the MCVideo group ID of the MCVideo group in which the MCVideo user is interested at the MCVideo client;
- 9) can contain a "status" attribute of each <affiliation> element indicating the affiliation status of the MCVideo user to MCVideo group at the MCVideo client; and
- 10) can contain an "expires" attribute of each <affiliation> element indicating expiration of affiliation of the MCVideo user to MCVideo group at the MCVideo client.

The application/pidf+xml MIME body indicating per-group affiliation information is constructed according to IETF RFC 3856 [13] and:

- 1) contains the <presence> root element according to IETF RFC 3863 [18];
- 2) contains an "entity" attribute of the <presence> element set to the MCVideo group ID of the MCVideo group;
- 3) contains one <tuple> child element according to IETF RFC 3863 [18] of the <presence> element;
- 4) can contain a <p-id> child element defined in the XML schema defined in table 8.3.1.2-1, of the <presence> element set to an identifier of a SIP PUBLISH request;
- 5) contains an "id" attribute of the <tuple> element set to the MCVideo ID of the MCVideo user;
- 6) contains one <status> child element of each <tuple> element;
- 7) contains one <affiliation> child element defined in the XML schema defined in table 8.3.1.2-1, of the <status> element, for each MCVideo client at which the MCVideo user is interested in the MCVideo group;
- 8) contains one "client" attribute defined in the XML schema defined in table 8.3.1.2-2, of the <affiliation> element set to the MCVideo client ID; and
- 9) can contain an "expires" attribute defined in the XML schema defined in table 8.3.1.2-2, of the <affiliation> element indicating expiration of affiliation of the MCVideo user to MCVideo group at the MCVideo client.

Table 8.3.1.2-1: XML schema with elements and attributes extending the application/pidf+xml MIME body

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema
  targetNamespace="urn:3gpp:ns:mcvideoPresInfo:1.0"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:mcvideoPI10="urn:3gpp:ns:mcvideoPresInfo:1.0"
  elementFormDefault="qualified" attributeFormDefault="unqualified">

  <!-- MCVideo specific child elements of tuple element -->
  <xs:element name="affiliation" type="mcvideoPI10:affiliationType"/>
```

```

<xs:complexType name="affiliationType">
  <xs:sequence>
    <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
  </xs:sequence>
  <xs:attribute name="group" type="xs:anyURI" use="optional" />
  <xs:attribute name="client" type="xs:anyURI" use="optional" />
  <xs:attribute name="status" type="mcvideoPI10:statusType" use="optional" />
  <xs:attribute name="expires" type="xs:dateTime" use="optional" />
  <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>

<xs:simpleType name="statusType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="affiliating" />
    <xs:enumeration value="affiliated" />
    <xs:enumeration value="deaffiliating" />
  </xs:restriction>
</xs:simpleType>

<xs:element name="p-id" type="xs:string" />

</xs:schema>

```

The application/pidf+xml MIME body refers to namespaces using prefixes specified in table 8.3.1.2-2.

Table 8.3.1.2-2: Assignment of prefixes to namespace names in the application/pidf+xml MIME body

Prefix	Namespace
mcvideoPI10	urn:3gpp:ns:mcvideoPresInfo:1.0
NOTE:	The "urn:ietf:params:xml:ns:pidf" namespace is the default namespace so no prefix is used for it in the application/pidf+xml MIME body.

8.3.2 Extension of application/simple-filter+xml MIME type

8.3.2.1 Introduction

The parent subclause of this subclause describes extension of the application/simple-filter+xml MIME body specified in IETF RFC 4661 [19].

The extension is used to indicate per-client restrictions of presence event package notification information and per-user restrictions of presence event package notification information.

8.3.2.2 Syntax

The application/simple-filter+xml MIME body indicating per client restrictions of presence event package notification information is constructed according to IETF RFC 4661 [19] and:

- 1) contains a <filter-set> root element according to IETF RFC 4661 [19];
- 2) contains a <ns-bindings> child element according to IETF RFC 4661 [19], of the <filter-set> element;
- 3) contains a <ns-binding> child element according to IETF RFC 4661 [19], of the <ns-bindings> element where the <ns-binding> element:
 - A) does not contain a "prefix" attribute according to IETF RFC 4661 [19]; and
 - B) contains an "urn" attribute set to the "urn:ietf:params:xml:ns:pidf" value;
- 4) contains a <ns-binding> child element according to IETF RFC 4661 [19], of the <ns-bindings> element where the <ns-binding> element:
 - A) contains a "prefix" attribute according to IETF RFC 4661 [19], set to "mcvideoPI10"; and
 - B) contains an "urn" attribute according to IETF RFC 4661 [19], set to the "urn:3gpp:ns:mcvideoPresInfo:1.0" value;

- 5) contains a <filter> child element according to IETF RFC 4661 [19], of the <filter-set> element where the <filter> element;
 - A) contains an "id" attribute set to a value constructed according to IETF RFC 4661 [19];
 - B) does not contain an "uri" attribute of the <filter> child element according to IETF RFC 4661 [19]; and
 - C) does not contain an "domain" attribute according to IETF RFC 4661 [19];
- 6) contains a <what> child element according to IETF RFC 4661 [19], of the <filter> element; and
- 7) contains an <include> child element according to IETF RFC 4661 [19], of the <what> element where the <include> element;
 - A) does not contain a "type" attribute according to IETF RFC 4661 [19]; and
 - B) contains the value, according to IETF RFC 4661 [19], set to concatenation of the '//presence/tuple[@id="" string, the MCVideo client ID, and the "]" string.

The application/simple-filter+xml MIME body indicating per user restrictions of presence event package notification information is constructed according to IETF RFC 4661 [19] and:

- 1) contains a <filter-set> root element according to IETF RFC 4661 [19];
- 2) contains a <ns-bindings> child element according to IETF RFC 4661 [19], of the <filter-set> element;
- 3) contains a <ns-binding> child element according to IETF RFC 4661 [19], of the <ns-bindings> element where the <ns-binding> element:
 - A) does not contain a "prefix" attribute according to IETF RFC 4661 [19]; and
 - B) contains an "urn" attribute set to the "urn:ietf:params:xml:ns:pidf" value;
- 4) contains a <ns-binding> child element according to IETF RFC 4661 [19], of the <ns-bindings> element where the <ns-binding> element:
 - A) contains a "prefix" attribute according to IETF RFC 4661 [19], set to "mcvideoPI10"; and
 - B) contains an "urn" attribute according to IETF RFC 4661 [19], set to the "urn:3gpp:ns:mcvideoPresInfo:1.0" value;
- 5) contains a <filter> child element according to IETF RFC 4661 [19], of the <filter-set> element where the <filter> element;
 - A) contains an "id" attribute set to a value constructed according to IETF RFC 4661 [19];
 - B) does not contain an "uri" attribute of the <filter> child element according to IETF RFC 4661 [19]; and
 - C) does not contain an "domain" attribute according to IETF RFC 4661 [19];
- 6) contains a <what> child element according to IETF RFC 4661 [19], of the <filter> element; and
- 7) contains an <include> child element according to IETF RFC 4661 [19], of the <what> element where the <include> element;
 - A) does not contain a "type" attribute according to IETF RFC 4661 [19]; and
 - B) contains the value, according to IETF RFC 4661 [19], set to concatenation of the '//presence/tuple[@id="" string, the MCVideo ID, and the "]" string.

9 Group call

9.1 General

9.2 On-network group call

9.2.1 Prearranged group call

9.2.1.1 General

9.2.1.2 MCVideo client procedures

Editor's Note: All subclauses x.x.x are not yet specified for MCVideo and need to be added in 24.281, 24.481, 24.484, and 24.581.

9.2.1.2.1 On-demand prearranged group call

9.2.1.2.1.1 Client originating procedures

Upon receiving a request from an MCVideo user to establish an MCVideo prearranged group session the MCVideo client shall generate an initial SIP INVITE request by following the UE originating session procedures specified in 3GPP TS 24.229 [11], with the clarifications given below.

The MCVideo client:

- 1) if the MCVideo user has requested the origination of an MCVideo emergency group call or is originating an MCVideo prearranged group call and the MCVideo emergency state is already set, the MCVideo client shall comply with the procedures in subclause x.x.x;
- 2) if the MCVideo user has requested the origination of an MCVideo imminent peril group call, the MCVideo client shall comply with the procedures in subclause x.x.x;
- 3) if the MCVideo user has requested the origination of a broadcast group call, the MCVideo client shall comply with the procedures in subclause x.x.x;
- 4) shall include the g.3gpp.mcvideo media feature tag and the g.3gpp.icsi-ref media feature tag with the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo" in the Contact header field of the SIP INVITE request according to IETF RFC 3840 [22];
- 5) shall include an Accept-Contact header field containing the g.3gpp.mcvideo media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [20];
- 6) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Preferred-Service header field according to IETF RFC 6050 [14] in the SIP INVITE request;
- 7) 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.mcvideo" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [20];
- 8) should include the "timer" option tag in the Supported header field;
- 9) should include the Session-Expires header field according to IETF RFC 4028 [23]. It is recommended that the "refresher" header field parameter is omitted. If included, the "refresher" header field parameter shall be set to "uac";
- 10) shall set the Request-URI of the SIP INVITE request to the public service identity identifying the participating MCVideo function serving the MCVideo user;

NOTE 1: The MCVideo client is configured with public service identity identifying the participating MCVideo function serving the MCVideo user.

- 11) 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 [11];
- 12) if the MCVideo emergency state is already set or the MCVideo client emergency group state for this group is set to "MEG 2: in-progress", the MCVideo client shall include the Resource-Priority header field and comply with the procedures in subclause x.x.x;
- 13) if the MCVideo client imminent peril group state for this group is set to "MIG 2: in-progress" or "MIG 3: confirm-pending" shall include the Resource-Priority header field and comply with the procedures in subclause x.x.x;
- 14) shall contain in an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with:
 - a) the <session-type> element set to a value of "prearranged";
 - b) the <mcvideo-request-uri> element set to the group identity;
 - c) the <mcvideo-client-id> element set to the MCVideo client ID of the originating MCVideo client; and

NOTE 2: The MCVideo client does not include the MCVideo ID of the originating MCVideo user in the body, as this will be inserted into the body of the SIP INVITE request that is sent from the originating participating MCVideo function.

- d) if the group identity can be determined to be a TGI and if the MCVideo client can associate the TGI with a MCVideo group ID, the <associated-group-id> element set to the MCVideo group ID;

NOTE 3: The text "can associate the TGI with a MCVideo group ID" means that the MCVideo client is able to determine that there is a constituent group of the temporary group that it is a member of.

NOTE 4: The MCVideo client is informed about temporary groups and regrouping of MCVideo groups that the user is a member of as specified in 3GPP TS 24.481 [24].

NOTE 5: If the MCVideo user selected a TGI where there are several MCVideo groups where the MCVideo user is a member, the MCVideo client selects one of those MCVideo groups.

- 15) shall include an SDP offer according to 3GPP TS 24.229 [11] with the clarifications given in subclause x.x.x; and
- 16) shall send the SIP INVITE request towards the MCVideo server according to 3GPP TS 24.229 [11].

On receiving a SIP 2xx response to the SIP INVITE request, the MCVideo client:

- 1) shall interact with the user plane as specified in 3GPP TS 24.581 [5] ;
- 2) if the MCVideo emergency group call state is set to "MEGC 2: emergency-call-requested" or "MEGC 3: emergency-call-granted" or the MCVideo imminent peril group call state is set to "MIGC 2: imminent-peril-call-requested" or "MIGC 3: imminent-peril-call-granted", the MCVideo client shall perform the actions specified in subclause x.x.x; and
- 3) may subscribe to the conference event package as specified in subclause x.x.x.

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

- 1) if the MCVideo emergency group call state is set to "MEGC 2: emergency-call-requested" or "MEGC 3: emergency-call-granted"; or
- 2) if the MCVideo imminent peril group call state is set to "MIGC 2: imminent-peril-call-requested" or "MIGC 3: imminent-peril-call-granted";

the MCVideo client shall perform the actions specified in subclause x.x.x.

On receiving a SIP INFO request where the Request-URI contains an MCVideo session ID identifying an ongoing group session, the MCVideo client shall follow the actions specified in subclause x.x.x.

Editor's Note: Group call states need to be defined.

9.2.1.2.1.2 Client terminating procedures

In the procedures in this subclause:

- 1) emergency indication in an incoming SIP INVITE request refers to the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body; and
- 2) imminent peril indication in an incoming SIP INVITE request refers to the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body.

Upon receipt of an initial SIP INVITE request, the MCVideo client shall follow the procedures for termination of multimedia sessions in the IM CN subsystem as specified in 3GPP TS 24.229 [11] with the clarifications below.

The MCVideo client:

- 1) may reject the SIP INVITE request if either of the following conditions are met:
 - a) MCVideo client does not have enough resources to handle the call; or
 - b) any other reason outside the scope of this specification;and skip the rest of the steps;
- 2) if the SIP INVITE request is rejected in step 1), shall respond toward participating MCVideo function either with appropriate reject code as specified in 3GPP TS 24.229 [51] and warning texts as specified in subclause x.x.x or with SIP 480 (Temporarily unavailable) response not including warning texts if the user is authorised to restrict the reason for failure and skip the rest of the steps of this subclause;

NOTE: If the SIP INVITE request contains an emergency indication or imminent peril indication, the MCVideo client can by means beyond the scope of this specification choose to accept the request.

- 3) shall check if a Resource-Priority header field is included in the incoming SIP 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 [11];
- 4) if the SIP INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <emergency-ind> element set to a value of "true":
 - a) should display to the MCVideo user an indication that this is a SIP INVITE request for an MCVideo emergency group call and:
 - i) should display the MCVideo ID of the originator of the MCVideo emergency group call contained in the <mcvideo-calling-user-id> element of the application/vnd.3gpp.mcvideo-info+xml MIME body;
 - ii) should display the MCVideo group identity of the group with the emergency condition contained in the <mcvideo-calling-group-id> element; and
 - iii) if the <alert-ind> element is set to "true", should display to the MCVideo user an indication of the MCVideo emergency alert and associated information;
 - b) shall set the MCVideo emergency group state to "MEG 2: in-progress";
 - c) shall set the MCVideo imminent peril group state to "MIG 1: no-imminent-peril"; and
 - d) shall set the MCVideo imminent peril group call state to "MIGC 1: imminent-peril-gc-capable"; otherwise
- 5) if the SIP INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <imminentperil-ind> element set to a value of "true":
 - a) should display to the MCVideo user an indication that this is a SIP INVITE request for an MCVideo imminent peril group call and:

- i) should display the MCVidéo ID of the originator of the MCVidéo imminent peril group call contained in the <mcvideo-calling-user-id> element of the application/vnd.3gpp.mcvideo-info+xml MIME body; and
 - ii) should display the MCVidéo group identity of the group with the imminent peril condition contained in the <mcvideo-calling-group-id> element; and
- b) shall set the MCVidéo imminent peril group state to "MIG 3: in-progress";
- 6) may display to the MCVidéo user the MCVidéo ID of the inviting MCVidéo user;
 - 7) shall perform the automatic commencement procedures specified in subclause x.x.x if one of the following conditions are met:
 - a) SIP INVITE request contains an Answer-Mode header field with the value "Auto" and the MCVidéo service setting at the invited MCVidéo client for answering the call is set to automatic commencement mode; or
 - b) SIP INVITE request contains an Answer-Mode header field with the value "Auto" and the MCVidéo service setting at the invited MCVidéo client for answering the call is set to manual commencement mode, yet the invited MCVidéo client allows the call to be answered with automatic commencement mode;
 - 8) shall perform the manual commencement procedures specified in subclause x.x.x if one of the following conditions are met:
 - a) SIP INVITE request contains an Answer-Mode header field with the value "Manual" and the MCVidéo service setting at the invited MCVidéo client for answering the call is to use manual commencement mode; or
 - b) SIP INVITE request contains an Answer-Mode header field with the value "Manual" and the MCVidéo service setting at the invited MCVidéo client for answering the call is set to automatic commencement mode, yet the invited MCVidéo client allows the call to be answered with manual commencement mode; and
 - 9) when the SIP 200 (OK) response to the SIP INVITE request is sent, may subscribe to the conference event package as specified in subclause x.x.x.

Editor's Note: the commencement mode for MCVidéo needs to be reviewed to align with stage 2 requirements for MCVidéo.

9.2.1.2.1.3 MCVidéo upgrade to in-progress emergency or imminent peril

This subclause covers both on-demand session.

Upon receiving a request from an MCVidéo user to upgrade the MCVidéo group session to an emergency condition or an imminent peril condition on an MCVidéo prearranged group, the MCVidéo client shall generate a SIP re-INVITE request as specified in 3GPP TS 24.229 [11], with the clarifications given below.

- 1) if the MCVidéo user is requesting to upgrade the MCVidéo group session to an in-progress emergency group state and this is an unauthorised request for an MCVidéo emergency call as determined by the procedures of subclause x.x.x, the MCVidéo client:
 - a) should indicate to the MCVidéo user that they are not authorised to upgrade the MCVidéo group session to an in-progress emergency group state; and
 - b) shall skip the remaining steps of the current subclause;
- 2) if the MCVidéo user is requesting to upgrade the MCVidéo group session to an in-progress imminent peril state and this is an unauthorised request for an MCVidéo imminent peril group call as determined by the procedures of subclause x.x.x, the MCVidéo client:
 - a) should indicate to the MCVidéo user that they are not authorised to upgrade the MCVidéo group session to an in-progress imminent peril group state; and
 - b) shall skip the remaining steps of the current subclause;
- 3) if the MCVidéo user has requested to upgrade the MCVidéo group session to an MCVidéo emergency call, the MCVidéo client:

- a) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body populated as specified in subclause x.x.x;
 - b) if an indication of an MCVideo emergency alert is to be included, shall perform the procedures specified in subclause x.x.x for the MCVideo emergency alert trigger; and
 - c) shall include a Resource-Priority header field and comply with the procedures in subclause x.x.x.
- 4) if the MCVideo user has requested to upgrade the MCVideo group session to an MCVideo imminent peril call, the MCVideo client:
- a) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body populated as specified in subclause x.x.x; and
 - b) shall include a Resource-Priority header field and comply with the procedures in subclause x.x.x;
- 5) if the SIP re-INVITE request is to be sent within an on-demand session, shall include in the SIP re-INVITE request an SDP offer according to 3GPP TS 24.229 [11] with the clarifications specified in subclause x.x.x; and
- 6) shall send the SIP re-INVITE request according to 3GPP TS 24.229 [11].

On receiving a SIP 2xx response to the SIP re-INVITE request the MCVideo client:

- 1) shall interact with the user plane as specified in 3GPP TS 24.581 [5]; and
- 2) shall perform the actions specified in subclause x.x.x.

On receiving a SIP INFO request where the Request-URI contains an MCVideo session ID identifying an ongoing group session, the MCVideo client shall follow the actions specified in subclause x.x.x.

On receiving a SIP 4xx response, SIP 5xx response or a SIP 6xx response to the SIP re-INVITE request the MCVideo client shall perform the actions specified in subclause x.x.x.

9.2.1.2.1.4 MCVideo in-progress emergency cancel

This subclause covers both on-demand session and pre-established sessions.

Upon receiving a request from an MCVideo user to cancel the in-progress emergency condition on a prearranged MCVideo group, the MCVideo client shall generate a SIP re-INVITE request by following the UE originating session procedures specified in 3GPP TS 24.229 [11], with the clarifications given below.

The MCVideo client:

- 1) if the MCVideo user is not authorised to cancel the in-progress emergency group state of the MCVideo group as determined by the procedures of subclause x.x.x, the MCVideo client:
 - a) should indicate to the MCVideo user that they are not authorised to cancel the in-progress emergency group state of the MCVideo group; and
 - b) shall skip the remaining steps of the current subclause;
- 2) shall, if the MCVideo user is cancelling an in-progress emergency condition and optionally an MCVideo emergency alert originated by the MCVideo user, include an application/vnd.3gpp.mcvideo-info+xml MIME body populated as specified in subclause x.x.x;
- 3) shall, if the MCVideo user is cancelling an in-progress emergency condition and an MCVideo emergency alert originated by another MCVideo user, include an application/vnd.3gpp.mcvideo-info+xml MIME body populated as specified in subclause x.x.x;
- 4) shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with:
 - a) the <session-type> element set to a value of "prearranged"; and
 - b) the <mcvideo-request-uri> element set to the group identity;

NOTE 1: The MCVideo ID of the originating MCVideo user is not included in the body, as this will be inserted into the body of the SIP INVITE request that is sent by the originating participating MCVideo function.

- 5) shall include the g.3gpp.mcvideo media feature tag in the Contact header field of the SIP re-INVITE request according to IETF RFC 3840 [22];
- 6) if the SIP re-INVITE request is to be sent within an on-demand session, shall include in the SIP re-INVITE request an SDP offer according to 3GPP TS 24.229 [51] with the clarifications specified in subclause x.x.x;
- 7) shall include a Resource-Priority header field and comply with the procedures in subclause x.x.x; and
- 8) shall send the SIP re-INVITE request according to 3GPP TS 24.229 [11].

On receiving a SIP 2xx response to the SIP re-INVITE request, the MCVideo client:

- 1) shall interact with the user plane as specified in 3GPP TS 24.581 [5];
- 2) shall set the MCVideo emergency group state of the group to "MEG 1: no-emergency";
- 3) shall set the MCVideo emergency group call state of the group to "MEGC 1: emergency-gc-capable"; and
- 4) if the MCVideo emergency alert state is set to "MEA 4: Emergency-alert-cancel-pending", the sent SIP re-INVITE request did not contain an <originated-by> element in the application/vnd.3gpp.mcvideo-info+xml MIME body and the SIP 2xx response to the SIP request for a priority group call does not contain a Warning header field as specified in subclause 4.4 with the warning text containing the mcvideo-warn-code set to "149", shall set the MCVideo emergency alert state to "MEA 1: no-alert".

On receiving a SIP INFO request where the Request-URI contains an MCVideo session ID identifying an ongoing group session, the MCVideo client shall follow the actions specified in subclause x.x.x.

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

- 1) shall set the MCVideo emergency group state as "MEG 2: in-progress";
- 2) if the SIP 4xx response, SIP 5xx response or SIP 6xx response contains an application/vnd.3gpp.mcvideo-info+xml MIME body with an <alert-ind> element set to a value of "true" and the sent SIP re-INVITE request did not contain an <originated-by> element in the application/vnd.3gpp.mcvideo-info+xml MIME body, the MCVideo client shall set the MCVideo emergency alert state to "MEA 3: emergency-alert-initiated"; and
- 3) if the SIP 4xx response, SIP 5xx response or SIP 6xx response did not contain an application/vnd.3gpp.mcvideo-info+xml MIME body with an <alert-ind> element and did not contain an <originated-by> element, the MCVideo emergency alert (MEA) state shall revert to its value prior to entering the current procedure.

NOTE 3: If the in-progress emergency group state cancel request is rejected, the state of the session does not change, i.e. continues with MCVideo emergency group call level priority.

9.2.1.2.1.5 MCVideo in-progress imminent peril cancel

This subclause covers both on-demand session.

Upon receiving a request from an MCVideo user to cancel the in-progress imminent peril condition on a prearranged MCVideo group, the MCVideo client shall generate a SIP re-INVITE request by following the procedures specified in 3GPP TS 24.229 [11], with the clarifications given below.

The MCVideo client:

- 1) if the MCVideo user is not authorised to cancel the in-progress imminent peril group state of the MCVideo group as determined by the procedures of subclause x.x.x, the MCVideo client:
 - a) should indicate to the MCVideo user that they are not authorised to cancel the in-progress imminent peril group state of the MCVideo group; and
 - b) shall skip the remaining steps of the current subclause;
- 2) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body populated as specified in subclause x.x.x; and

- 3) shall include a Resource-Priority header field and comply with the procedures in subclause x.x.x;
- 4) shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with:
 - a) the <session-type> element set to a value of "prearranged"; and
 - b) the <mcvideo-request-uri> element set to the group identity;

NOTE 1: The MCVideo ID of the originating MCVideo user is not included in the body, as this will be inserted into the body of the SIP re-INVITE request that is sent by the originating participating MCVideo function.

- 5) shall include the g.3gpp.mcvideo media feature tag in the Contact header field of the SIP re-INVITE request according to IETF RFC 3840 [22];
- 6) if the SIP re-INVITE request is to be sent within an on-demand session, shall include in the SIP re-INVITE request an SDP offer according to 3GPP TS 24.229 [11] with the clarifications specified in subclause x.x.x; and
- 7) shall send the SIP re-INVITE request according to 3GPP TS 24.229 [11].

On receiving a SIP 2xx response to the SIP re-INVITE request, the MCVideo client:

- 1) shall interact with the user plane as specified in 3GPP TS 24.581 [5];
- 2) shall set the MCVideo imminent peril group state of the group to "MIG 1: no-imminent-peril"; and
- 3) shall set the MCVideo imminent peril group call state of the group to "MIGC 1: imminent-peril-gc-capable".

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

- 1) if the SIP 4xx response, SIP 5xx response or SIP 6xx response:
 - a) contains an application/vnd.3gpp.mcvideo-info+xml MIME body with an <imminentperil-ind> element set to a value of "true"; or
 - b) does not contain an application/vnd.3gpp.mcvideo-info+xml MIME body with an <imminentperil-ind> element;

then the MCVideo client shall set the MCVideo imminent peril group state as "MIG 2: in-progress".

NOTE 3: This is the case where the MCVideo client requested the cancellation of the MCVideo imminent peril in-progress state and was rejected.

9.2.1.2.1.6 MCVideo client receives SIP re-INVITE request

This subclause covers both on-demand session.

Upon receipt of a SIP re-INVITE request the MCVideo client:

- 1) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <emergency-ind> element set to a value of "true":
 - a) should display to the MCVideo user the MCVideo ID of the originator of the MCVideo emergency group call and an indication that this is an MCVideo emergency group call;
 - b) if the <mcvideoinfo> element containing the <mcvideo-Params> element contains an <alert-ind> element set to "true", should display to the MCVideo user an indication of the MCVideo emergency alert and associated information;
 - c) shall set the MCVideo emergency group state to "MEG 2: in-progress"; and
 - d) shall set the MCVideo imminent peril group state to "MIG 1: no-imminent-peril";

- 2) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <imminentperil-ind> element set to a value of "true":
 - a) should display to the MCVideo user the MCVideo ID of the originator of the MCVideo imminent peril group call and an indication that this is an MCVideo imminent peril group call; and
 - b) shall set the MCVideo imminent peril group state to "MIG 2: in-progress";
- 3) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <emergency-ind> element set to a value of "false":
 - a) should display to the MCVideo user the MCVideo ID of the MCVideo user cancelling the MCVideo emergency group call;
 - b) if the <mcvideoinfo> element containing the <mcvideo-Params> element contains an <alert-ind> element set to "false":
 - i) should display to the MCVideo user an indication of the MCVideo emergency alert cancellation and the MCVideo ID of the MCVideo user cancelling the MCVideo emergency alert; and
 - ii) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body including an <originated-by> element:
 - A) should display to the MCVideo user the MCVideo ID contained in the <originated-by> element of the MCVideo user that originated the MCVideo emergency alert; and
 - B) if the MCVideo ID contained in the <originated-by> element is the MCVideo ID of the receiving MCVideo user shall set the MCVideo emergency alert state to "MEA 1: no-alert";
 - c) shall set the MCVideo emergency group state to "MEG 1: no-emergency"; and
 - d) if the MCVideo emergency group call state of the group is set to "MEGC 3: emergency-call-granted", shall set the MCVideo emergency group call state of the group to "MEGC 1: emergency-gc-capable";
- 4) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <imminentperil-ind> element set to a value of "false":
 - a) should display to the MCVideo user the MCVideo ID of the MCVideo user cancelling the MCVideo imminent peril group call and an indication that this is an MCVideo imminent peril group call; and
 - b) shall set the MCVideo imminent peril group state to "MIG 1: no-imminent-peril";
- 5) 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 [11];
- 6) shall accept the SIP re-INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [11];
- 7) shall include the g.3gpp.mcvideo media feature tag in the Contact header field of the SIP 200 (OK) response;
- 8) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo" in the Contact header field of the SIP 200 (OK) response;
- 9) if the SIP re-INVITE request was received within an on-demand session, 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 [11] with the clarifications given in subclause x.x.x;
- 10) shall send the SIP 200 (OK) response towards the MCVideo server according to rules and procedures of 3GPP TS 24.229 [11]; and
- 11) shall interact with the media plane as specified in 3GPP TS 24.581 [5].

9.2.1.2.3 End group call

9.2.1.2.3.1 Client originating procedures on-demand

When an MCVideo client wants to leave the MCVideo session that has been established using on-demand session, the MCVideo client shall follow the procedures as specified in subclause x.x.x.

9.2.1.2.3.3 Client terminating procedures

Upon receiving a SIP BYE request for releasing the prearranged MCVideo group call, the MCVideo client shall follow the procedures as specified in subclause x.x.x.

9.2.1.2.4 Re-join procedure

9.2.1.2.4.1 On demand session establishment

Upon receiving a request from an MCVideo user to re-join an ongoing MCVideo session or triggered by coming back from out of coverage, the MCVideo client shall generate an initial SIP INVITE request by following the UE originating session procedures specified in 3GPP TS 24.229 [11], with the clarifications given below.

NOTE: How an MCVideo client is informed whether it comes back from out of coverage is out of scope of present document.

The MCVideo client shall follow the procedures specified in subclause 9.2.1.2.1.1 with the clarification in step 9) of subclause 9.2.1.2.1.1 that the Request-URI of the SIP INVITE request shall contain a URI of the MCVideo session identity to re-join.

9.2.1.3 Participating MCVideo function procedures

Editor's Note: All subclauses x.x.x are not yet specified for MCVideo and need to be added in 24.281, 24.481, 24.484, and 24.581.

9.2.1.3.1 Originating procedures

9.2.1.3.1.1 On demand prearranged group call

In the procedures in this subclause:

- 1) group identity in an incoming SIP INVITE request refers to the group identity from the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the incoming SIP INVITE request;
- 2) emergency indication in an incoming SIP INVITE request refers to the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body; and
- 3) imminent peril indication in an incoming SIP INVITE request refers to the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body.

Upon receipt of a "SIP INVITE request for originating participating MCVideo function" containing an application/vnd.3gpp.mcvideo-info+xml MIME body with the <session-type> element set to a value of "prearranged", the participating MCVideo function:

Editor's Note: the distinction of different SIP INVITE requests received by the MCVideo function will be specified in another clause of this specification.

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP INVITE request with a SIP 500 (Server Internal Error) response. The participating MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15]. Otherwise, continue with the rest of the steps;

NOTE 1: if the SIP INVITE request contains an emergency indication or an imminent peril indication set to a value of "true" and this is an authorised request for originating a priority call as determined by subclause x.x.x.x, the participating MCVideo function can according to local policy choose to accept the request.

2) shall determine the MCVideo ID of the calling user from public user identity in the P-Asserted-Identity header field of the SIP INVITE request, and shall authorise the calling user;

NOTE 2: The MCVideo ID of the calling user is bound to the public user identity at the time of service authorisation, as documented in subclause x.x.

3) if through local policy in the participating MCVideo function, the user identified by the MCVideo ID is not authorised to initiate prearranged group calls, shall reject the "SIP INVITE request for originating participating MCVideo function" with a SIP 403 (Forbidden) response to the SIP INVITE request, with warning text set to "109 user not authorised to make prearranged group calls" in a Warning header field as specified in subclause x.x;

4) shall validate the media parameters and if the MCVideo codecs are not offered in the SIP INVITE request shall reject the request with a SIP 488 (Not Acceptable Here) response. Otherwise, continue with the rest of the steps;

Editor's Note: it is FFS if an audio stream is required in addition to the video stream.

5) shall check if the number of maximum simultaneous MCVideo group calls supported for the MCVideo user as specified in the <MaxSimultaneousCallsN6> element of the <MCVideo-group-call> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) has been exceeded. If exceeded, the participating MCVideo function shall respond with a SIP 486 (Busy Here) response with the warning text set to "103 maximum simultaneous MCVideo group calls reached" in a Warning header field as specified in subclause 4.4. Otherwise, continue with the rest of the steps;

NOTE 3: If the SIP INVITE request contains an emergency indication or an imminent peril indication, the participating MCVideo function can by means beyond the scope of this specification choose to allow for an exception to the limit for the maximum simultaneous MCVideo sessions supported for the MCVideo user. Alternatively, a lower priority session of the MCVideo user could be terminated to allow for the new session.

6) if the user identified by the MCVideo ID is not affiliated to the group identified in the "SIP INVITE request for originating participating MCVideo function" as determined by subclause x.x.x.x and this is an authorised request for originating a priority call as determined by subclause x.x.x.x, shall perform the actions specified in subclause x.x.x.x for implicit affiliation;

7) if the actions for implicit affiliation specified in step 6) above were performed but not successful in affiliating the MCVideo user due to the MCVideo user already having N2 simultaneous affiliations, shall reject the "SIP INVITE request for originating participating MCVideo function" with a SIP 486 (Busy Here) response with the warning text set to "102 too many simultaneous affiliations" in a Warning header field as specified in subclause 4.4. and skip the rest of the steps.

NOTE 4: N2 is the total number of MCVideo groups that an MCVideo user can be affiliated to simultaneously as specified in 3GPP TS 23.281 [26].

NOTE 5: if the SIP INVITE request contains an emergency indication set to a value of "true" or an imminent peril indication set to a value of "true" and this is an authorised request for originating a priority call as determined by subclause x.x.x.x, the participating MCVideo function can according to local policy choose to allow an exception to the N2 limit. Alternatively, a lower priority affiliation of the MCVideo user could be cancelled to allow for the new affiliation.

8) shall determine the public service identity of the controlling MCVideo function associated with the group identity in the SIP INVITE request;

NOTE 6: The public service identity can identify the controlling MCVideo function in the primary MCVideo system or a partner MCVideo system.

NOTE 7: How the participating MCVideo server discovers the public service identity of the controlling MCVideo function associated with the group identity is out of scope of the current release.

9) shall generate a SIP INVITE request as specified in subclause x.x.x.x;

- 10) shall set the Request-URI to the public service identity of the controlling MCVideo function associated with the group identity which was present in the incoming SIP INVITE request;
 - 11) shall not copy the following header fields from the incoming SIP INVITE request to the outgoing SIP INVITE request, if they were present in the incoming SIP INVITE request:
 - a) Answer-Mode header field as specified in IETF RFC 5373 [27]; and
 - b) Priv-Answer-Mode header field as specified in IETF RFC 5373 [27];
 - 12) shall set the <mcvideo-calling-user-identity> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP INVITE request to the MCVideo ID of the calling user;
 - 13) shall include in the SIP INVITE request an SDP offer based on the SDP offer in the received SIP INVITE request from the MCVideo client as specified in subclause x.x.x.x;
 - 14) if the received SIP INVITE request contains an application/vnd.3gpp.location-info+xml MIME body and if not already copied, shall copy the contents of the application/vnd.3gpp.location-info+xml MIME body received in the SIP INVITE request into an application/vnd.3gpp.location-info+xml MIME body included in the outgoing SIP request;
 - 15) if a Resource-Priority header field was included in the received SIP INVITE request, shall include a Resource-Priority header field according to rules and procedures of 3GPP TS 24.229 [11] set to the value indicated in the Resource-Priority header field of the SIP INVITE request from the MCVideo client; and
- NOTE 8: The participating MCVideo function will leave verification of the Resource-Priority header field to the controlling MCVideo function.
- 16) shall forward the SIP INVITE request, according to 3GPP TS 24.229 [11].

Upon receipt of a SIP 302 (Moved Temporarily) response to the above SIP INVITE request in step 15), the participating MCVideo function:

- 1) shall generate a SIP INVITE request as specified in subclause x.x.x.x;
- 2) shall include an SDP offer based upon the SDP offer in the received SIP INVITE request from the MCVideo client as specified in subclause x.x.x.x; and
- 3) shall forward the SIP INVITE request according to 3GPP TS 24.229 [51].

Upon receipt of a SIP 2xx response in response to the above SIP INVITE request in step 15), the participating MCVideo function:

- 1) shall generate a SIP 200 (OK) response as in subclause x.x.x.x;
- 2) shall include in the SIP 200 (OK) response an SDP answer as specified in the subclause x.x.x.x;
- 3) shall include Warning header field(s) that were received in the incoming SIP 200 (OK) response;
- 4) shall include the public service identity received in the P-Asserted-Identity header field of the incoming SIP 200 (OK) response into the P-Asserted-Identity header field of the outgoing SIP 200 (OK) response;
- 5) shall include an MCVideo session identity mapped to the MCVideo session identity provided in the Contact header field of the received SIP 200 (OK) response;
- 6) if the procedures of subclause x.x.x.x for implicit affiliation were performed in the present subclause, shall complete the implicit affiliation by performing the procedures of subclause x.x.x.x;
- 7) shall send the SIP 200 (OK) response to the MCVideo client according to 3GPP TS 24.229 [51];
- 8) shall interact with Media Plane as specified in 3GPP TS 24.581 [5]; and
- 9) shall start the SIP Session timer according to rules and procedures of IETF RFC 4028 [23].

Upon receipt of a SIP 4xx, 5xx or 6xx response to the above SIP INVITE request in step 14) the participating MCVideo function:

- 1) shall generate a SIP response according to 3GPP TS 24.229 [11];
- 2) shall include Warning header field(s) that were received in the incoming SIP response;
- 3) shall forward the SIP response to the MCVideo client according to 3GPP TS 24.229 [11]; and
- 4) if the implicit affiliation procedures of subclause x.x.x.x were invoked in this procedure, shall perform the procedures of subclause x.x.x.x;

9.2.1.3.1.3 Reception of a SIP re-INVITE request from served MCVideo client

This subclause covers both on-demand session.

Upon receipt of a SIP re-INVITE request for an MCVideo session identifying an on-demand prearranged MCVideo group session, the participating MCVideo function:

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP re-INVITE request with a SIP 500 (Server Internal Error) response. The participating MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15] and skip the rest of the steps;

NOTE 1: If the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <emergency-ind> element set to a value of "true", the participating MCVideo function can choose to accept the request.

- 2) shall determine if the media parameters are acceptable and the MCVideo codecs are offered in the SDP offer and if not, reject the request with a SIP 488 (Not Acceptable Here) response. Otherwise, continue with the rest of the steps;
- 3) shall generate an outgoing SIP re-INVITE request as specified in subclause x.x.x.x;
- 4) shall, if the SIP re-INVITE request was received within an on-demand session, include in the SIP re-INVITE request an SDP offer based on the SDP offer in the received SIP re-INVITE request as specified in subclause x.x.x.x;
- 5) shall, if the SIP re-INVITE request was received within a pre-established session, include in the SIP re-INVITE request an SDP offer based upon the previously negotiated SDP for the pre-established session as specified in subclause x.x.x.x;
- 6) if the received SIP re-INVITE request contains a Resource-Priority header field, shall include a Resource-Priority header field with the contents set as in the received Resource-Priority header field; and

NOTE 3: The controlling MCVideo function will determine the validity of the Resource-Priority header field.

- 7) shall forward the SIP re-INVITE request according to 3GPP TS 24.229 [11].

Upon receipt of a SIP 2xx response to the above SIP re-INVITE request in step 7) the participating MCVideo function:

- 1) shall generate a SIP 200 (OK) response as specified in the subclause x.x.x.x;
- 2) shall include in the SIP 200 (OK) response an SDP answer as specified in the subclause x.x.x.x;
- 3) shall include Warning header field(s) that were received in the incoming SIP 200 (OK) response;
- 4) shall copy the contents received in the P-Asserted-Identity header field of the incoming SIP 200 (OK) response into the P-Asserted-Identity header field of the outgoing SIP 200 (OK) response;
- 5) shall send the SIP 200 (OK) response towards the MCVideo client according to 3GPP TS 24.229 [11]; and
- 6) shall interact with the media plane as specified in 3GPP TS 24.581 [5].

Upon receipt of a SIP 403 (Forbidden) response to the above SIP INVITE request in step 7) the participating MCVideo function:

- 1) shall generate a SIP 403 (Forbidden) response according to 3GPP TS 24.229 [11];

- 2) shall copy, if included in the received SIP 403 (Forbidden) response, the application/vnd.3gpp.mcvideo-info+xml MIME body to the outgoing SIP (Forbidden) response;
- 3) shall include Warning header field(s) that were received in the incoming SIP 403 (Forbidden) response;
- 4) shall forward the SIP 403 (Forbidden) response to the MCVideo client according to 3GPP TS 24.229 [11]; and
- 5) shall interact with the media plane as specified in 3GPP TS 24.581 [5].

9.2.1.3.2 Terminating Procedures

In the procedures in this subclause:

- 1) emergency indication in an incoming SIP INVITE request refers to the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body; and
- 2) imminent peril indication in an incoming SIP INVITE request refers to the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body.

NOTE 1: This subclause covers on-demand session.

Upon receipt of a "SIP INVITE request for terminating participating MCVideo function", the participating MCVideo function:

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP INVITE request with a SIP 500 (Server Internal Error) response. The participating MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15], and shall not continue with the rest of the steps;

NOTE 2: if the SIP INVITE request contains an emergency indication or an imminent peril indication set to a value of "true" and this is an authorised request for originating a priority call as determined by subclause x.x.x.x, the participating MCVideo function can according to local policy choose to accept the request.

- 2) shall check the presence of the isfocus media feature tag in the URI of the Contact header field and if it is not present then the participating MCVideo function shall reject the request with a SIP 403 (Forbidden) response with the warning text set to "104 isfocus not assigned" in a Warning header field as specified in subclause x.x.x.x, and shall not continue with the rest of the steps;
- 3) if the Answer-Mode Indication in the application/poc-settings+xml MIME body has not yet been received from the invited MCVideo client as defined in subclause x.x.x.x or subclause x.x.x.x, shall reject the request with a SIP 480 (Temporarily Unavailable) response with the warning text set to "146 T-PF unable to determine the service settings for the called user" in a Warning header field as specified in subclause x.x.x.x, and shall not continue with the rest of the steps;
- 4) shall use the MCVideo ID present in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the incoming SIP INVITE request to retrieve the binding between the MCVideo ID and public user identity;
- 5) if the binding between the MCVideo ID and public user identity does not exist, then the participating MCVideo function shall reject the SIP INVITE request with a SIP 404 (Not Found) response. Otherwise, continue with the rest of the steps;
- 6) if the SIP INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with an <MKFC-GKTPs> element, shall perform the procedures in subclause x.x.x.x;
- 7) shall perform the automatic commencement procedures specified in subclause x.x.x.x and according to IETF RFC 5373 [27] if the "SIP INVITE request for terminating participating MCVideo function" does not contain an Answer-Mode header field and the Answer-Mode Indication received in the application/poc-settings+xml MIME body received from the invited MCVideo client as per subclause x.x.x.x or subclause x.x.x.x is set to "auto-answer"; and
- 8) shall perform the manual commencement procedures specified in subclause x.x.x.x and according to IETF RFC 5373 [27] if the "SIP INVITE request for terminating participating MCVideo function" does not contain an Answer-Mode header field and the Answer-Mode Indication received in the application/poc-

settings+xml MIME body received from the invited MCVideo client as per subclause x.x.x.x or subclause x.x.x.x is set to "manual-answer".

9.2.1.3.3 End group call at the originating participating MCVideo function

9.2.1.3.3.1 Receipt of SIP BYE request for ending group call on-demand

Upon receiving from the MCVideo client a SIP BYE request the participating MCVideo function shall follow the procedures as specified in subclause x.x.x.x.

9.2.1.3.4 End group call at the terminating participating MCVideo function

9.2.1.3.4.1 Receipt of SIP BYE request for private call on-demand

Upon receiving a SIP BYE request from the controlling MCVideo function, the participating MCVideo function shall follow the procedures as specified in subclause x.x.x.x.

9.2.1.3.5 Re-join procedures

9.2.1.3.5.1 Originating procedures - on demand prearranged group call

Upon receipt of a "SIP INVITE request for originating participating MCVideo function" containing an application/vnd.3gpp.mcvideo-info+xml MIME body with the <session-type> element set to a value of "prearranged", the participating MCVideo function shall follow the procedures specified in subclause 9.2.1.3.1.1 with the clarification in step 9) of subclause 9.2.1.3.1.1 that the Request-URI of the SIP INVITE request shall contain a URI of the MCVideo session identity which mapped to the MCVideo session identity provided in Request-URI header field of the "SIP INVITE request for originating participating MCVideo function".

9.2.1.3.6 Reception of a SIP re-INVITE request for terminating MCVideo client for priority call

In the procedures in this subclause:

- 1) emergency indication in an incoming SIP INVITE request refers to the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body; and
- 2) imminent peril indication in an incoming SIP INVITE request refers to the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body.

Upon receipt of a SIP re-INVITE request for a terminating MCVideo client of a MCVideo group containing an emergency indication or imminent peril indication, the participating MCVideo function:

- 1) shall check if a Resource-Priority header field is included in the incoming SIP 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 [11];
- 2) shall generate an outgoing SIP re-INVITE request as specified in subclause x.x.x.x;
- 3) shall include in the SIP re-INVITE request an SDP offer based on the SDP offer in the received SIP re-INVITE request as specified in subclause x.x.x.x; and
- 4) shall send the SIP re-INVITE request towards the MCVideo client according to 3GPP TS 24.229 [11].

Upon receiving a SIP 200 (OK) response to the above SIP re-INVITE request sent to the MCVideo client, the participating MCVideo function:

- 1) shall generate a SIP 200 (OK) response as described in the subclause x.x.x.x;
- 2) shall include in the SIP 200 (OK) response an SDP answer based on the SDP answer in the received SIP 200 (OK) response as specified in subclause x.x.x.x;
- 3) shall interact with the media plane as specified in 3GPP TS 24.581 [5]; and

4) shall forward the SIP 200 (OK) response according to 3GPP TS 24.229 [11].

9.2.1.4 Controlling MCVideo function procedures

Editor's Note: All subclauses x.x.x are not yet specified for MCVideo and need to be added in 24.281, 24.481, 24.484, and 24.581.

9.2.1.4.1 Originating Procedures

9.2.1.4.1.1 INVITE targeted to an MCVideo client

This subclause describes the procedures for inviting an MCVideo user to an MCVideo session. The procedure is initiated by the controlling MCVideo function as the result of an action in subclause 9.2.1.4.2 or as the result of receiving a SIP 403 (Forbidden) response as described in this subclause.

The controlling MCVideo function:

- 1) shall generate a SIP INVITE request as specified in subclause x.x.x;
- 2) shall set the Request-URI to the public service identity of the terminating participating MCVideo function associated to the MCVideo user to be invited.;

NOTE 1: How the controlling MCVideo function finds the address of the terminating MCVideo participating function is out of the scope of the current release.

NOTE 2: If the terminating MCVideo user is part of a partner MCVideo system, then the public service identity can identify an entry point in the partner network that is able to identify the terminating participating MCVideo function.

- 3) shall set the P-Asserted-Identity header field to the public service identity of the controlling MCVideo function;
- 4) shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body in the outgoing SIP INVITE request:
 - a) the <mcvideo-request-uri> element set to the MCVideo ID of the terminating user; and
 - b) the <mcvideo-calling-group-id> element set to the group identity;

NOTE 3: The <mcvideo-calling-user-id> is already included in the MIME body as a result of calling subclause x.x.x in step 1).

- 5) shall include in the SIP INVITE request an SDP offer based on the SDP offer in the received SIP INVITE request from the originating network according to the procedures specified in subclause x.x.x;
- 6) if the in-progress emergency state of the group is set to a value of "true" the controlling MCVideo function:
 - a) shall include a Resource-Priority header field populated with the values for an MCVideo emergency group call as specified in subclause x.x.x;
 - b) if the received SIP INVITE request contained an application/vnd.3gpp.mcvideo-info+xml MIME body with the <emergency-ind> element set to a value of "true":
 - i) shall include in the outgoing SIP INVITE request in the application/vnd.3gpp.mcvideo-info+xml MIME body an <emergency-ind> element set to a value of "true"; and
 - ii) if the <alert-ind> element is set to "true" in the received SIP INVITE request and the requesting MCVideo user and MCVideo group are authorised for the initiation of MCVideo emergency alerts as determined by the procedures of subclause x.x.x, shall populate the application/vnd.3gpp.mcvideo-info+xml MIME body and the application/vnd.3gpp.location-info+xml MIME body as specified in subclause x.x.x. Otherwise, shall set the <alert-ind> element to a value of "false"; and
 - c) if the in-progress imminent peril state of the group is set to a value of "true" shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body an <imminentperil-ind> element set to a value of "false";

- 7) if the in-progress emergency state of the group is set to a value of "false" and the in-progress imminent peril state of the group is set to a value of "true", the controlling MCVideo function:
 - a) shall include a Resource-Priority header field populated with the values for an MCVideo imminent peril group call as specified in subclause x.x.x; and
 - b) shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body with the <imminentperil-ind> element set to a value of "true"; and
- 8) shall send the SIP INVITE request towards the terminating network in accordance with 3GPP TS 24.229 [11].

Upon receiving a SIP 183 (Session Progress) response containing a Require header field with the option tag "100rel" and containing a P-Answer-State header field with the value "Unconfirmed" in response to the SIP INVITE request the controlling MCVideo function:

- 1) shall send a SIP PRACK request towards the MCVideo client according to 3GPP TS 24.229 [11].

Upon receiving a SIP 200 (OK) response for the SIP INVITE request the controlling MCVideo function:

- 1) shall interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x;
- 2) shall send a SIP NOTIFY request to all participants with a subscription to the conference event package as specified in subclause 9.2.3.4; and
- 3) shall increment the local counter of the number of SIP 200 (OK) responses received from invited members, by 1.

NOTE 4: The notifications above could be sent prior to the SIP 200 (OK) response being sent to the inviting MCVideo client. These notifications received by MCVideo clients that are group members do not mean that the group session will be successfully established.

NOTE 5: The procedures executed by the controlling MCVideo function prior to sending a response to the inviting MCVideo client are specified in subclause 9.2.1.4.2.

9.2.1.4.1.2 INVITE targeted to the non-controlling MCVideo function of an MCVideo group

The controlling MCVideo function:

- 1) shall generate a SIP INVITE request as specified in subclause x.x.x;
- 2) shall set the Request-URI to the public service identity of the non-controlling MCVideo function serving the group identity of the MCVideo group owned by the partner MCVideo system;
- 3) shall set the P-Asserted-Identity to the public service identity of the controlling MCVideo function;
- 4) shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body in the outgoing SIP INVITE request:
 - a) the <mcvideo-request-uri> element set to the group identity of the MCVideo group hosted by the non-controlling MCVideo function in the partner MCVideo system; and
 - b) the <mcvideo-calling-group-id> element set to the group identity of the group served by the controlling MCVideo function;
- 5) shall include in the SIP INVITE request an SDP offer based on the SDP offer in the received SIP INVITE request from the originating network according to the procedures specified in subclause x.x.x; and
- 6) shall send the SIP INVITE request towards the partner MCVideo system in accordance with 3GPP TS 24.229 [11].

Upon receiving SIP 403 (Forbidden) response for the SIP INVITE request, if according to local policy and if:

- 1) the response contains a Warning header field with the MCVideo warning code "128"; and
- 2) the response contains a P-Refused-URI-List header field and an application/resource-lists+xml MIME body as specified in IETF RFC 5318 [28];

NOTE 1: The application/resource-lists+xml MIME body contains MCVideo IDs identifying MCVideo users in a partner MCVideo system that needs to be invited to the prearranged group call in case of group regrouping using interrogating method.

Editor's Note: The above note currently isn't defined in the 23.280 and 23.281.

then the controlling MCVideo function:

- 1) shall check if the number of members of the MCVideo group exceeds the value contained in the <on-network-max-participant-count> element of the group document as specified in 3GPP TS 24.481 [24]. If exceeded, the controlling MCVideo function shall invite only <on-network-max-participant-count> members from the application/resource-lists+xml MIME body; and

NOTE 2: The <on-network-max-participant-count> element indicates the maximum number of participants allowed in the prearranged group session. It is operator policy that determines which participants in the application/resource-lists+xml MIME body are invited to the group call.

- 2) shall invite MCVideo users as specified in this subclause using the list of MCVideo IDs in URI-List.

Upon receiving a SIP 200 (OK) response for the SIP INVITE request the controlling MCVideo function:

- 1) shall interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x;

NOTE 3: The procedures executed by the controlling MCVideo function prior to sending a response to the inviting MCVideo client are specified in subclause 9.2.1.4.2.

- 2) if at least one of the invited MCVideo clients has subscribed to the conference package, shall subscribe to the conference event package in the non-controlling MCVideo function as specified in subclause 9.2.3.4.3.

9.2.1.4.2 Terminating Procedures

In the procedures in this subclause:

- 1) MCVideo ID in an incoming SIP INVITE request refers to the MCVideo ID of the originating user from the <mcvideo-calling-user-id> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the incoming SIP INVITE request;
- 2) group identity in an incoming SIP INVITE request refers to the group identity from the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the incoming SIP INVITE request;
- 3) MCVideo ID in an outgoing SIP INVITE request refers to the MCVideo ID of the called user in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the outgoing SIP INVITE request;
- 4) MCVideo ID in an incoming SIP 200 (OK) response refers to the MCVideo ID of the contacted user in the <mcvideo-called-party-id> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the incoming SIP 200 (OK) response;
- 5) indication of required group members in a SIP 183 (Session Progress) response refers to the <required> element of the application/vnd.3gpp.mcvideo-info+xml MIME body set to "true" in a SIP 183 (Session Progress) sent by the non-controlling MCVideo function of an MCVideo group;
- 6) emergency indication in an incoming SIP INVITE request refers to the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body; and
- 7) imminent peril indication in an incoming SIP INVITE request refers to the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body.

Upon receipt of a "SIP INVITE request for controlling MCVideo function of an MCVideo group", the controlling MCVideo function:

Editor's Note: the distinction of different SIP INVITE requests received by the MCVideo function will be specified in another clause of this specification.

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP INVITE request with a SIP 500 (Server Internal Error) response. The controlling MCVideo function may include

a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [51] and skip the rest of the steps;

NOTE 1: if the SIP INVITE request contains an emergency indication or an imminent peril indication set to a value of "true" and this is an authorised request for originating an MCVideo emergency group call as determined by subclause x.x.x, or for originating an MCVideo imminent peril group call as determined by subclause x.x.x, the controlling MCVideo function can according to local policy choose to accept the request.

- 2) shall determine if the media parameters are acceptable and the MCVideo codecs are offered in the SDP offer and if not reject the request with a SIP 488 (Not Acceptable Here) response and skip the rest of the steps;
- 3) shall reject the SIP request with a SIP 403 (Forbidden) response and not process the remaining steps if:
 - a) an Accept-Contact header field does not include the g.3gpp.mcvideo media feature tag; or
 - b) an Accept-Contact header field does not include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo";
- 4) if received SIP INVITE request includes an application/vnd.3gpp.mcvideo-info+xml MIME body with an <emergency-ind> element included or an <imminent-peril> element included, shall validate the request as described in subclause x.x.x;
- 5) shall retrieve the necessary group document(s) from the group management server for the group identity contained in the SIP INVITE request and carry out initial processing as specified in subclause x.x.x;
- 6) if the result of the initial processing in subclause x.x.x was:
 - a) that authorization of the MCVideo ID is required at a non-controlling MCVideo function of an MCVideo group is required, perform the actions in subclause x.x.x and do not continue with the rest of the steps in this subclause; and
 - b) that a SIP 3xx, 4xx, 5xx or 6xx response to the "SIP INVITE request for controlling MCVideo function of an MCVideo group" has been sent, do not continue with the rest of the steps in this subclause;
- 7) shall perform the actions as described in subclause x.x.x;
- 8) shall maintain a local counter of the number of SIP 200 (OK) responses received from invited members and shall initialise this local counter to zero;
- 9) shall determine if an MCVideo group call for the group identity is already ongoing by determining if an MCVideo session identity has already been allocated for the group call and the MCVideo session is active;
- 10) if the SIP INVITE request contains an unauthorised request for an MCVideo emergency group call as determined by subclause x.x.x:
 - a) shall reject the SIP INVITE request with a SIP 403 (Forbidden) response as specified in subclause x.x.x; and
 - b) shall send the SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11] and skip the rest of the steps;
- 11) if the SIP INVITE request contains an unauthorised request for an MCVideo imminent peril group call as determined by subclause x.x.x, shall reject the SIP INVITE request with a SIP 403 (Forbidden) response with the following clarifications:
 - a) shall include in the SIP 403 (Forbidden) response an application/vnd.3gpp.mcvideo-info+xml MIME body as specified in clause F.1 with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <imminent-peril-ind> element set to a value of "false"; and
 - b) shall send the SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11] and skip the rest of the steps;
- 12) if a Resource-Priority header field is included in the SIP INVITE request:
 - a) if the Resource-Priority header field is set to the value indicated for emergency calls and the SIP INVITE request does not contain an authorised request for an MCVideo emergency call as determined in step 8)

above and the in-progress emergency state of the group is set to a value of "false", shall reject the SIP INVITE request with a SIP 403 (Forbidden) response and skip the rest of the steps; or

- b) if the Resource-Priority header field is set to the value indicated for imminent peril calls and the SIP INVITE request does not contain an authorised request for an MCVideo imminent peril call as determined in step 9) above and the in-progress imminent peril state of the group is set to a value of "false", shall reject the SIP INVITE request with a SIP 403 (Forbidden) response and skip the rest of the steps;

13) if the MCVideo group call is not ongoing then:

- a) if:
 - i) the user identified by the MCVideo ID is not affiliated to the group identity contained in the SIP INVITE request as specified in subclause x.x.x;
 - ii) the group identity contained in the SIP INVITE request is not a constituent MCVideo group ID;
 - iii) the received SIP INVITE request does not contain an emergency indication or imminent peril indication;
or
 - iv) the received SIP INVITE request is an authorised request for an MCVideo emergency group call as determined by subclause x.x.x or MCVideo imminent peril group call as determined by steps subclause x.x.x and is determined to not be eligible for implicit affiliation as specified in subclause x.x.x;then shall return a SIP 403 (Forbidden) response with the warning text set to "120 user is not affiliated to this group" in a Warning header field as specified in subclause 4.4, and skip the rest of the steps below;
- b) if the user identified by the MCVideo ID is not authorised to initiate the prearranged group session as specified in subclause x.x.x, shall send a SIP 403 (Forbidden) response with the warning text set to: "119 user is not authorised to initiate the group call" in a Warning header field as specified in subclause 4.4 and skip the rest of the steps below;
- c) if the received SIP INVITE request contains an authorised request for an MCVideo emergency group call as determined by subclause x.x.x or MCVideo imminent peril group call as determined by subclause x.x.x and the MCVideo user is eligible to be implicitly affiliated with the MCVideo group as determined as determined in step 13) a) iv) above, shall perform the implicit affiliation as specified in subclause x.x.x;
- d) shall check if a Resource-Priority header field is included in the incoming SIP INVITE request and may apply any preferential treatment to the SIP request as specified in 3GPP TS 24.229 [11];
- e) shall create a prearranged group session and allocate an MCVideo session identity for the prearranged group call, and shall handle timer TNG3 (group call timer) as specified in subclause x.x.x;
- f) if the group identity in the "SIP INVITE request for controlling MCVideo function of an MCVideo group" is a TGI:
 - i) shall for each of the constituent MCVideo groups homed on the primary MCVideo system:
 - A) if the controlling MCVideo function does not own the MCVideo group identified by the MCVideo group ID, then generate a SIP INVITE request towards the MCVideo server that owns the MCVideo group identity by following the procedures in subclause 9.2.1.4.1.2; and

NOTE 2: The MCVideo server that the SIP INVITE request is sent to acts as a non-controlling MCVideo function;

- B) if the controlling MCVideo function owns the MCVideo group identified by the MCVideo group ID then:
 - I) determine the members to invite to the prearranged MCVideo group call as specified in subclause x.x.x;
 - II) invite each group member determined in step A) above, to the group session, as specified in subclause 9.2.1.4.1.1; and
 - III) interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x; and

- ii) shall for each of the constituent MCVideo groups homed on the partner MCVideo system generate a SIP INVITE request for the MCVideo group identity homed on the partner MCVideo system as specified in subclause 9.2.1.4.1.2; and
- g) if the group identity in the SIP INVITE request for controlling MCVideo function of an MCVideo group is an MCVideo group ID:
 - i) shall determine the members to invite to the prearranged MCVideo group call as specified in subclause x.x.x;
 - ii) if necessary, shall start timer TNG1 (acknowledged call setup timer) according to the conditions stated in subclause x.x.x;
 - iii) if the received SIP INVITE request includes an application/vnd.3gpp.mcvideo-info+xml MIME body with an <emergency-ind> element set to a value of "true":
 - A) shall cache the information that this MCVideo user has initiated an MCVideo emergency call;
 - B) if the received SIP INVITE contains an alert indication set to a value of "true" and this is an authorised request for an MCVideo emergency alert meeting the conditions specified in subclause x.x.x, shall cache the information that this MCVideo user has initiated an MCVideo emergency alert; and
 - C) if the in-progress emergency state of the group is set to a value of "false":
 - I) shall set the value of the in-progress emergency state of the group to "true"; and
 - II) shall start timer TNG2 (in-progress emergency group call timer) and handle its expiry as specified in subclause x.x.x;
 - iv) if the in-progress emergency state of the group is set to a value of "false" and if the received SIP INVITE request contains an imminent peril indication set to a value of "true", the controlling MCVideo function shall:
 - A) shall cache the information that this MCVideo user has initiated an MCVideo imminent peril call; and
 - B) if the in-progress imminent peril state of the group is set to a value of "false", shall set the in-progress imminent peril state of the group to a value of "true";
 - v) shall invite each group member determined in step i) above, to the group session, as specified in subclause 9.2.1.4.1.1; and
 - vi) shall interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x; and
- 14) if the MCVideo group call is ongoing then:
 - a) if:
 - i) the user identified by the MCVideo ID in the SIP INVITE request is not affiliated to the group identity contained in the SIP INVITE request as specified in subclause x.x.x;
 - ii) the group identity contained in the SIP INVITE request is not a constituent MCVideo group ID;
 - iii) the received SIP INVITE request does not contain an emergency indication or imminent peril indication; or
 - iv) the received SIP INVITE request is an authorised request for an MCVideo emergency group call as determined by subclause x.x.x or MCVideo imminent peril group call as determined subclause x.x.x and is determined to not be eligible for implicit affiliation as specified in subclause x.x.x;then shall return a SIP 403 (Forbidden) response with the warning text set to "120 user is not affiliated to this group" in a Warning header field as specified in subclause 4.4, and skip the rest of the steps below;
 - b) if the user identified by the MCVideo ID in the SIP INVITE request is not authorised to join the prearranged group session as specified in subclause x.x.x, shall send a SIP 403 (Forbidden) response with the warning

text set to "121 user is not allowed to join the group call" in a Warning header field as specified in subclause 4.4 and skip the rest of the steps below;

- c) shall check if a Resource-Priority header field is included in the incoming SIP INVITE request and may apply any preferential treatment to the SIP request as specified in 3GPP TS 24.229 [11];
- d) if <on-network-max-participant-count> as specified in 3GPP TS 24.481 [24] is already reached:
 - i) if, according to local policy, the user identified by the MCVideo ID in the SIP INVITE request is deemed to have a higher priority than an existing user in the group session, may remove a participant from the session by following subclause 9.2.1.4.4.3, and skip the next step; and

NOTE 3: The local policy for deciding whether to admit a user to a call that has reached its maximum amount of participants can include the <user-priority> and the <participant-type> of the user as well as other information of the user from the group document as specified in 3GPP TS 24.481 [24]. The local policy decisions can also include taking into account whether the imminent-peril indicator or emergency indicator was received in the SIP INVITE request.

- ii) shall return a SIP 486 (Busy Here) response with the warning text set to "122 too many participants" to the originating network as specified in subclause 4.4 and skip the rest of the steps;
- e) if the received SIP INVITE request contains an authorised request for an MCVideo emergency group call as determined by subclause x.x.x or MCVideo imminent peril group call as determined by subclause x.x.x and the MCVideo user is eligible to be implicitly affiliated with the MCVideo group as determined in step 14) a) iv) above, shall perform the implicit affiliation as specified in subclause x.x.x;
- f) if the received SIP INVITE request includes an application/vnd.3gpp.mcvideo-info+xml MIME body with an <emergency-ind> element set to a value of "true":
 - i) shall cache the information that this MCVideo user has initiated an MCVideo emergency call;
 - ii) if the received SIP INVITE contains an alert indication set to a value of "true" and this is an authorised request for an MCVideo emergency alert meeting the conditions specified in subclause x.x.x, shall cache the information that this MCVideo user has initiated an MCVideo emergency alert;
 - iii) if the in-progress emergency state of the group is set to a value of "false":
 - A) shall set the value of the in-progress emergency state of the group to "true";
 - B) shall start timer TNG2 (in-progress emergency group call timer) and handle its expiry as specified in subclause x.x.x; and
 - C) shall generate SIP re-INVITE requests for the MCVideo emergency group call to the other call participants of the MCVideo group as specified in subclause x.x.x;
 - iv) if the in-progress imminent peril state of the group is set to a value of "true":
 - A) for each of the other affiliated member of the group generate a SIP MESSAGE request notification of the MCVideo user's imminent peril indication as specified in subclause x.x.x, setting the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "true"; and
 - B) send the SIP MESSAGE request as specified in 3GPP TS 24.229 [11]; and
 - v) upon receiving a SIP 200 (OK) response to the SIP re-INVITE request the controlling MCVideo function shall interact with the media plane as specified in 3GPP TS 24.581 [51];
- g) if the in-progress emergency state of the group is set to a value of "false" and if the SIP INVITE request contains an imminent peril indication set to a value of "true", the controlling MCVideo function:
 - i) shall cache the information that this MCVideo user has initiated an MCVideo imminent peril call; and
 - ii) if the in-progress imminent peril state of the group is set to a value of "false":
 - A) shall set the in-progress imminent peril state of the group to a value of "true";

- B) shall generate SIP re-INVITE requests for the MCVideo imminent peril group call to the other call participants of the MCVideo group as specified in subclause x.x.x; and
 - C) upon receiving a SIP 200 (OK) response to the SIP re-INVITE request the controlling MCVideo function shall interact with the media plane as specified in 3GPP TS 24.581 [5]; and
- iii) if the in-progress imminent peril state of the group is set to a value of "true":
- A) for each of the other affiliated member of the group generate a SIP MESSAGE request notification of the MCVideo user's imminent peril indication as specified in subclause x.x.x, setting the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "true"; and
 - B) send the SIP MESSAGE request as specified in 3GPP TS 24.229 [11];
- h) shall generate a SIP 200 (OK) response as specified in the subclause x.x.x;
 - i) shall include in the SIP 200 (OK) response an SDP answer to the SDP offer in the incoming SIP INVITE request as specified in the subclause x.x.x;
 - j) shall include in the SIP 200 (OK) response with the warning text set to "123 MCVideo session already exists" as specified in subclause 4.4;
 - k) if the received SIP re-INVITE request contains an alert indication set to a value of "true" and this is an unauthorised request for an MCVideo emergency alert as specified in subclause x.x.x, shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;
 - l) if the received SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <imminentperil-ind> element set to a value of "true" and if the in-progress emergency state of the group is set to a value of "true", shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;

NOTE 4: In this case, the request was for an imminent peril call but a higher priority MCVideo emergency call was already in progress on the group. Hence, the imminent peril call request aspect of the request is denied but the request is granted with emergency level priority.

- m) shall interact with media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x;

NOTE 5: Resulting media plane processing is completed before the next step is performed.

- n) shall send the SIP 200 (OK) response towards the inviting MCVideo client or inviting non-controlling MCVideo function according to 3GPP TS 24.229 [11];
- o) shall generate a notification to the MCVideo clients, which have subscribed to the conference state event package that the inviting MCVideo User has joined in the MCVideo group session, as specified in subclause x.x.x;

NOTE 6: As a group document can potentially have a large content, the controlling MCVideo function can notify using content-indirection as defined in IETF RFC 4483 [29].

- p) shall send a SIP NOTIFY request to each MCVideo client according to 3GPP TS 24.229 [11];
- q) Upon receiving a SIP ACK to the above SIP 200 (OK) response and the SIP 200 (OK) response contained the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4, shall follow the procedures in subclause x.x.x; and
- r) shall not continue with the rest of the subclause.

Upon receiving a SIP 183 (Session Progress) response to the SIP INVITE request specified in subclause 9.2.1.4.1 containing a P-Answer-State header field with the value "Unconfirmed" as specified in IETF RFC 4964 [30], the timer TNG1 (acknowledged call setup timer) is not running, the controlling MCVideo function supports media buffering and the SIP final response is not yet sent to the inviting MCVideo client:

- 1) shall generate a SIP 200 (OK) response to SIP INVITE request as specified in the subclause x.x.x;

- 2) shall include the warning text set to "122 too many participants" as specified in subclause 4.4 in the SIP 200 (OK) response, if the prearranged MCVideo group has more than <on-network-max-participant-count> members as specified in 3GPP TS 24.481 [24];
- 3) shall include in the SIP 200 (OK) response an SDP answer to the SDP offer in the incoming SIP INVITE request as specified in the subclause x.x.x;
- 4) shall include a P-Answer-State header field with the value "Unconfirmed";
- 5) if the SIP INVITE request contains an alert indication set to a value of "true" and this is an unauthorised request for an MCVideo emergency alert as specified in subclause x.x.x, shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;
- 6) if the received SIP INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <imminentperil-ind> element set to a value of "true" and if the in-progress emergency state of the group is set to a value of "true", shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;
- 7) shall interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x;

NOTE 7: Resulting user plane processing is completed before the next step is performed.

- 8) shall send the SIP 200 (OK) response towards the inviting MCVideo client according to 3GPP TS 24.229 [11];
- 9) shall generate a notification to the MCVideo clients, which have subscribed to the conference state event package that the inviting MCVideo User has joined in the MCVideo group session, as specified in subclause x.x.x; and

NOTE 8: As a group document can potentially have a large content, the controlling MCVideo function can notify using content-indirection as defined in IETF RFC 4483 [29].

- 10) shall send a SIP NOTIFY request to each MCVideo client according to 3GPP TS 24.229 [11].

Upon receiving a SIP 183 (Session Progress) response for a SIP INVITE request as specified in subclause 9.2.1.4.1.2 containing an indication of required group members, the timer TNG1 (acknowledged call setup timer) is running and all SIP 200 (OK) responses have been received to all SIP INVITE requests sent to MCVideo clients specified in subclause 9.2.1.4.1.1, then the controlling MCVideo function shall wait until the SIP 200 (OK) response has been received to the SIP INVITE request specified in subclause 9.2.1.4.1.2 before generating a SIP 200 (OK) response to the "SIP INVITE request for controlling MCVideo function of an MCVideo group".

Upon receiving a SIP 200 (OK) response for a SIP INVITE request as specified in subclause 9.2.1.4.1 that was sent to an affiliated and <on-network-required> group member as specified in 3GPP TS 24.481 [24]; and

- 1) if the MCVideo ID in the SIP 200 (OK) response matches to the MCVideo ID in the corresponding SIP INVITE request;
- 2) there are no outstanding SIP 200 (OK) responses to SIP INVITE requests which were sent to affiliated and <on-network-required> group members as specified in 3GPP TS 24.481 [24]; and
- 3) there is no outstanding SIP 200 (OK) response to a SIP INVITE request sent in subclause 9.2.1.4.1.2 where the SIP 183 (Session Progress) response contained an indication of required group members;

the controlling MCVideo function:

- 1) shall stop timer TNG1 (acknowledged call setup timer) as described in subclause x.x.x;
- 2) shall generate SIP 200 (OK) response to the SIP INVITE request as specified in the subclause x.x.x before continuing with the rest of the steps;
- 3) shall include the warning text set to "122 too many participants" as specified in subclause 4.4 in the SIP 200 (OK) response, if all members were not invited because the prearranged MCVideo group has been exceeded the <on-network-max-participant-count> members as specified in 3GPP TS 24.481 [24];
- 4) shall include in the SIP 200 (OK) response an SDP answer to the SDP offer in the incoming SIP INVITE request as specified in the subclause x.x.x;

5) shall interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x;

NOTE 9: Resulting media plane processing is completed before the next step is performed.

6) shall send a SIP 200 (OK) response to the inviting MCVideo client according to 3GPP TS 24.229 [11];

7) shall generate a notification to the MCVideo clients, which have subscribed to the conference state event package that the inviting MCVideo user has joined in the MCVideo group session, as specified in subclause x.x.x; and

NOTE 10: As a group document can potentially have a large content, the controlling MCVideo function can notify using content-indirection as defined in IETF RFC 4483 [29].

8) shall send the SIP NOTIFY request to the MCVideo clients according to 3GPP TS 24.229 [11].

Upon:

1) receiving a SIP 200 (OK) response for a SIP INVITE request as specified in subclause 9.2.1.4.1;

2) the timer TNG1 (acknowledged call setup timer) is not running;

Editor's Note: timers need to be defined.

3) the local counter of the number of SIP 200 (OK) responses received from invited members is equal to the value of the <on-network-minimum-number-to-start> element of the group document;

4) the controlling MCVideo function supports media buffering; and

5) the SIP final response has not yet been sent to the inviting MCVideo client;

the controlling MCVideo function according to local policy:

1) shall generate SIP 200 (OK) response to the SIP INVITE request as specified in the subclause x.x.x;

2) shall include the warning text set to "122 too many participants" as specified in subclause 4.4 in the SIP 200 (OK) response, if all members were not invited because the prearranged MCVideo group has exceeded the <max-participant-count> members as specified in 3GPP TS 24.481 [24];

3) shall include in the SIP 200 (OK) response an SDP answer to the SDP offer in the incoming SIP INVITE request as specified in the subclause x.x.x;

4) if the SIP INVITE request contains an alert indication set to a value of "true" and this is an unauthorised request for an MCVideo emergency alert as specified in subclause x.x.x, shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;

5) if the received SIP INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <imminentperil-ind> element set to a value of "true" and if the in-progress emergency state of the group is set to a value of "true", shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;

6) shall interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x;

NOTE 11: Resulting media plane processing is completed before the next step is performed.

7) shall send a SIP 200 (OK) response to the inviting MCVideo client according to 3GPP TS 24.229 [11];

8) shall generate a notification to the MCVideo clients, which have subscribed to the conference state event package that the inviting MCVideo user has joined in the MCVideo group session, as specified in subclause x.x.x; and

NOTE 12: As a group document can potentially have a large content, the controlling MCVideo function can notify using content-indirection as defined in IETF RFC 4483 [29].

9) shall send the SIP NOTIFY request to the MCVideo clients according to 3GPP TS 24.229 [11].

Upon expiry of timer TNG1 (acknowledged call setup timer), if there are outstanding SIP 200 (OK) responses to SIP INVITE requests sent to affiliated and <on-network-required> group members as specified in 3GPP TS 24.481 [24], the controlling MCVideo function shall follow the procedures specified in subclause x.x.x.

If timer TNG1 (acknowledged call setup timer) is running and a final SIP 4xx, 5xx or 6xx response is received from an affiliated and <on-network-required> group member as specified in 3GPP TS 24.481 [24], the controlling MCVideo function shall follow the relevant procedures specified in subclause x.x.x.

If:

- 1) timer TNG1 (acknowledged call setup timer) is not running;
- 2) the local counter of the number of SIP 200 (OK) responses received from invited members is equal to the value of the <on-network-minimum-number-to-start> element of the group document; and
- 3) a final SIP 4xx, 5xx or 6xx response is received from an invited MCVideo client;

then the controlling MCVideo function shall perform one of the following based on policy:

- 1) send the SIP final response towards the inviting MCVideo client, according to 3GPP TS 24.229 [11], if a SIP final response was received from all the other invited MCVideo clients and the SIP 200 (OK) response is not yet sent; or
- 2) remove the invited MCVideo client from the MCVideo Session as specified in subclause x.x.x, if a SIP final response other than 2xx or 3xx was received from all the invited MCVideo clients and the SIP 200 (OK) response is already sent. the controlling MCVideo function may invite an additional member of the prearranged MCVideo group as specified in subclause 9.2.1.4.1 that has not already been invited, if the prearranged MCVideo group has more than <on-network-max-participant-count> members as specified in 3GPP TS 24.481 [24], and all members have not yet been invited.

Upon receiving a SIP ACK to the SIP 200 (OK) response sent towards the inviting MCVideo client, and the SIP 200 (OK) response was sent with the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4, the controlling MCVideo function shall follow the procedures in subclause x.x.x.

9.2.1.4.3 End group call at the terminating controlling MCVideo function

Upon receiving a SIP BYE request the controlling MCVideo function shall follow the procedures as specified in subclause x.x.x.

9.2.1.4.4 End group call initiated by the controlling MCVideo function

9.2.1.4.4.1 General

This subclause describes the procedures of each functional entity for ending the group call initiated by the controlling MCVideo function.

9.2.1.4.4.2 SIP BYE request for releasing MCVideo session for a group call

When the MCVideo session for group call needs to be released as specified in subclause x.x.x, the controlling MCVideo function shall follow the procedures in subclause x.x.x.

9.2.1.4.4.3 SIP BYE request toward a MCVideo client

When an MCVideo client needs to be removed from the MCVideo session (e.g. due to de-affiliation or admitting a higher priority user), the controlling MCVideo function shall follow the procedures in subclause x.x.x.

After successful removing the MCVideo client from the MCVideo session, the controlling MCVideo function may generate a notification to the MCVideo clients, which have subscribed to the conference state event package that an MCVideo user has been removed from the MCVideo session, as specified in subclause x.x.x and send the SIP NOTIFY request to the MCVideo client according to 3GPP TS 24.229 [11].

9.2.1.4.5 Re-join procedures

9.2.1.4.5.1 Terminating procedures

Upon receipt of a SIP INVITE request that includes an MCVideo session identity of an ongoing MCVideo session in the Request-URI the controlling MCVideo function:

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP INVITE request with a SIP 500 (Server Internal Error) response. The controlling MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15]. Otherwise, continue with the rest of the steps;

NOTE 1: if the SIP INVITE request contains an emergency indication or an imminent peril indication set to a value of "true" and this is an authorised request for originating an MCVideo emergency group call as determined by subclause x.x.x, or for originating an MCVideo imminent peril group call as determined by subclause x.x.x, the controlling MCVideo function can according to local policy choose to accept the request.

- 2) shall reject the SIP request with a SIP 404 (Not Found) response if the MCVideo group call represented by the MCVideo session identity in Request-URI header is not present;
- 3) shall determine if the media parameters are acceptable and the MCVideo codecs are offered in the SDP offer and if not, reject the request with a SIP 488 (Not Acceptable Here) response. Otherwise, continue with the rest of the steps;
- 4) shall reject the SIP request with a SIP 403 (Forbidden) response and not process the remaining steps if:
 - a) an Accept-Contact header field does not include the g.3gpp.mcvideo media feature tag; or
 - b) an Accept-Contact header field does not include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo";
- 5) shall determine the MCVideo ID of the calling user;
- 6) if the user identified by the MCVideo ID is not authorised to join the prearranged group session as specified in subclause x.x.x, shall send a SIP 403 (Forbidden) response with the warning text set to "121 user is not authorised to join the group call" in a Warning header field as specified in subclause 4.4. Otherwise continue with the rest of the steps below;
- 7) shall perform the actions on receipt of an initial SIP INVITE request as described in subclause x.x.x;
- 8) if the user identified by the MCVideo ID is not affiliated to the MCVideo group ID associated with the MCVideo session identity as specified in subclause x.x.x, shall return a SIP 403 (Forbidden) response with the warning text set to "120 user is not affiliated to this group" in a Warning header field as specified in subclause 4.4;
- 9) shall check if a Resource-Priority header field is included in the incoming SIP INVITE request and may apply any preferential treatment to the SIP request as specified in 3GPP TS 24.229 [11];
- 10) if <on-network-max-participant-count> as specified in 3GPP TS 24.481 [24] is already reached:
 - a) if, according to local policy, the user identified by the MCVideo ID in the SIP INVITE request is deemed to have a higher priority than an existing user in the group session, may remove a participant from the session by following subclause 9.2.1.4.4.3, and skip the next step; and

NOTE 2: The local policy for deciding whether to admit a user to a call that has reached its maximum amount of participants can include the <user-priority> and the <participant-type> of the user as well as other information of the user from the group document as specified in 3GPP TS 24.481 [24]. The local policy decisions can also include taking into account whether the imminent-peril indicator or emergency indicator was received in the SIP INVITE request.

- b) shall return a SIP 486 (Busy Here) response with the warning text set to "122 too many participants" to the originating network as specified in subclause 4.4. Otherwise, continue with the rest of the steps;
- 11) shall generate a SIP 200 (OK) response as specified in the subclause x.x.x;

12) shall include in the SIP 200 (OK) response an SDP answer to the SDP offer in the incoming SIP INVITE request as specified in the subclause x.x.x;

13) shall interact with media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x;

NOTE 3: Resulting media plane processing is completed before the next step is performed.

14) shall send the SIP 200 (OK) response towards the inviting MCVideo client according to 3GPP TS 24.229 [11];

15) shall generate a notification to the MCVideo clients, which have subscribed to the conference state event package that the inviting MCVideo User has joined in the MCVideo group session, as specified in subclause x.x.x; and

NOTE 4: As a group document can potentially have a large content, the controlling MCVideo function can notify using content-indirection as defined in IETF RFC 4483 [29].

16) shall send a SIP NOTIFY request to each MCVideo client according to 3GPP TS 24.229 [11].

9.2.1.4.6 Late call entry initiated by controlling MCVideo function

When controlling MCVideo function is notified that an MCVideo client is newly affiliated or comes back from out of coverage, the controlling MCVideo function shall invite the MCVideo client to join an ongoing MCVideo group call by following the procedures specified in subclause 9.2.1.4.1.

NOTE: How the MCVideo function is informed when an MCVideo client is coming back from out of coverage is out of scope of present document.

9.2.1.4.7 Receipt of a SIP re-INVITE request

In the procedures in this subclause:

- 1) emergency indication in an incoming SIP INVITE request refers to the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body; and
- 2) imminent peril indication in an incoming SIP INVITE request refers to the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body.

Upon receipt of a SIP re-INVITE request for an MCVideo session identity identifying an on-demand prearranged MCVideo group session, the controlling MCVideo function:

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP re-INVITE request with a SIP 500 (Server Internal Error) response. The controlling MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15] and skip the rest of the steps;

NOTE 1: If the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <emergency-ind> element set to a value of "true", the controlling MCVideo function can choose to accept the request.

- 2) if received SIP re-INVITE request includes an application/vnd.3gpp.mcvideo-info+xml MIME body with an <emergency-ind> element included or an <imminent-peril> element included, shall validate the request as described in subclause x.x.x;
- 3) if the received SIP re-INVITE request contains an unauthorised request for an MCVideo emergency call as determined by subclause x.x.x:
 - a) shall reject the SIP re-INVITE request with a SIP 403 (Forbidden) response as specified in subclause x.x.x; and
 - b) shall send the SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11] and skip the rest of the steps;
- 4) if the received SIP re-INVITE request contains an imminent peril indication set to "true" for an MCVideo imminent peril group call and this is an unauthorised request for an MCVideo imminent peril group call as

determined by subclause x.x.x, shall reject the SIP re-INVITE request with a SIP 403 (Forbidden) response with the following clarifications:

- a) shall include in the SIP 403 (Forbidden) response an application/vnd.3gpp.mcvideo-info+xml MIME body as specified in clause F.1 with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <imminentperil-ind> element set to a value of "false"; and
 - b) shall send the SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11] and skip the rest of the steps;
- 5) if a Resource-Priority header field is included in the received SIP re-INVITE request:
- a) if the Resource-Priority header field is set to the value indicated for emergency calls and the SIP re-INVITE request does not contain an authorised request for an MCVideo emergency call as determined in step 2) above and the in-progress emergency state of the group is set to a value of "false", shall reject the SIP re-INVITE request with a SIP 403 (Forbidden) response and skip the rest of the steps; and
 - b) if the Resource-Priority header field is set to the value indicated for imminent peril calls and the SIP re-INVITE request does not contain an authorised request for an MCVideo imminent peril call as determined in step 3) above and the in-progress imminent peril state of the group is set to a value of "false", shall reject the SIP INVITE request with a SIP 403 (Forbidden) response and skip the rest of the steps;
- 6) if the received SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <emergency-ind> element set to a value of "true" and is an authorised request to initiate an MCVideo emergency group call as determined by subclause x.x.x, the controlling MCVideo function shall:
- i) shall cache the MCVideo ID of the MCVideo user that has initiated an MCVideo emergency call;
 - ii) if the received SIP INVITE contains an alert indication set to a value of "true" and this is an authorised request for an MCVideo emergency alert meeting the conditions specified in subclause x.x.x, shall cache the MCVideo ID of the MCVideo user that has initiated an MCVideo emergency alert;
 - iii) if the in-progress emergency state of the group is set to a value of "true":
 - A) for each of the other affiliated member of the group generate a SIP MESSAGE request notification of the MCVideo user's emergency indication as specified in subclause x.x.x, setting the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "true";
 - B) send the SIP MESSAGE request as specified in 3GPP TS 24.229 [11]; and
 - C) if the in-progress imminent peril state of the group is set to a value of "true", shall set it to a value of "false"; and
 - iv) if the in-progress emergency state of the group is set to a value of "false":
 - A) shall set the value of the in-progress emergency state of the group to "true";
 - B) shall start timer TNG2 (in-progress emergency group call timer) and handle its expiry as specified in subclause x.x.x;
- NOTE 2: The interactions of TNG2 with the TNG3 (group call timer) are explained in subclause x.x.x.
- Editor's Note: timers need to be defined..
- C) shall generate SIP re-INVITE requests for the MCVideo emergency group call to the other participants of the MCVideo group call as specified in subclause x.x.x;
 - D) shall send the SIP re-INVITEs towards the other participants of the MCVideo group call; and
 - E) upon receiving a SIP 200 (OK) response to the SIP re-INVITE request the controlling MCVideo function shall interact with the media plane as specified in 3GPP TS 24.581 [5];
- 7) if the received SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <emergency-ind> element set to a value of "false" and is an unauthorised request for an MCVideo emergency group call cancellation as determined by subclause x.x.x:

- a) shall reject the SIP re-INVITE request with a SIP 403 (Forbidden) response;
 - b) shall include in the SIP 403 (Forbidden) response an application/vnd.3gpp.mcvideo-info+xml MIME body as specified in annex F.1 with an <emergency-ind> element set to a value of "true";
 - c) if an <alert-ind> element of the mcvideoinfo MIME body is included in the SIP re-INVITE request set to "false", and there is an outstanding MCVideo emergency alert for this MCVideo user, shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body and <alert-ind> element set to a value of "true"; and
 - d) shall send the SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11] and skip the rest of the steps;
- 8) if the received SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <emergency-ind> element set to a value of "false" and is determined to be an authorised request for an MCVideo emergency call cancellation as specified in subclause x.x.x and the in-progress emergency state of the group to is set to a value of "true" the controlling MCVideo function:
- a) shall set the in-progress emergency group state of the group to a value of "false";
 - b) shall clear the cache of the MCVideo ID of the MCVideo user as having an outstanding MCVideo emergency group call;
 - c) if an <alert-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body is included and set to "false" and is determined to be an authorised request for an MCVideo emergency alert cancellation as specified in subclause x.x.x and there is an outstanding MCVideo emergency alert for this MCVideo user shall:
 - i) if the received SIP re-INVITE request contains an <originated-by> element in the application/vnd.3gpp.mcvideo-info+xml MIME body, clear the cache of the MCVideo ID of the MCVideo user identified by the <originated-by> element as having an outstanding MCVideo emergency alert; or
 - ii) if the received SIP re-INVITE request does not contain an <originated-by> element in the application/vnd.3gpp.mcvideo-info+xml MIME body, clear the cache of the MCVideo ID of the sender of the SIP re-INVITE request as having an outstanding MCVideo emergency alert;
 - d) shall generate SIP re-INVITE requests to the participants in the group call as specified in subclause x.x.x. The MCVideo controlling function:
 - i) for each of the other participants in the group call shall send the SIP re-INVITE request towards the MCVideo client as specified in 3GPP TS 24.229 [11]; and
 - ii) Upon receiving a SIP 200 (OK) response to the SIP re-INVITE request the controlling MCVideo function shall interact with the media plane as specified in 3GPP TS 24.581 [5];

NOTE 3: Subclause x.x.x will inform the group call participants of the cancellation of the MCVideo group's in-progress emergency state and the cancellation of the MCVideo emergency alert if applicable.

- e) shall stop timer TNG2 (in-progress emergency group call timer); and

NOTE 4: The interactions of TNG2 with the TNG3 (group call timer) are explained in subclause x.x.x;

- f) for each of the affiliated members of the group that are not participating in the call:
 - i) generate a SIP MESSAGE request notification of the cancellation of the MCVideo user's emergency call as specified in subclause x.x.x;
 - ii) set the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "false";
 - iii) if indicated above in step 7) c), set the <alert-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "false"; and
 - iv) send the SIP MESSAGE request according to 3GPP TS 24.229 [11];

- 9) if the received SIP re-INVITE request contains an imminent peril indication and the in-progress emergency group state of the group is set to a value of "false", shall perform the procedures specified in subclause 9.2.1.4.8 and skip the rest of the steps.

Upon receiving a SIP 200 (OK) response to a SIP re-INVITE request the controlling MCVideo function shall interact with the media plane as specified in 3GPP TS 24.581 [5];

- 1) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [11];
- 2) shall include in the SIP 200 (OK) response an SDP answer according to 3GPP TS 24.229 [11] with the clarifications specified in subclause x.x.x;
- 3) shall include the "norefersub" option tag in a Supported header field according to IETF RFC 4488 [31];
- 4) shall include the "tdialog" option tag in a Supported header field according to IETF RFC 4538 [32];
- 5) if the received SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <alert-ind> element set to a value of "true" and if this is an unauthorised request for an MCVideo emergency alert as determined by subclause x.x.x, shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;
- 6) if the received SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <alert-ind> element set to a value of "false" and if this is an unauthorised request for an MCVideo emergency alert cancellation as determined by subclause x.x.x, shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;
- 7) if the received SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <imminentperil-ind> element set to a value of "true", this is an authorised request for an MCVideo imminent peril group call and the in-progress emergency state of the group is set to a value of "true", shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;

NOTE 5: In this case, the request was for an imminent peril call but a higher priority MCVideo emergency call was already in progress on the group. Hence, the imminent peril call request aspect of the request is denied but the request is granted with emergency level priority.

- 8) shall interact with media plane as specified in 3GPP TS 24.581 [5]; and
- 9) shall send the SIP 200 (OK) response towards the MCVideo client according to 3GPP TS 24.229 [11].

Upon receiving a SIP ACK to the SIP 200 (OK) response sent towards the inviting MCVideo client, and the SIP 200 (OK) response was sent with the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4, the controlling MCVideo function shall follow the procedures in subclause x.x.x.

Upon receipt of a SIP 2xx response for an outgoing SIP MESSAGE request, shall handle according to 3GPP TS 24.229 [11].

9.2.1.4.8 Handling of a SIP re-INVITE request for imminent peril session

This procedure is initiated by the controlling MCVideo function as the result of an action in subclause 9.2.1.4.7.

In the procedures in this subclause:

- 1) imminent peril indication in an incoming SIP INVITE request refers to the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body.

When the controlling function receives a SIP re-INVITE request with an imminent peril indication set to "true", the controlling function:

- 1) if the in-progress emergency state of the group is set to a value of "false" and if the SIP INVITE request contains an imminent peril indication set to a value of "true" or the in-progress imminent peril state of the group to "true", the controlling MCVideo function shall:

NOTE: 1 The calling procedure has already determined that this is not an unauthorised request for an MCVideo imminent peril call, therefore that check does not need to be repeated in the current procedure.

- a) if the in-progress imminent peril state of the group is set to a value of "true" and this MCVideo user is indicating a new imminent peril indication:
 - i) for each of the other affiliated member of the group generate a SIP MESSAGE request notification of the MCVideo user's imminent peril indication as specified in subclause x.x.x with the following clarifications:
 - A) set the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "true"; and
 - B) send the SIP MESSAGE request as specified in 3GPP TS 24.229 [11];
 - b) if the in-progress imminent peril state of the group is set to a value of "false";
 - i) set the value of the in-progress imminent peril state of the group to "true";
 - ii) generate SIP re-INVITE requests for the MCVideo imminent peril group call to participants in the MCVideo group call as specified in subclause x.x.x;
 - iii) send the SIP re-INVITES to all of the other participants in the MCVideo group call;
 - iv) for each of the affiliated members of the group not participating in the group call, generate a SIP MESSAGE request notification of the MCVideo user's imminent peril indication as specified in subclause x.x.x with the following clarifications:
 - A) set the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "true"; and
 - B) send the SIP MESSAGE request as specified in 3GPP TS 24.229 [11]; and
 - c) cache the information that this MCVideo user has initiated an MCVideo imminent peril call;
- 2) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <imminentperil-ind> element set to a value of "false" and is an unauthorised request for an MCVideo imminent peril group call cancellation as determined by subclause x.x.x shall:
- a) reject the SIP re-INVITE request with a SIP 403 (Forbidden) response to the SIP re-INVITE request; and
 - b) include in the SIP 403 (Forbidden) response an application/vnd.3gpp.mcvideo-info+xml MIME body as specified in Annex F.1 with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <imminentperil-ind> element set to a value of "false";
 - c) send the SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11]; and
 - d) skip the rest of the steps;
- 3) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <imminentperil-ind> element set to a value of "false" and is determined to be an authorised request for an MCVideo imminent peril call cancellation as specified in subclause x.x.x and the in-progress imminent peril state of the group to is set to a value of "true" the controlling MCVideo function shall:
- a) set the in-progress imminent peril state of the group to a value of "false";
 - b) cache the information that this MCVideo user no longer has an outstanding MCVideo imminent peril group call;
 - c) generate SIP re-INVITES requests to the other participants in the MCVideo group call as specified in subclause x.x.x. The MCVideo controlling function:
 - i) for each participant shall send the SIP re-INVITE request towards the MCVideo client as specified in 3GPP TS 24.229 [11]; and
 - ii) Upon receiving a SIP 200 (OK) response to the SIP re-INVITE request the controlling MCVideo function interact with the media plane as specified in 3GPP TS 24.581 [5]; and

NOTE 2: Subclause x.x.x will inform the affiliated and joined members of the cancellation of the MCVideo group's in-progress emergency state and the cancellation of the MCVideo emergency alert if applicable.

- d) for each of the affiliated members of the group not participating in the call shall:
 - i) generate a SIP MESSAGE request notification of the cancellation of the MCVideo user's imminent peril call as specified in subclause x.x.x;
 - ii) set the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "false"; and
 - iii) send the SIP MESSAGE request according to 3GPP TS 24.229 [11];
- 4) shall include in the SIP 200 (OK) response an SDP answer according to 3GPP TS 24.229 [11] with the clarifications specified in subclause x.x.x;
- 5) shall include the "norefersub" option tag in a Supported header field according to IETF RFC 4488 [31];
- 6) shall include the "tdialog" option tag in a Supported header field according to IETF RFC 4538 [32];
- 7) shall interact with media plane as specified in 3GPP TS 24.581 [5]; and
- 8) shall send the SIP 200 (OK) response towards the MCVideo client according to 3GPP TS 24.229 [11].

Upon receipt of a SIP 2xx response for an outgoing SIP MESSAGE request, shall handle according to 3GPP TS 24.229 [11].

9.2.1.5 Non-controlling function of an MCVideo group procedures

Editor's Note: All subclauses x.x.x are not yet specified for MCVideo and need to be added in 24.281, 24.481, 24.484, and 24.581.

9.2.1.5.1 Originating procedures

This subclause describes the procedures for inviting an MCVideo user to an MCVideo session. The procedure is initiated by the non-controlling MCVideo function of an MCVideo group as the result of an action in subclause 9.2.1.5.2 or subclause 9.2.1.5.5.

The non-controlling MCVideo function:

- 1) shall invite the MCVideo clients as specified in subclause x.x.x;
- 2) shall include in each SIP INVITE request an SDP offer based on the SDP offer in the received SIP INVITE request from the controlling MCVideo function according to the procedures specified in subclause x.x.x; and
- 3) shall send each SIP INVITE request towards the terminating network in accordance with 3GPP TS 24.229 [11].

For each SIP 183 (Session Progress) response received to each SIP INVITE request sent to an MCVideo client, the non-controlling MCVideo function of an MCVideo group:

- 1) For each SIP 183 (Session Progress) response containing the option tag "100rel", shall send a SIP PRACK request towards the MCVideo client according to 3GPP TS 24.229 [11]; and
- 2) shall cache the received response;

For each SIP 200 (OK) response received to each SIP INVITE request sent to an MCVideo client, the non-controlling MCVideo function of an MCVideo group:

- 1) shall cache the SIP 200 (OK) response;
- 2) shall start the SIP session timer according to rules and procedures of IETF RFC 4028 [23]; and
- 3) if at least one of the participants has subscribed to the conference event package, shall send a SIP NOTIFY request to all participants with a subscription to the conference event package as specified in subclause 9.2.3.5.2.

On receipt of a SIP 3xx, 4xx, 5xx or 6xx response from an invited MCVideo client, the non-controlling MCVideo function of an MCVideo group:

- 1) shall send an SIP ACK request towards the MCVideo client as specified in 3GPP TS 24.229 [11];

- 2) shall remove the cached provisional responses received from the MCVideo client, if any cached provisional responses exists; and
- 3) if the procedures are initiated by the receipt of the "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" as specified in subclause 9.2.1.5.2, shall cache the SIP 3xx, 4xx, 5xx or 6xx response.

9.2.1.5.2 Terminating procedures

9.2.1.5.2.1 General

When receiving the "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" the MCVideo server can be acting as a controller MCVideo function in an ongoing prearranged group call or, if an prearranged group call is not ongoing, be initiated as a non-controlling MCVideo function and invite MCVideo users.

If a prearranged group call is not ongoing the MCVideo server shall perform the actions specified in subclause 9.2.1.5.2.2.

If the "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" is received when a prearranged group call is ongoing, the controlling MCVideo function may switch from operating in a controlling MCVideo function mode to operate in a non-controlling MCVideo function mode as specified in subclause 9.2.1.5.2.3.

When operating in the non-controlling mode and a SIP BYE request is received from the controlling MCVideo function, the non-controlling MCVideo function shall change from operating in the non-controlling mode to operating in the controlling mode as specified in subclause 9.2.1.5.2.4.

9.2.1.5.2.2 Initiating a prearranged group call

Upon receipt of a "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" and if a prearranged group call is not ongoing, the non-controlling MCVideo function of an MCVideo group:

NOTE 1: The Contact header field of the SIP INVITE request contains the "isfocus" feature media tag.

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP INVITE request with a SIP 500 (Server Internal Error) response. The controlling MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15]. Otherwise, continue with the rest of the steps;
- 2) shall determine if the media parameters are acceptable and the MCVideo codecs are offered in the SDP offer and if not reject the request with a SIP 488 (Not Acceptable Here) response. Otherwise, continue with the rest of the steps;
- 3) shall reject the SIP request with a SIP 403 (Forbidden) response and not process the remaining steps if:
 - a) an Accept-Contact header field does not include the g.3gpp.mcvideo media feature tag; or
 - b) an Accept-Contact header field does not include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo";
- 4) if the partner MCVideo system does not have a mutual aid relationship with the primary MCVideo system identified by the contents of the P-Asserted-Identity, shall reject the "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" with a SIP 403 (Forbidden) response, with warning text set to "128 isfocus already assigned" in a Warning header field as specified in subclause 4.4, and shall not process the remaining steps;
- 6) shall retrieve the group document from the group management server for the MCVideo group ID contained in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP INVITE request and carry out initial processing as specified in subclause x.x.x and continue with the rest of the steps if the checks in subclause x.x.x succeed;
- 7) shall cache the content of the SIP INVITE request, if received in the Contact header field and if the specific feature tags are supported;

- 8) shall check if a Resource-Priority header field is included in the incoming SIP INVITE request and may apply any preferential treatment to the SIP request as specified in 3GPP TS 24.229 [11];
- 9) determine the members to invite to the prearranged MCVideo group call as specified in subclause x.x.x;
- 10) if the group document retrieved from the group management server contains <on-network-required> group members as specified in 3GPP TS 24.481 [24], shall send a SIP 183 (Session Progress) response to the SIP INVITE request for non-controlling MCVideo function of an MCVideo group as specified in subclause x.x.x and shall populate the response with an application/vnd.3gpp.mcvideo-info+xml MIME body containing the <required> element set to "true".
- 11) if the group document retrieved from the group management server does not contain any <on-network-required> group members as specified in 3GPP TS 24.481 [24], may, according to local policy, send a SIP 183 (Session Progress) response to the SIP INVITE request for non-controlling MCVideo function of an MCVideo group as specified in subclause x.x.x;
- 12) shall invite each group member determined in step 9) above, to the group session, as specified in subclause 9.2.1.5.1; and
- 13) shall interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x;

Unless a SIP response has been sent to the controlling MCVideo function as specified in step 10 or 11 above, the non-controlling MCVideo function of an MCVideo group shall wait for the first SIP provisional response or first SIP 200 (OK) response from one of the invited MCVideo clients, before sending a response to the SIP INVITE request for non-controlling MCVideo function of an MCVideo group.

Upon receiving the first 18x response to a SIP INVITE request sent to an invited MCVideo client as specified in subclause 9.2.1.5.1, not containing a P-Answer-State header field, and if a SIP 183 (Session Progress) response has not already been sent in response to the SIP INVITE request for non-controlling MCVideo function of an MCVideo group, the non-controlling MCVideo function of an MCVideo group:

- 1) shall generate a SIP 183 (Session Progress) response as described in subclause x.x.x; and
- 2) shall forward the SIP 183 (Session Progress) response to the controlling MCVideo function according to 3GPP TS 24.229 [11].

Upon receiving the first 18x response to a SIP INVITE request sent to an invited MCVideo client as specified in subclause 9.2.1.5.1, containing a P-Answer-State header field with the value "Unconfirmed" as specified in IETF RFC 4964 [30], a SIP 183 (Session Progress) response has not already been sent in response to the SIP INVITE request for non-controlling MCVideo function of an MCVideo group and the non-controlling MCVideo function of an MCVideo group supports media buffering, the non-controlling MCVideo function of an MCVideo group:

- 1) shall generate SIP 200 (OK) response to the SIP INVITE request as specified in the subclause x.x.x before continuing with the rest of the steps;
- 2) shall include in the SIP 200 (OK) response an SDP answer to the SDP offer in the incoming SIP INVITE request as specified in the subclause x.x.x;
- 3) shall interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x; and

NOTE 2: Resulting media plane processing is completed before the next step is performed.

- 4) shall send a SIP 200 (OK) response to the controlling MCVideo function according to 3GPP TS 24.229 [11].

If the group document does not contain any <on-network-required> group members as specified in 3GPP TS 24.481 [51], then upon receiving the first SIP 200 (OK) response to a SIP INVITE request sent to an invited MCVideo client as specified in subclause 9.2.1.5.1, the non-controlling MCVideo function of an MCVideo group:

- 1) shall generate SIP 200 (OK) response to the SIP INVITE request as specified in the subclause x.x.x before continuing with the rest of the steps;
- 2) shall include in the SIP 200 (OK) response an SDP answer to the SDP offer in the incoming SIP INVITE request as specified in the subclause x.x.x;
- 3) shall interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x; and

NOTE 3: Resulting media plane processing is completed before the next step is performed.

- 4) shall send a SIP 200 (OK) response to the controlling MCVideo function according to 3GPP TS 24.229 [11];

If the group document contains <on-network-required> group member(s) as specified in 3GPP TS 24.481 [24], then the non-controlling MCVideo function of an MCVideo group shall wait until all SIP 200 (OK) responses to SIP INVITE requests have been received from the <on-network-required> MCVideo clients before sending a SIP 200 (OK) response back to the controlling MCVideo function, as specified above.

If all invited MCVideo clients have rejected SIP INVITE requests with a SIP 3xx, 4xx, 5xx or 6xx response, the non-controlling MCVideo function of an MCVideo group:

- 1) shall generate a SIP reject response as specified in 3GPP TS 24.229 [11];
- 2) shall, from the list of reject response codes cached by the non-controlling MCVideo function of an MCVideo group, select the highest prioritized cached reject response code as specified in IETF RFC 3261 [15]; and
- 3) shall send the reject response towards the controlling MCVideo function as specified in 3GPP TS 24.229 [11].

9.2.1.5.2.3 Joining an ongoing prearranged group call

Upon receipt of a "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" and if a prearranged group call is already ongoing, the non-controlling MCVideo function of an MCVideo group:

NOTE 1: The Contact header field of the SIP INVITE request contains the "isfocus" feature media tag.

- 1) shall determine if the media parameters are acceptable and the MCVideo codecs are offered in the SDP offer and if not, reject the request with a SIP 488 (Not Acceptable Here) response. Otherwise, continue with the rest of the steps;
- 2) shall reject the SIP request with a SIP 403 (Forbidden) response and not process the remaining steps if:
 - a) an Accept-Contact header field does not include the g.3gpp.mcvideo media feature tag; or
 - b) an Accept-Contact header field does not include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo";
- 3) if the partner MCVideo system does not have a mutual aid relationship to merged an ongoing prearranged call with the primary MCVideo system identified by the contents of the P-Asserted-Identity, shall reject the "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" with a SIP 403 (Forbidden) response, with warning text set to "128 isfocus already assigned" in a Warning header field as specified in subclause 4.4, and shall not process the remaining steps;
- 4) shall cache the content of the SIP INVITE request, if received in the Contact header field and if the specific feature tags are supported;
- 5) shall check if a Resource-Priority header field is included in the incoming SIP INVITE request and may apply any preferential treatment to the SIP request as specified in 3GPP TS 24.229 [11];
- 6) shall generate SIP 200 (OK) response to the SIP INVITE request as specified in the subclause x.x.x before continuing with the rest of the steps;
- 7) shall include in the SIP 200 (OK) response an SDP answer to the SDP offer in the incoming SIP INVITE request as specified in the subclause x.x.x;

Editor's Note: Interactions with the media plane are FFS

- 8) shall send a SIP 200 (OK) response to the controlling MCVideo function according to 3GPP TS 24.229 [11]; and
- 9) if at least one of the MCVideo clients in the pre-arranged group session has a subscription to the conference event package, shall subscribe to the conference event package from the controlling MCVideo function as specified in subclause 9.2.3.5.3.

9.2.1.5.2.4 Splitting an ongoing prearranged group call

Upon receipt of a SIP BYE request or a final SIP reject response from the controlling MCVideo function, the non-controlling MCVideo function of an MCVideo group:

- 1) if keeping the prearranged group call active is according to the release policy in subclause x.x.x, shall request media plane to switch to controlling mode as specified in 3GPP TS 24.581 [5] subclause x.x.x;

NOTE 1: Resulting media plane processing is completed before the next step is performed.

- 2) if a SIP BYE request was received, shall send a SIP 200 (OK) response to the SIP BYE request; and
- 3) if keeping the prearranged group call active is according to the release policy in subclause x.x.x and if at least one of the remaining MCVideo clients has subscribed to the conference package, shall send a NOTIFY request to all participants with a subscription to the conference event package as specified in subclause 9.2.3.5.2.

NOTE 2: The SIP NOTIFY request will indicate that all participants, with the exception of the MCVideo users belonging to the constituent MCVideo group hosted by the non-controlling MCVideo function, have left the group session.

9.2.1.5.3 Rejoin procedures

9.2.1.5.3.1 Terminating procedures

Upon receipt of a SIP INVITE request that includes an MCVideo session identity of an ongoing MCVideo session in the Request-URI the non-controlling MCVideo function act as a controlling MCVideo function towards the MCVideo client and shall perform the actions in the subclause 9.2.1.4.5.1 with the following clarifications:

- 1) the MCVideo session identity in the Contact header field of the SIP 200 (OK) response shall be the MCVideo session identity generated by the non-controlling MCVideo function; and
- 2) the subclause 9.2.3.5.2 shall be used when sending the SIP NOTIFY request for subscriptions to the conference event package.

9.2.1.5.3.2 Late call entry initiated by non-controlling MCVideo function

When non-controlling MCVideo function is notified that an MCVideo client is newly affiliated or comes back from out of coverage, the non-controlling MCVideo function shall invite the MCVideo client to join an ongoing MCVideo group call by following the procedures specified in subclause 9.2.1.5.1.

NOTE: How the MCVideo function is informed when an MCVideo client is coming back from out of coverage is out of scope of present document.

9.2.1.5.4 SIP OPTIONS request authorization procedure

Upon receipt of an SIP OPTIONS request containing a P-Asserted-Identity header field containing the public service identity of a MCVideo server not authorized to send the SIP OPTIONS request, the non-controlling MCVideo function of an MCVideo group shall send a SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11] and exit this subclause.

Upon receipt of an SIP OPTIONS request containing a P-Asserted-Identity header field containing the public service identity of a MCVideo server authorized to send the SIP OPTIONS request, the non-controlling MCVideo function of an MCVideo group shall perform the actions in this subclause.

The non-controlling MCVideo function shall retrieve the group document from the group management server for the MCVideo group ID contained in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP OPTIONS request with the following clarifications:

NOTE: The action of the non-controlling MCVideo function of an MCVideo group on receipt of the SIP OPTIONS request mimics the actions of the non-controlling MCVideo function of an MCVideo group on receipt of the SIP INVITE request.

The non-controlling MCVideo function shall:

- 1) if the non-controlling MCVideo function fails to retrieve the group document from the group management server, send a shall send the SIP 404 (Not Found) response to the SIP OPTIONS request with the warning text set to "113 group document does not exist" in a Warning header field as specified in subclause 4.4;
- 2) if the non-controlling MCVideo function successfully retrieves the group document from the group management server or if the group document was already cached and if one of the following conditions are fulfilled:
 - a) if the constituent MCVideo group is a chat group and the rules for joining a group conference as specified in subclause x.x.x are fulfilled; or
 - b) if the constituent MCVideo group is a prearranged group and the rules for initiating a prearranged group session as specified in subclause x.x.x;

then the non-controlling MCVideo function:

- a) shall send the SIP 200 (OK) response to the SIP OTIONS response as specified in 3GPP TS 24.229 [11] and the IETF RFC 3261 [15] populated as follows:
 - i) shall include a warning text set to "147 user is authorized to initiate a temporary group call" in a Warning header field as specified in subclause 4.4;
 - ii) shall include an application/vnd.3gpp.mcvideo-info MIME body with:
 - A) the <session-type> element set to "chat", if the constituent MCVideo group is a chat group; and
 - B) the <session-type> element set to "prearranged", if the constituent MCVideo group is a prearranged group; and
 - iii) shall include the P-Asserted-Identity of the non-controlling MCVideo function of an MCVideo group; and
- 3) if none of the conditions in step 2 above) are fulfilled, shall send a SIP 403 (Forbidden) response with the warning text set to "119 user is not authorised to initiate the group call" in a Warning header field as specified in subclause 4.4.

9.2.1.5.5 Initiating a temporary group session

Upon receiving a "SIP INVITE request "SIP INVITE request for controlling MCVideo function of an MCVideo group" when a prearranged group session is not ongoing, the non-controlling MCVideo-function shall:

NOTE 1: The difference between a "SIP INVITE request "SIP INVITE request for controlling MCVideo function of an MCVideo group" and a "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" is that the latter SIP INVITE request contains the isfocus media feature tag in the Contact header field.

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP INVITE request with a SIP 500 (Server Internal Error) response. The non-controlling MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15]. Otherwise, continue with the rest of the steps;
- 2) shall determine if the media parameters are acceptable and the MCVideo codecs are offered in the SDP offer and if not reject the request with a SIP 488 (Not Acceptable Here) response. Otherwise, continue with the rest of the steps;
- 3) shall reject the SIP request with a SIP 403 (Forbidden) response and not process the remaining steps if:
 - a) an Accept-Contact header field does not include the g.3gpp.mcvideo media feature tag; or
 - b) an Accept-Contact header field does not include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo";
- 4) shall retrieve the group document from the group management server for the MCVideo group ID contained in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP INVITE request and carry out initial processing as specified in subclause x.x.x and continue with the rest of the steps if the checks in subclause x.x.x succeed;

NOTE 2: If the checks are not successful, the SIP response to the "SIP INVITE request "SIP INVITE request for controlling MCVideo function of an MCVideo group" is already sent in the subclause x.x.x.

- 5) shall cache the content of the SIP INVITE request;
- 6) shall check if a Resource-Priority header field is included in the incoming SIP INVITE request and may apply any preferential treatment to the SIP request as specified in 3GPP TS 24.229 [11];
- 7) shall authorize the MCVideo user in the <mcvideo-calling-user-identity> element in the application/vnd.3gpp.mcvideo-info+xml MIME body of the "SIP INVITE request for controlling MCVideo function of an MCVideo group" as specified in subclause x.x.x, if the MCVideo user is unauthorized to initiate a pre-arranged group session the non-controlling MCVideo function shall send a SIP 403 (Forbidden) response with the warning text set to "119 user is not authorised to initiate the group call" in a Warning header field as specified in subclause 4.4.
- 8) shall generate a SIP INVITE request to the controlling MCVideo function as specified in subclause x.x.x; and
- 9) shall send the SIP INVITE request to the controlling MCVideo function as specified in 3GPP TS 24.229 [11].

Upon receipt of a SIP 2xx response to the SIP INVITE request sent to the controlling MCVideo function as specified above, the non-controlling MCVideo function:

- 1) shall send the SIP ACK request to the controlling MCVideo function as specified in 3GPP TS 24.229 [11];
- 2) shall generate a SIP 200 (OK) to the "SIP INVITE request for controlling MCVideo function of an MCVideo group" as specified in 3GPP TS 24.229 [11] populated as follows:
 - a) shall include an SDP answer as specified in subclause x.x.x based on the SDP answer in the SIP 200 (OK) response;
 - b) shall include the public service identifier of the non-controlling MCVideo function in the P-Asserted-Identity header field; and
 - c) shall include the warning text set to "148 MCVideo group is regrouped" in a Warning header field as specified in subclause 4.4;
- 3) shall start acting as a non-controlling MCVideo function and interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x;
- 4) shall determine the members to invite to the prearranged MCVideo group call as specified in subclause x.x.x; and
- 5) shall invite each group member determined in step 2) above, to the group session, as specified in subclause 9.2.1.5.1.

Upon receipt of other final SIP responses with the exception of the SIP 2xx response to the INVITE request sent to the controlling MCVideo function as specified above, the non-controlling MCVideo function:

- 1) shall send the SIP ACK response to the controlling MCVideo function as specified in 3GPP TS 24.229 [11]; and
- 2) shall start acting as a controlling MCVideo function as specified in subclause 9.2.1.4 and invite members as specified in subclause x.x.x.

NOTE 4: Regardless if the controlling MCVideo function accepts or rejects the SIP INVITE request sent above the prearranged group session continues to be initiated with only the members of the group homed on the non-controlling MCVideo function of the group being invited to the group call.

The non-controlling MCVideo function shall handle SIP responses (other than the SIP 2xx response) to the SIP INVITE requests sent to invited members as specified in 3GPP TS 24.229 [11].

Upon receipt of a SIP 2xx response to SIP INVITE requests sent to invited members, the non-controlling MCVideo function:

- 1) shall send the SIP ACK request as specified in 3GPP TS 24.229 [11]; and
- 2) shall interact with the media plane as specified in 3GPP TS 24.581 [5].

9.2.2 Chat group (restricted) call

9.2.2.1 General

9.2.2.2 MCVideo client procedures

Editor's Note: All subclauses x.x.x are not yet specified for MCVideo and need to be added in 24.281, 24.481, 24.484, and 24.581.

9.2.2.2.1 On-demand chat group call

9.2.2.2.1.1 MCVideo client joins a chat MCVideo group session

Upon receiving a request from an MCVideo user to establish an MCVideo group session using an MCVideo group identity, identifying a chat MCVideo group, the MCVideo client shall generate an initial SIP INVITE request by following the UE originating session procedures specified in 3GPP TS 24.229 [11], with the clarifications given below.

The MCVideo client:

- 1) if the MCVideo user has requested the origination of an MCVideo emergency group call or is originating an MCVideo chat group call and the MCVideo emergency state is already set, the MCVideo client shall comply with the procedures in subclause x.x.x.x;
- 2) if the MCVideo user has requested the origination of an MCVideo imminent peril group call, the MCVideo client shall comply with the procedures in subclause x.x.x.x;
- 3) shall include the g.3gpp.mcvideo media feature tag and the g.3gpp.icsi-ref media feature tag with the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo" in the Contact header field of the SIP INVITE request according to IETF RFC 3840 [22];
- 4) shall include an Accept-Contact header field containing the g.3gpp.mcvideo media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [20];
- 5) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcvideo" (coded as specified in 3GPP TS 24.229 [11]), in a P-Preferred-Service header field according to IETF RFC 6050 [14] in the SIP INVITE request;
- 6) 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.mcvideo" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [20];
- 7) should include the "timer" option tag in the Supported header field;
- 8) should include the Session-Expires header field according to IETF RFC 4028 [23]. It is recommended that the refresher parameter is omitted. If included, the refresher parameter shall be set to "uac";
- 9) shall set the Request-URI of the SIP INVITE request to the public service identity identifying the participating MCVideo function serving the MCVideo user;

NOTE 1: The MCVideo client is configured with public service identity identifying the participating MCVideo function serving the MCVideo user.

- 10) 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 [11];
- 11) if the MCVideo emergency state is already set or the MCVideo client emergency group state for this group is set to "MEG 2: in-progress", the MCVideo client shall comply with the procedures in subclause x.x.x.x;
- 12) if the MCVideo client imminent peril group state for this group is set to "MIG 2: in-progress" or "MIG 3: confirm-pending" shall include the Resource-Priority header field and comply with the procedures in subclause x.x.x.x;

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

- a) the <session-type> element set to a value of "chat";
- b) the <mcvideo-request-uri> element set to the group identity; and
- c) the <mcvideo-client-id> element set to the MCVideo client ID of the originating MCVideo client;

NOTE 2: The MCVideo ID of the originating MCVideo user is not included in the body, as this will be inserted into the body of the SIP INVITE request that is sent by the originating participating MCVideo function.

14) shall include in the SIP INVITE request an SDP offer according to 3GPP TS 24.229 [11] with the clarifications specified in subclause x.x.x.x; and

16) shall send the SIP INVITE request according to 3GPP TS 24.229 [11].

On receiving a SIP 2xx response to the SIP INVITE request, the MCVideo client:

- 1) shall interact with the user plane as specified in 3GPP TS 24.581 [5]; and
- 2) if the MCVideo emergency group call state is set to "MEGC 2: emergency-call-requested" or "MEGC 3: emergency-call-granted" or the MCVideo imminent peril group call state is set to "MIGC 2: imminent-peril-call-requested" or "MIGC 3: imminent-peril-call-granted", the MCVideo client shall perform the actions specified in subclause x.x.x.x.

Editor's Note: group call states need to be renamed specific for MCVideo and to be made different to the call states for MCPTT.

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

- 1) if the MCVideo emergency group call state is set to "MEGC 2: emergency-call-requested" or "MEGC 3: emergency-call-granted"; or
- 2) if the MCVideo imminent peril group call state is set to "MIGC 2: imminent-peril-call-requested" or "MIGC 3: imminent-peril-call-granted";

the MCVideo client shall perform the actions specified in subclause x.x.x.x.

On receiving a SIP INFO request where the Request-URI contains an MCVideo session ID identifying an ongoing group session, the MCVideo client shall follow the actions specified in subclause x.x.x.x.

9.2.2.2.1.2 MCVideo client receives SIP re-INVITE request

This subclause covers both on-demand session and pre-established sessions.

Upon receipt of a SIP re-INVITE request the MCVideo client:

- 1) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <emergency-ind> element set to a value of "true":
 - a) should display to the MCVideo user the MCVideo ID of the originator of the MCVideo emergency group call and an indication that this is an MCVideo emergency group call;
 - b) if the <mcvideoinfo> element containing the <mcvideo-Params> element contains an <alert-ind> element set to "true", should display to the MCVideo user an indication of the MCVideo emergency alert and associated information;
 - c) shall set the MCVideo emergency group state to "MEG 2: in-progress"; and
 - d) shall set the MCVideo imminent peril group state to "MIG 1: no-imminent-peril"; otherwise
- 2) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <imminentperil-ind> element set to a value of "true":

- a) should display to the MCVideo user the MCVideo ID of the originator of the MCVideo imminent peril group call and an indication that this is an MCVideo imminent peril group call; and
 - b) shall set the MCVideo imminent peril group state to "MIG 2: in-progress";
- 3) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <emergency-ind> element set to a value of "false":
- a) should display to the MCVideo user the MCVideo ID of the MCVideo user cancelling the MCVideo emergency group call;
 - b) if the <mcvideoinfo> element containing the <mcvideo-Params> element contains an <alert-ind> element set to "false":
 - i) should display to the MCVideo user an indication of the MCVideo emergency alert cancellation and the MCVideo ID of the MCVideo user cancelling the MCVideo emergency alert; and
 - ii) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body including an <originated-by> element:
 - A) should display to the MCVideo user the MCVideo ID contained in the <originated-by> element of the MCVideo user that originated the MCVideo emergency alert; and
 - B) if the MCVideo ID contained in the <originated-by> element is the MCVideo ID of the receiving MCVideo user, shall set the MCVideo emergency alert state to "MEA 1: no-alert";
 - c) shall set the MCVideo emergency group state to "MEG 1: no-emergency"; and
 - d) if the MCVideo emergency group call state of the group is set to "MEGC 3: emergency-call-granted", shall set the MCVideo emergency group call state of the group to "MEGC 1: emergency-gc-capable";
- 4) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <imminentperil-ind> element set to a value of "false":
- a) should display to the MCVideo user the MCVideo ID of the MCVideo user cancelling the MCVideo imminent peril group call and an indication that this is an MCVideo imminent peril group call; and
 - b) shall set the MCVideo imminent peril group state to "MIG 1: no-imminent-peril";
- 5) may 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 [11];
- 6) shall accept the SIP re-INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [11];
- 7) shall include the g.3gpp.mcvideo media feature tag in the Contact header field of the SIP 200 (OK) response;
- 8) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo" in the Contact header field of the SIP 200 (OK) response;
- 9) if the SIP re-INVITE request was received within an on-demand session, 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 [11] with the clarifications given in subclause x.x.x.x;
- 10) shall send the SIP 200 (OK) response towards the MCVideo server according to rules and procedures of 3GPP TS 24.229 [11].

9.2.2.2.1.3 MCVideo in-progress emergency cancel

This subclause covers both on-demand session.

Upon receiving a request from an MCVideo user to cancel the in-progress emergency condition on a chat MCVideo group, the MCVideo client shall generate a SIP re-INVITE request as specified in 3GPP TS 24.229 [11], with the clarifications given below.

The MCVideo client:

- 1) if the MCVideo user is not authorised to cancel the in-progress emergency group state of the MCVideo group as determined by the procedures of subclause x.x.x.x, the MCVideo client:
 - a) should indicate to the MCVideo user that they are not authorised to cancel the in-progress emergency group state of the MCVideo group; and
 - b) shall skip the remaining steps of the current subclause;
- 2) shall, if the MCVideo user is cancelling an in-progress emergency condition and optionally an MCVideo emergency alert originated by the MCVideo user, include an application/vnd.3gpp.mcvideo-info+xml MIME body populated as specified in subclause x.x.x.x;
- 3) shall, if the MCVideo user is cancelling an in-progress emergency condition and optionally an MCVideo emergency alert originated by another MCVideo user, include an application/vnd.3gpp.mcvideo-info+xml MIME body populated as specified in subclause x.x.x.x;
- 4) shall, if the SIP re-INVITE request is to be sent within an on-demand session, include in the SIP re-INVITE request an SDP offer according to 3GPP TS 24.229 [51] with the clarifications specified in subclause x.x.x.x;
- 5) shall include a Resource-Priority header field and comply with the procedures in subclause x.x.x.x; and
- 6) shall send the SIP re-INVITE request according to 3GPP TS 24.229 [11].

On receiving a SIP 2xx response to the SIP re-INVITE request, the MCVideo client:

- 1) shall set the MCVideo emergency group state of the group to "MEG 1: no-emergency";
- 2) shall set the MCVideo emergency group call state of the group to "MEGC 1: emergency-gc-capable"; and
- 3) if the MCVideo emergency alert state is set to "MEA 4: Emergency-alert-cancel-pending", the sent SIP re-INVITE request did not contain an <originated-by> element in the application/vnd.3gpp.mcvideo-info+xml MIME body and the SIP 2xx response to the SIP request for a priority group call does not contain a Warning header field as specified in subclause 4.4 with the warning text containing the mcvideo-warn-code set to "149", shall set the MCVideo emergency alert state to "MEA 1: no-alert".

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

- 1) shall set the MCVideo emergency group state as "MEG 2: in-progress";
- 2) if the SIP 4xx response, SIP 5xx response or SIP 6xx response contains an application/vnd.3gpp.mcvideo-info+xml MIME body with an <alert-ind> element set to a value of "true" and the sent SIP re-INVITE request did not contain an <originated-by> element in the application/vnd.3gpp.mcvideo-info+xml MIME body, the MCVideo client shall set the MCVideo emergency alert state to "MEA 3: emergency-alert-initiated"; and
- 3) if the SIP 4xx response, SIP 5xx response or SIP 6xx response did not contain an application/vnd.3gpp.mcvideo-info+xml MIME body with an <alert-ind> element and did not contain an <originated-by> element, the MCVideo emergency alert (MEA) state shall revert to its value prior to entering the current procedure.

NOTE 3: If the in-progress emergency group state cancel request is rejected, the state of the session does not change, i.e. continues with MCVideo emergency group call level priority.

On receiving a SIP INFO request where the Request-URI contains an MCVideo session ID identifying an ongoing group session, the MCVideo client shall follow the actions specified in subclause x.x.x.x.

9.2.2.2.1.4 MCVideo upgrade to in-progress emergency or imminent peril

This subclause covers both on-demand session.

Upon receiving a request from an MCVideo user to upgrade the MCVideo group session to an emergency condition or an imminent peril condition on a chat MCVideo group, the MCVideo client shall generate a SIP re-INVITE request as specified in 3GPP TS 24.229 [11], with the clarifications given below.

- 1) if the MCVideo user is requesting to upgrade the MCVideo group session to an in-progress emergency group state and is not authorised to do so as determined by the procedures of subclause x.x.x.x, the MCVideo client:
 - a) should indicate to the MCVideo user that they are not authorised to upgrade the MCVideo group session to an in-progress emergency group state; and
 - b) shall skip the remaining steps of the current subclause;
 - 2) if the MCVideo user is requesting to upgrade the MCVideo group session to an in-progress imminent peril state and is not authorised to do so as determined by the procedures of subclause x.x.x.x, the MCVideo client:
 - a) should indicate to the MCVideo user that they are not authorised to upgrade the MCVideo group session to an in-progress imminent peril group state; and
 - b) shall skip the remaining steps of the current subclause;
 - 3) if the MCVideo user has requested to upgrade the MCVideo group session to an MCVideo emergency call, the MCVideo client:
 - a) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body populated as specified in subclause x.x.x.x;
 - b) if an indication of an MCVideo emergency alert is to be included, shall perform the procedures specified in subclause x.x.x.x for the MCVideo emergency alert trigger; and
 - c) shall include a Resource-Priority header field and comply with the procedures in subclause x.x.x.x.
 - 4) if the MCVideo user has requested to upgrade the MCVideo group session to an MCVideo imminent peril call, the MCVideo client:
 - a) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body populated as specified in subclause x.x.x.x; and
 - b) shall include a Resource-Priority header field and comply with the procedures in subclause x.x.x.x;
 - 5) if the SIP re-INVITE request is to be sent within an on-demand session, shall include in the SIP re-INVITE request an SDP offer according to 3GPP TS 24.229 [11] with the clarifications specified in subclause x.x.x.x;
- Editor's Note: interactions with the media plane are FFS**
- 7) shall include a Resource-Priority header field and comply with the procedures in subclause x.x.x.x; and
 - 8) shall send the SIP re-INVITE request according to 3GPP TS 24.229 [11].

On receiving a SIP 2xx response to the SIP re-INVITE request the MCVideo client:

- 1) shall interact with the user plane as specified in 3GPP TS 24.581 [5]; and
- 2) shall perform the actions specified in subclause x.x.x.x.

On receiving a SIP 4xx response, SIP 5xx response or SIP 6xx response to the SIP re-INVITE request the MCVideo client shall perform the actions specified in subclause x.x.x.x.

On receiving a SIP INFO request where the Request-URI contains an MCVideo session ID identifying an ongoing group session, the MCVideo client shall follow the actions specified in subclause x.x.x.x.

9.2.2.2.1.5 MCVideo in-progress imminent peril cancel

This subclause covers both on-demand session.

Upon receiving a request from an MCVideo user to cancel the in-progress imminent peril condition on a chat MCVideo group, the MCVideo client shall generate a SIP re-INVITE request by following the procedures specified in 3GPP TS 24.229 [11], with the clarifications given below.

The MCVideo client:

- 1) if the MCVideo user is not authorised to cancel the in-progress imminent peril group state of the MCVideo group as determined by the procedures of subclause x.x.x.x, the MCVideo client:
 - a) should indicate to the MCVideo user that they are not authorised to cancel the in-progress imminent peril group state of the MCVideo group; and
 - b) shall skip the remaining steps of the current subclause;
- 2) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body populated as specified in subclause x.x.x.x;
- 3) shall include a Resource-Priority header field and comply with the procedures in subclause x.x.x.x;
- 4) shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with:
 - a) the <session-type> element set to a value of "chat"; and
 - b) the <mcvideo-request-uri> element set to the group identity;

NOTE 1: The MCVideo ID of the originating MCVideo user is not included in the body, as this will be inserted into the body of the SIP re-INVITE request that is sent by the originating participating MCVideo function.

- 5) shall include the g.3gpp.mcvideo media feature tag in the Contact header field of the SIP re-INVITE request according to IETF RFC 3840 [22];
- 6) if the SIP re-INVITE request is to be sent within an on-demand session, shall include in the SIP re-INVITE request an SDP offer according to 3GPP TS 24.229 [11] with the clarifications specified in subclause x.x.x.x;
- 7) shall send the SIP re-INVITE request according to 3GPP TS 24.229 [11].

On receiving a SIP 2xx response to the SIP re-INVITE request, the MCVideo client:

- 1) shall interact with the user plane as specified in 3GPP TS 24.581 [5];
- 2) shall set the MCVideo imminent peril group state of the group to "MIG 1: no-imminent-peril"; and
- 3) shall set the MCVideo imminent peril group call state of the group to "MIGC 1: imminent-peril-gc-capable".

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

- 1) if the SIP 4xx response, SIP 5xx response or SIP 6xx response:
 - a) contains an application/vnd.3gpp.mcvideo-info+xml MIME body with an <imminentperil-ind> element set to a value of "true"; or
 - b) does not contain an application/vnd.3gpp.mcvideo-info+xml MIME body with an <imminentperil-ind> element;

then the MCVideo client shall set the MCVideo imminent peril group state as "MIG 2: in-progress".

NOTE 2: This is the case where the MCVideo client requested the cancellation of the MCVideo imminent peril in-progress state and was rejected.

9.2.2.2.1.6 MCVideo client receives a SIP INVITE request for an MCVideo group call

This procedure is used for MCVideo emergency and MCVideo imminent peril calls when the MCVideo client is affiliated but not joined to the chat group.

In the procedures in this subclause:

- 1) emergency indication in an incoming SIP INVITE request refers to the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body; and

- 2) imminent peril indication in an incoming SIP INVITE request refers to the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body.

Upon receipt of an initial SIP INVITE request, the MCVideo client:

- 1) may reject the SIP INVITE request if either of the following conditions is met:
 - a) MCVideo client does not have enough resources to handle the call; or
 - b) any other reason outside the scope of this specification;and skip the rest of the steps;
- 2) if the SIP INVITE request is rejected in step 1), shall respond toward participating MCVideo function either with appropriate reject code as specified in 3GPP TS 24.229 [11] and warning texts as specified in subclause 4.4 or with SIP 480 (Temporarily unavailable) response not including warning texts if the user is authorised to restrict the reason for failure and skip the rest of the steps of this subclause;

NOTE 1: if the SIP INVITE request contains an emergency indication or imminent peril indication, the MCVideo client can by means beyond the scope of this specification choose to accept the request.

- 3) if the SIP INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <emergency-ind> element set to a value of "true":
 - a) should display to the MCVideo user an indication that this is a SIP INVITE request for an MCVideo emergency group call and:
 - i) should display the MCVideo ID of the originator of the MCVideo emergency group call contained in the <mcvideo-calling-user-id> element of the application/vnd.3gpp.mcvideo-info+xml MIME body;
 - ii) should display the MCVideo group identity of the group with the emergency condition contained in the <mcvideo-calling-group-id> element; and
 - iii) if the <alert-ind> element is set to "true", should display to the MCVideo user an indication of the MCVideo emergency alert and associated information;
 - b) shall set the MCVideo emergency group state to "MEG 2: in-progress";
 - c) shall set the MCVideo imminent peril group state to "MIG 1: no-imminent-peril"; and
 - d) shall set the MCVideo imminent peril group call state to "MIGC 1: imminent-peril-gc-capable"; otherwise
- 4) if the SIP INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <imminentperil-ind> element set to a value of "true":
 - a) should display to the MCVideo user an indication that this is a SIP INVITE request for an MCVideo imminent peril group call and:
 - i) should display the MCVideo ID of the originator of the MCVideo imminent peril group call contained in the <mcvideo-calling-user-id> element of the application/vnd.3gpp.mcvideo-info+xml MIME body; and
 - ii) should display the MCVideo group identity of the group with the imminent peril condition contained in the <mcvideo-calling-group-id> element; and
 - b) shall set the MCVideo imminent peril group state to "MIG 3: in-progress";
- 5) shall check if a Resource-Priority header field is included in the incoming SIP 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 [11];
- 6) shall accept the SIP INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [11];
- 7) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;

- 8) shall include the g.3gpp.mcvideo media feature tag in the Contact header field of the SIP 200 (OK) response;
- 9) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo" in the Contact header field of the SIP 200 (OK) response;
- 10) shall include the Session-Expires header field in the SIP 200 (OK) response and start the SIP session timer according to IETF RFC 4028 [23]. If no "refresher" parameter was included in the received SIP INVITE request the "refresher" parameter in the Session-Expires header field shall be set to "uas", otherwise shall include a "refresher" parameter set to the value received in the Session-Expires header field the received SIP INVITE request;
- 11) shall 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 [11] with the clarifications given in subclause x.x.x.x;
- 12) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideo-called-party-id> element set to the MCVideo ID of the called MCVideo user, in the SIP 200 (OK) response;
- 13) shall send the SIP 200 (OK) response towards the MCVideo server according to rules and procedures of 3GPP TS 24.229 [11]; and
- 14) shall interact with the media plane as specified in 3GPP TS 24.581 [5].

9.2.2.3 Participating MCVideo function procedures

Editor's Note: All subclauses x.x.x are not yet specified for MCVideo and need to be added in 24.281, 24.481, 24.484, and 24.581.

9.2.2.3.1 On-demand chat group call

9.2.2.3.1.1 MCVideo chat session establishment

In the procedures in this subclause:

- 1) group identity in an incoming SIP INVITE request refers to the group identity from the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the incoming SIP INVITE request;
- 2) emergency indication in an incoming SIP INVITE request refers to the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body;
- 3) imminent peril indication in an incoming SIP INVITE request refers to the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body.

Upon receipt of a "SIP INVITE request for originating participating MCVideo function" for a group identity identifying a chat MCVideo group containing an application/vnd.3gpp.mcvideo-info+xml MIME body with the <session-type> element set to a value of "chat", the participating MCVideo function:

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP INVITE request with a SIP 500 (Server Internal Error) response. The participating MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15]. Otherwise, continue with the rest of the steps;

NOTE 1: if the SIP INVITE request contains an emergency indication set to a value of "true" or an imminent peril indication set to a value of "true" and this is an authorised request for originating a priority call as determined by subclause x.x.x.x, the participating MCVideo function can according to local policy choose to accept the request.

- 2) shall determine the MCVideo ID of the calling user from public user identity in the P-Asserted-Identity header field of the SIP INVITE request, and authorise the calling user;

NOTE 2: The MCVideo ID of the calling user is bound to the public user identity at the time of service authorisation, as documented in subclause x.x.x.x.

- 3) if through local policy in the originating participating MCVideo function, the user identified by the MCVideo ID is not authorised to make chat group calls, shall reject the "SIP INVITE request for originating participating

MCVideo function" with a SIP 403 (Forbidden) response to the SIP INVITE request, with warning text set to "108 user not authorised to make chat group calls" in a Warning header field as specified in subclause 4.4;

- 4) shall determine if the media parameters are acceptable and the MCVideo codecs are offered in the SDP offer and if not, reject the request with a SIP 488 (Not Acceptable Here) response. Otherwise, continue with the rest of the steps;
- 5) shall check if the number of maximum simultaneous MCVideo group calls supported for the MCVideo user as specified in the <MaxSimultaneousCallsN6> element of the <MCVideo-group-call> element of the MCVideo user profile document (see the MCVideo user profile document in 3GPP TS 24.484 [25]) has been exceeded. If exceeded, the MCVideo function shall respond with a SIP 486 (Busy Here) response with the warning text set to "103 maximum simultaneous MCVideo group calls reached" in a Warning header field as specified in subclause 4.4. Otherwise, continue with the rest of the steps;

NOTE 3: If the SIP INVITE request contains an emergency indication set to a value of "true" or an imminent peril indication set to a value of "true" and this is an authorised request for originating a priority call as determined by subclause x.x.x.x, the participating MCVideo function can according to local policy choose to allow for an exception to the limit for the maximum simultaneous MCVideo sessions supported for the MCVideo user.

- 6) if the user identified by the MCVideo ID is not affiliated to the group identified in the "SIP INVITE request for originating participating MCVideo function" as determined by subclause x.x.x.x, shall perform the actions specified in subclause x.x.x.x for implicit affiliation;
- 7) if the actions for implicit affiliation specified in step 6) above were performed but not successful in affiliating the MCVideo user due to the MCVideo user already having N2 simultaneous affiliations, shall reject the "SIP INVITE request for originating participating MCVideo function" with a SIP 486 (Busy Here) response with the warning text set to "102 too many simultaneous affiliations" in a Warning header field as specified in subclause 4.4. and skip the rest of the steps.

NOTE 4: N2 is the total number of MCVideo groups that an MCVideo user can be affiliated to simultaneously as specified in 3GPP TS 23.281 [26].

NOTE 5: if the SIP INVITE request contains an emergency indication set to a value of "true" or an imminent peril indication set to a value of "true" and this is an authorised request for originating a priority call as determined by subclause x.x.x.x, the participating MCVideo function can according to local policy choose to allow an exception to the N2 limit. Alternatively, a lower priority affiliation of the MCVideo user could be cancelled to allow for the new affiliation.

- 8) shall determine the public service identity of the controlling MCVideo function associated with the group identity in the SIP INVITE request;

NOTE 6: The public service identity can identify the controlling MCVideo function in the primary MCVideo system or a partner MCVideo system.

NOTE 7: How the participating MCVideo server discovers the public service identity of the controlling MCVideo function associated with the group identity is out of scope of the current document.

- 9) shall generate a SIP INVITE request as specified in subclause x.x.x.x;
- 10) shall set the Request-URI to the public service identity of the controlling MCVideo function associated with the group identity present in the incoming SIP INVITE request;
- 11) shall include the MCVideo ID of the calling user in <mcvideo-calling-user-id> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP INVITE request;
- 12) shall include in the SIP INVITE request an SDP offer based on the SDP offer in the received SIP INVITE request as specified in subclause x.x.x.x;
- 13) if the received SIP INVITE request contains an application/vnd.3gpp.location-info+xml MIME body as specified in Annex F.3; and
 - a) if not already included, shall include a Content-Type header field set to "application/vnd.3gpp.location-info+xml"; and

- b) if not already copied, shall copy the contents of the application/vnd.3gpp.location-info+xml MIME body received in the SIP INVITE request into an application/vnd.3gpp.location-info+xml MIME body included in the outgoing SIP request;

NOTE 8: Note that the application/vnd.3gpp.mcvideo-info+xml MIME body will already have been copied into the outgoing SIP INVITE request by subclause x.x.x.x.

- 14) if a Resource-Priority header field was included in the received SIP INVITE request, shall include a Resource-Priority header field according to rules and procedures of IETF RFC 4412 [33] set to the value indicated in the Resource-Priority header field of the SIP INVITE request from the MCVideo client; and

NOTE 9: The participating MCVideo function will leave verification of the Resource-Priority header field to the controlling MCVideo function.

- 15) shall forward the SIP INVITE request according to 3GPP TS 24.229 [11].

Upon receipt of a SIP 302 (Moved Temporarily) response to the above SIP INVITE request in step 14), the participating MCVideo function:

- 1) shall generate a SIP INVITE request as specified in subclause x.x.x.x;
- 2) shall include an SDP offer based upon the SDP offer in the received SIP INVITE request from the MCVideo client as specified in subclause x.x.x.x; and
- 3) shall forward the SIP INVITE request according to 3GPP TS 24.229 [11];

Upon receipt of a SIP 2xx response to the above SIP INVITE request in step 14) the participating MCVideo function:

- 1) shall generate a SIP 200 (OK) response as specified in the subclause x.x.x.x;
- 2) shall include in the SIP 200 (OK) response an SDP answer as specified in the subclause x.x.x.x;
- 3) shall include Warning header field(s) that were received in the incoming SIP 200 (OK) response;
- 4) shall include the public service identity received in the P-Asserted-Identity header field of the incoming SIP 200 (OK) response into the P-Asserted-Identity header field of the outgoing SIP 200 (OK) response;
- 5) if the procedures of subclause x.x.x.x for implicit affiliation were performed in the present subclause, shall complete the implicit affiliation by performing the procedures of subclause x.x.x.x;
- 6) shall send the SIP 200 (OK) response to the MCVideo client according to 3GPP TS 24.229 [11]; and
- 7) shall interact with the media plane as specified in 3GPP TS 24.581 [5].

Upon receipt of a SIP 4xx, 5xx or 6xx response to the above SIP INVITE request in step 14) the participating MCVideo function:

- 1) shall generate a SIP response according to 3GPP TS 24.229 [11];
- 2) shall include Warning header field(s) that were received in the incoming SIP response;
- 3) shall forward the SIP response to the MCVideo client according to 3GPP TS 24.229 [11]; and
- 4) if the implicit affiliation procedures of subclause x.x.x.x were invoked in the current procedure, shall perform the procedures of subclause x.x.x.x.

9.2.2.3.1.2 Reception of a SIP re-INVITE request from served MCVideo client

This subclause covers both on-demand session.

Upon receipt of a SIP re-INVITE request for a served MCVideo client of a chat MCVideo group, the participating MCVideo function:

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the "SIP INVITE request for terminating participating MCVideo function" with a SIP 500 (Server Internal Error) response. The participating MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15]. Otherwise, continue with the rest of the steps;

NOTE 1: If the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <emergency-ind> element set to a value of "true", the participating MCVideo function may by means beyond the scope of this specification choose to accept the request.

- 2) shall determine if the media parameters are acceptable and the MCVideo codec are offered in the SDP offer and if not, reject the request with a SIP 488 (Not Acceptable Here) response. Otherwise, continue with the rest of the steps;
- 3) shall generate an outgoing SIP re-INVITE request as specified in subclause x.x.x.x;
- 4) shall, if the SIP re-INVITE request was received within an on-demand session, include in the SIP re-INVITE request an SDP offer based on the SDP offer in the received SIP re-INVITE request as specified in subclause x.x.x.x;
- 5) if the received SIP re-INVITE request contains a Resource-Priority header field, shall include a Resource-Priority header field with the contents set as in the received Resource-Priority header field; and

NOTE 3: The controlling MCVideo function will determine the validity of the Resource-Priority header field.

- 6) shall forward the SIP re-INVITE request according to 3GPP TS 24.229 [11].

Upon receipt of a SIP 2xx response to the above SIP re-INVITE request in step 6) the participating MCVideo function:

- 1) shall generate a SIP 200 (OK) response as specified in the subclause x.x.x.x;
- 2) if the SIP 200 (OK) response is to be sent within an on-demand session, shall include in the SIP 200 (OK) response an SDP answer as specified in the subclause x.x.x.x;
- 3) shall include Warning header field(s) that were received in the incoming SIP 200 (OK) response; and
- 4) shall send the SIP 200 (OK) response to the MCVideo client according to 3GPP TS 24.229 [11];

Upon receipt of a SIP 403 (Forbidden) response to the sent SIP re-INVITE request the participating MCVideo function:

- 1) shall generate a SIP 403 (Forbidden) response according to 3GPP TS 24.229 [11];
- 2) shall copy, if included in the received SIP 403 (Forbidden) response, the application/vnd.3gpp.mcvideo-info+xml MIME body MIME body to the outgoing SIP (Forbidden) response;
- 3) shall include Warning header field(s) that were received in the incoming SIP 403 (Forbidden) response; and
- 4) shall forward the SIP 403 (Forbidden) response to the MCVideo client according to 3GPP TS 24.229 [11];

9.2.2.3.1.3 Reception of a SIP INVITE request for terminating MCVideo client

This subclause covers both on-demand session.

Upon receipt of a "SIP INVITE request for terminating participating MCVideo function", for a terminating MCVideo client of a chat MCVideo group, the participating MCVideo function:

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the "SIP INVITE request for terminating participating MCVideo function" with a SIP 500 (Server Internal Error) response. The participating MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15]. Otherwise, continue with the rest of the steps;

NOTE: If the SIP INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <emergency-ind> element set to a value of "true", the participating MCVideo function can by means beyond the scope of this specification choose to accept the request.

- 2) shall check the presence of the isfocus media feature tag in the URI of the Contact header field and if it is not present then the participating MCVideo function shall reject the request with a SIP 403 (Forbidden) response with the warning text set to "104 isfocus not assigned" in a Warning header field as specified in subclause 4.4. Otherwise, continue with the rest of the steps;
- 3) shall generate a SIP INVITE request as specified in subclause x.x.x.x;

- 4) shall set the Request-URI to the public user identity associated with the MCVideo ID of the MCVideo user to be invited based on the contents of the Request-URI of the received "SIP INVITE request for terminating participating MCVideo function";
- 5) shall copy the contents of the P-Asserted-Identity header field of the incoming "SIP INVITE request for terminating participating MCVideo function" to the P-Asserted-Identity header field of the outgoing SIP INVITE request;
- 6) shall include in the SIP INVITE request an SDP offer based on the SDP offer in the received "SIP INVITE request for terminating participating MCVideo function" as specified in subclause x.x.x.x;
- 7) if the received SIP INVITE request contains a Resource-Priority header field, shall include a Resource-Priority header field with the contents set as in the received Resource-Priority header field;
- 8) shall perform the procedures specified in subclause x.x.x.x to include any MIME bodies in the received SIP INVITE request; and
- 9) shall send the SIP INVITE request towards the MCVideo client according to 3GPP TS 24.229 [11].

Upon receiving a SIP 200 (OK) response to the above SIP INVITE request sent to the MCVideo client, the participating MCVideo function:

- 1) shall generate a SIP 200 (OK) response as described in the subclause x.x.x.x;
- 2) shall include in the SIP 200 (OK) response an SDP answer based on the SDP answer in the received SIP 200 (OK) response as specified in subclause x.x.x.x;
- 3) shall interact with the media plane as specified in 3GPP TS 24.581 [5]; and
- 4) shall forward the SIP 200 (OK) response according to 3GPP TS 24.229 [11].

9.2.2.3.1.4 Reception of a SIP re-INVITE request for terminating MCVideo client

This subclause covers both on-demand session.

Upon receipt of a SIP re-INVITE request for a terminating MCVideo client of a chat MCVideo group, the participating MCVideo function:

- 1) 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 [11];
- 2) shall generate an outgoing SIP re-INVITE request as specified in subclause x.x.x.x;
- 3) shall include in the SIP re-INVITE request an SDP offer based on the SDP offer in the received SIP re-INVITE request as specified in subclause x.x.x.x; and
- 4) shall send the SIP re-INVITE request towards the MCVideo client according to 3GPP TS 24.229 [11].

Upon receiving a SIP 200 (OK) response to the above SIP re-INVITE request sent to the MCVideo client, the participating MCVideo function:

- 1) shall generate a SIP 200 (OK) response as described in the subclause x.x.x.x;
- 2) shall include in the SIP 200 (OK) response an SDP answer based on the SDP answer in the received SIP 200 (OK) response as specified in subclause x.x.x.x; and
- 3) shall forward the SIP 200 (OK) response according to 3GPP TS 24.229 [11].

9.2.2.4 Controlling MCVideo function procedures

Editor's Note: All subclauses x.x.x are not yet specified for MCVideo and need to be added in 24.281, 24.481, 24.484, and 24.581.

9.2.2.4.1 On-demand chat group call

9.2.2.4.1.1 MCVideo chat session establishment

In the procedures in this subclause:

- 1) MCVideo ID in an incoming SIP INVITE request refers to the MCVideo ID of the originating user from the <mcvideo-calling-user-id> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the incoming SIP INVITE request;
- 2) group identity in an incoming SIP INVITE request refers to the group identity from the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the incoming SIP INVITE request;
- 3) MCVideo ID in an outgoing SIP INVITE request refers to the MCVideo ID of the called user in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the outgoing SIP INVITE request;
- 4) emergency indication in an incoming SIP INVITE request refers to the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body; and
- 5) alert indication in an incoming SIP INVITE request refers to the <alert-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body.

Upon receipt of a "SIP INVITE request for controlling MCVideo function of an MCVideo group" containing a group identity identifying a chat MCVideo group, the controlling MCVideo function:

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP INVITE request with a SIP 500 (Server Internal Error) response. The controlling MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15] and skip the rest of the steps;

NOTE 1: If the SIP INVITE request contains an emergency indication set to a value of "true", the controlling MCVideo function can by means beyond the scope of this specification choose to accept the request.

- 2) shall reject the SIP request with a SIP 403 (Forbidden) response and not process the remaining steps if:
 - a) an Accept-Contact header field does not include the g.3gpp.mcvideo media feature tag;
 - b) an Accept-Contact header field does not include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo"; or
 - c) the isfocus media feature tag is present in the Contact header field;
- 3) if received SIP INVITE request includes an application/vnd.3gpp.mcvideo-info+xml MIME body with an <emergency-ind> element included or an <imminent-peril> element included, shall validate the request as described in subclause x.x.x.x;
- 4) shall retrieve the necessary group document(s) from the group management server for the group identity contained in the SIP INVITE request and carry out initial processing as specified in subclause x.x.x.x and continue with the rest of the steps if the checks in subclause x.x.x.x succeed;
- 5) if the MCVideo user identified by the MCVideo ID in the SIP INVITE request is not affiliated with the MCVideo group identified by the group identity in the SIP INVITE request as determined by the procedures of subclause x.x.x.x:
 - a) shall check if the MCVideo user is eligible to be implicitly affiliated with the MCVideo chat group as determined by subclause x.x.x.x; and
 - b) if the MCVideo user is not eligible for implicit affiliation, shall reject the SIP INVITE request with a SIP 403 (Forbidden) response with the warning text set to "120 user is not affiliated to this group" in a Warning header field as specified in subclause x.x.x.x and skip the rest of the steps below;
- 6) if the SIP INVITE request contains unauthorised request for an MCVideo emergency group call as determined by subclause x.x.x.x:

- a) shall reject the SIP INVITE request with a SIP 403 (Forbidden) response as specified in subclause x.x.x.x; and
 - b) shall send the SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11] and skip the rest of the steps;
- 7) if the SIP INVITE request contains an unauthorised request for an MCVideo imminent peril group call as determined by subclause x.x.x.x, shall reject the SIP INVITE request with a SIP 403 (Forbidden) response with the following clarifications:
- a) shall include in the SIP 403 (Forbidden) response an application/vnd.3gpp.mcvideo-info+xml MIME body as specified in clause F.1 with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <imminentperil-ind> element set to a value of "false"; and
 - b) shall send the SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11] and skip the rest of the steps;
- 8) if a Resource-Priority header field is included in the SIP INVITE request:
- a) if the Resource-Priority header field is set to the value indicated for emergency calls and the SIP INVITE request does not contain an authorised request for an MCVideo emergency call as determined in step 4 above and the in-progress emergency state of the group is set to a value of "false", shall reject the SIP INVITE request with a SIP 403 (Forbidden) response and skip the remaining steps; and
 - b) if the Resource-Priority header field is set to the value indicated for imminent peril calls and the SIP INVITE request does not contain an authorised request for an MCVideo imminent peril call as determined in step 5) above and the in-progress imminent peril state of the group is set to a value of "false", shall reject the SIP INVITE request with a SIP 403 (Forbidden) response; and skip the remaining steps;
- 9) shall determine if the media parameters are acceptable and the MCVideo codecs are offered in the SDP offer and if not reject the request with a SIP 488 (Not Acceptable Here) response and skip the rest of the steps;
- 10) shall create a chat group session and allocate an MCVideo session identity for the chat group session if the MCVideo chat group session identity does not already exist, and may handle timer TNG3 (group call timer) as specified in subclause x.x.x.x;
- 11) if the chat group session is ongoing and the <on-network-max-participant-count> as specified in 3GPP TS 24.481 [24] is already reached:
- a) if, according to local policy, the user identified by the MCVideo ID in the SIP INVITE request is deemed to have a higher priority than an existing user in the chat group session, may remove a participant from the session by following subclause 9.2.1.4.4.3, and skip the next step; and
- NOTE 2: The local policy for deciding whether to admit a user to a call that has reached its maximum amount of participants can include the <user-priority> and the <participant-type> of the user as well as other information of the user from the group document as specified in 3GPP TS 24.481 [24]. The local policy decisions can also include taking into account whether the imminent-peril indicator or emergency indicator was received in the SIP INVITE request.
- b) shall return a SIP 486 (Busy Here) response with the warning text set to "122 too many participants" to the originating network as specified in subclause 4.4. Otherwise, continue with the rest of the steps;
- 12) if the received SIP INVITE request was determined to be eligible for implicit affiliation in step 5) and if subclause x.x.x.x was not previously invoked in the present subclause, shall perform the implicit affiliation as specified in subclause x.x.x.x;
- 13) if the SIP INVITE request contains an emergency indication set to a value of "true" or the in-progress emergency state of the group to "true" the controlling MCVideo function shall:
- a) validate that the SIP INVITE request includes a Resource-Priority header field populated with the values for an MCVideo emergency group call as specified in subclause x.x.x.x, and if not:
 - i) perform the actions specified in subclause x.x.x.x;
 - ii) send the SIP UPDATE request generated in subclause x.x.x.x towards the initiator of the SIP INVITE request according to 3GPP TS 24.229 [11]; and

- iii) upon receiving a SIP 200 (OK) response to the SIP UPDATE request sent in subclause x.x.x.x, proceed with the rest of the steps.

NOTE 3: Verify that the Resource-Priority header is included and properly populated for both ongoing and newly-entered in-progress emergency states of the specified group.

- b) if the in-progress emergency state of the group is set to a value of "true" and this MCVideo user is indicating a new emergency indication:
 - i) for each of the other affiliated members of the group generate a SIP MESSAGE request notification of the MCVideo user's emergency indication as specified in subclause x.x.x.x with the following clarifications:
 - A) set the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "true";
 - B) if the received SIP INVITE contains an alert indication set to a value of "true" and this is an authorised request for an MCVideo emergency alert meeting the conditions specified in subclause x.x.x.x, perform the procedures specified in subclause x.x.x.x; and
 - C) send the SIP MESSAGE request as specified in 3GPP TS 24.229 [11];
 - ii) cache the information that this MCVideo user has initiated an MCVideo emergency call; and
 - iii) if the SIP INVITE request contains an authorised request for an MCVideo emergency alert as determined in step i) B) above, cache the information that this MCVideo user has initiated an MCVideo emergency alert; and
- c) if the in-progress emergency state of the group is set to a value of "false":
 - i) shall set the value of the in-progress emergency state of the group to "true";
 - ii) shall start timer TNG2 (in-progress emergency group call timer) and handle its expiry as specified in subclause x.x.x.x;
 - iii) shall generate SIP re-INVITE requests for the MCVideo emergency group call to the other affiliated and joined participants of the chat MCVideo group as specified in subclause x.x.x.x;
 - iv) shall generate SIP INVITE requests for the MCVideo emergency group call to the affiliated but not joined members of the chat MCVideo group as specified in subclause x.x.x.x;
 - A) for each affiliated but not joined member shall send the SIP INVITE request towards the MCVideo client as specified in 3GPP TS 24.229 [11]; and
 - B) upon receiving a SIP 200 (OK) response to the SIP INVITE request the controlling MCVideo function shall interact with the media plane as specified in 3GPP TS 24.581 [5];
 - v) shall cache the information that this MCVideo user has initiated an MCVideo emergency call; and
 - vi) if the <alert-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body is set to "true" and is an authorised request for an MCVideo emergency alert as specified in subclause x.x.x.x, shall cache the information that this MCVideo user has initiated an MCVideo emergency alert; and
 - vii) if the in-progress imminent peril state of the group is set to a value of "true", shall set it to a value of "false";
- 14) if the in-progress emergency state of the group is set to a value of "false" and if the SIP INVITE request contains an imminent peril indication set to a value of "true" or the in-progress imminent peril state of the group to "true", the controlling MCVideo function shall:
 - a) validate that the SIP INVITE request includes a Resource-Priority header field populated with the values for an MCVideo imminent peril group call as specified in subclause x.x.x.x, and if not:
 - i) perform the actions specified in subclause x.x.x.x;
 - ii) send the SIP UPDATE request generated in subclause x.x.x.x towards the initiator of the SIP INVITE request according to 3GPP TS 24.229 [11]; and

- iii) upon receiving a SIP 200 (OK) response to the SIP UPDATE request sent in subclause x.x.x.x proceed with the rest of the steps.

NOTE 4: Verify that the Resource-Priority header is included and properly populated for both ongoing and newly-entered in-progress imminent peril states of the specified group.

- b) if the in-progress imminent peril state of the group is set to a value of "true" and this MCVideo user is indicating a new imminent peril indication:
 - i) for each of the other affiliated member of the group generate a SIP MESSAGE request notification of the MCVideo user's imminent peril indication as specified in subclause x.x.x.x with the following clarifications:
 - A) set the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "true"; and
 - B) send the SIP MESSAGE request as specified in 3GPP TS 24.229 [11]; and
 - ii) cache the information that this MCVideo user has initiated an MCVideo imminent peril call; and
 - c) if the in-progress imminent peril state of the group is set to a value of "false":
 - i) shall set the value of the in-progress imminent peril state of the group to "true";
 - ii) shall generate SIP re-INVITE requests for the MCVideo imminent peril group call to the other affiliated and joined participants of the chat MCVideo group as specified in subclause x.x.x.x;
 - iii) shall generate SIP INVITE requests for the MCVideo imminent peril call to the affiliated but not joined members of the chat MCVideo group as specified in subclause x.x.x.x;
 - A) for each affiliated but not joined member shall send the SIP INVITE request towards the MCVideo client as specified in 3GPP TS 24.229 [11]; and
 - B) Upon receiving a SIP 200 (OK) response to the SIP INVITE request the controlling MCVideo function shall interact with the media plane as specified in 3GPP TS 24.581 [5]; and
 - iv) shall cache the information that this MCVideo user has initiated an MCVideo imminent peril call;
- 15) shall accept the SIP request and generate a SIP 200 (OK) response to the SIP INVITE request according to 3GPP TS 24.229 [11];
- 16) shall include in the SIP 200 (OK) response an SDP answer according to 3GPP TS 24.229 [11] with the clarifications specified in subclause x.x.x.x unless the procedures of subclause x.x.x.x were performed in step 9) or step 10 above;
- 17) should include the Session-Expires header field and start supervising the SIP session according to IETF RFC 4028 [23]. It is recommended that the "refresher" header field parameter is omitted. If included, the "refresher" header field parameter shall be set to "uac";
- 18) shall include the "timer" option tag in a Require header field;
- 19) shall include the following in a Contact header field:
- a) the g.3gpp.mcvideo media feature tag;
 - b) the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo";
 - c) the MCVideo session identity; and
 - d) the media feature tag isfocus;
- 20) shall include the "tdialog" option tag in a Supported header field according to IETF RFC 4538 [32];
- 21) if the SIP INVITE request contains an alert indication set to a value of "true" and this is an unauthorised request for an MCVideo emergency alert as specified in subclause x.x.x.x, shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;

22) if the received SIP INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <imminentperil-ind> element set to a value of "true" and if the in-progress emergency state of the group is set to a value of "true", shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;

NOTE 5: In this case, the request was for an imminent peril call but a higher priority MCVideo emergency call was already in progress on the group. Hence, the imminent peril call request aspect of the request is denied but the request is granted with emergency level priority.

23) shall interact with media plane as specified in 3GPP TS 24.581 [5];

24) shall send the SIP 200 (OK) response to the MCVideo client according to 3GPP TS 24.229 [11]; and

25) if the chat group session was already ongoing and if at least one of the participants has subscribed to the conference event package, shall send a SIP NOTIFY request to all participants with a subscription to the conference event package as specified in subclause 9.2.3.4.2.

Upon receiving a SIP ACK to the SIP 200 (OK) response sent towards the inviting MCVideo client, and the SIP 200 (OK) response was sent with the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4, the controlling MCVideo function shall follow the procedures in subclause x.x.x.x.

9.2.2.4.1.2 Receipt of a SIP re-INVITE request

In the procedures in this subclause:

- 1) emergency indication in an incoming SIP re-INVITE request refers to the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body; and
- 2) imminent peril indication in an incoming SIP re-INVITE request refers to the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body.

Upon receipt of a SIP re-INVITE request for an MCVideo session identity identifying a chat MCVideo group session, the controlling MCVideo function:

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP re-INVITE request with a SIP 500 (Server Internal Error) response. The controlling MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15] and skip the rest of the steps;

NOTE 1: if the SIP re-INVITE request contains an emergency indication or an imminent peril indication set to a value of "true" and this is an authorised request for originating an MCVideo emergency group call as determined by subclause x.x.x.x, or for originating an MCVideo imminent peril group call as determined by subclause x.x.x.x, the controlling MCVideo function can according to local policy choose to accept the request.

- 2) if received SIP re-INVITE request includes an application/vnd.3gpp.mcvideo-info+xml MIME body with an <emergency-ind> element included or an <imminent-peril> element included, shall validate the request as described in subclause x.x.x.x;
- 3) if the SIP re-INVITE request contains an unauthorised request for an MCVideo emergency call as determined by subclause x.x.x.x:
 - a) shall reject the SIP INVITE request with a SIP 403 (Forbidden) response as specified in subclause x.x.x.x; and
 - b) shall send the SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11] and skip the rest of the steps;
- 4) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <emergency-ind> element set to a value of "true" and is an authorised request to initiate an MCVideo emergency group call as determined by subclause x.x.x.x, the controlling MCVideo function shall:
 - a) validate that the SIP re-INVITE request includes a Resource-Priority header field is populated correctly for an MCVideo emergency group call as specified in subclause x.x.x.x, and if not:

- i) shall perform the actions specified in subclause x.x.x.x; and
- ii) upon receiving a SIP 200 (OK) response to the SIP UPDATE request sent in subclause x.x.x.x shall proceed with the rest of the steps.

NOTE 2: Verify that the Resource-Priority header is included and properly populated for both ongoing and newly-entered in-progress emergency states of the specified group.

- b) if the in-progress emergency state of the group is set to a value of "true" and this MCVideo user is indicating a new emergency indication:
 - i) shall cache the MCVideo ID of the MCVideo user that has initiated an MCVideo emergency call;
 - ii) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <alert-ind> element set to a value of "true" and is an authorised request for an MCVideo emergency alert as determined by subclause x.x.x.x, shall cache the MCVideo ID of the MCVideo user that has initiated an MCVideo emergency alert; and
 - iii) for each of the other affiliated members of the group, generate a SIP MESSAGE request notification of the MCVideo user's emergency indication as specified in subclause x.x.x.x with the following clarifications:
 - A) set the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "true";
 - B) if the received SIP INVITE contains an alert indication set to a value of "true" and this is an authorised request for an MCVideo emergency alert meeting the conditions specified in subclause x.x.x.x, perform the procedures specified in subclause x.x.x.x; and
 - C) send the SIP MESSAGE request as specified in 3GPP TS 24.229 [11]; and
- c) if the in-progress emergency state of the group is set to a value of "false":
 - i) shall set the value of the in-progress emergency state of the group to "true";
 - ii) shall cache the MCVideo ID of the MCVideo user that has initiated an MCVideo emergency call;
 - iii) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <alert-ind> element set to a value of "true" and this is an authorised request for an MCVideo emergency alert as specified in subclause x.x.x.x, shall cache the MCVideo ID of the MCVideo user that has initiated an MCVideo emergency alert;
 - iv) shall start timer TNG2 (in-progress emergency group call timer) and handle its expiry as specified in subclause x.x.x.x;
 - v) shall generate SIP re-INVITE requests for the MCVideo emergency group call to the other affiliated and joined participants of the chat MCVideo group as specified in subclause x.x.x.x. The MCVideo controlling function:
 - A) for each affiliated and joined member shall send the SIP re-INVITE request towards the MCVideo client as specified in 3GPP TS 24.229 [11]; and
 - B) Upon receiving a SIP 200 (OK) response to the SIP re-INVITE request the controlling MCVideo function shall interact with the media plane as specified in 3GPP TS 24.581 [5]; and
 - vi) shall generate SIP INVITE requests for the MCVideo emergency group call to the affiliated but not joined members of the chat MCVideo group as specified in subclause x.x.x.x. The controlling MCVideo function:
 - A) for each affiliated but not joined member shall send the SIP INVITE request towards the MCVideo client as specified in 3GPP TS 24.229 [11]; and
 - B) Upon receiving a SIP 200 (OK) response to the SIP INVITE request the controlling MCVideo function shall interact with the media plane as specified in 3GPP TS 24.581 [5]; and

- vii) if the in-progress imminent peril state of the group is set to a value of "true", shall set it to a value of "false";
- 5) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <emergency-ind> element set to a value of "false" and is an unauthorised request for an MCVideo emergency group call cancellation as determined by subclause x.x.x.x:
- a) shall reject the SIP re-INVITE request with a SIP 403 (Forbidden) response;
 - b) shall include in the SIP 403 (Forbidden) response an application/vnd.3gpp.mcvideo-info+xml MIME body as specified in annex F.1 with an <emergency-ind> element set to a value of "true";
 - c) if an <alert-ind> element of the mcvideoinfo MIME body is included set to "false" and there is an outstanding MCVideo emergency alert for this MCVideo user, shall include in the application/vnd.3gpp.mcvideo-info+xml MIME body and <alert-ind> element set to a value of "true"; and
 - d) shall send the SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11] and skip the rest of the steps;
- 6) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <emergency-ind> element set to a value of "false" and is determined to be an authorised request for an MCVideo emergency call cancellation as specified in subclause x.x.x.x and the in-progress emergency state of the group to is set to a value of "true" the controlling MCVideo function shall:
- a) validate that the SIP INVITE request includes a Resource-Priority header field is populated correctly for a normal priority MCVideo group call as specified in subclause x.x.x.x, and if not:
 - i) shall perform the actions specified in subclause x.x.x.x; and
 - ii) upon receiving a SIP 200 (OK) response to the SIP UPDATE request sent in subclause x.x.x.x shall proceed with the rest of the steps;

NOTE 3: Verify that the Resource-Priority header is included and properly populated for an in-progress emergency state cancellation of the specified group.

- b) shall set the in-progress emergency group state of the group to a value of "false";
- c) shall clear the cache of the MCVideo ID of the MCVideo user identified by the <originated-by> element as having an outstanding MCVideo emergency group call;
- d) if an <alert-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body is included and set to "false" and is determined to be an authorised request for an MCVideo emergency alert cancellation as specified in subclause x.x.x.x and there is an outstanding MCVideo emergency alert for this MCVideo user shall:
 - i) if the received SIP re-INVITE request contains an <originated-by> element in the application/vnd.3gpp.mcvideo-info+xml MIME body, clear the cache of the MCVideo ID of the MCVideo user identified by the <originated-by> element as having an outstanding MCVideo emergency alert; and
 - ii) if the received SIP re-INVITE request does not contain an <originated-by> element in the application/vnd.3gpp.mcvideo-info+xml MIME body, clear the cache of the MCVideo ID of the sender of the SIP re-INVITE request as having an outstanding MCVideo emergency alert;
- e) shall generate SIP re-INVITE requests to the other affiliated and joined members of the MCVideo group as specified in subclause x.x.x.x. The MCVideo controlling function:
 - i) for each affiliated and joined member shall send the SIP re-INVITE request towards the MCVideo client as specified in 3GPP TS 24.229 [11]; and
 - ii) Upon receiving a SIP 200 (OK) response to the SIP re-INVITE request the controlling MCVideo function shall interact with the media plane as specified in 3GPP TS 24.581 [5]; and

NOTE 4: Subclause x.x.x.x will inform the affiliated and joined members of the cancellation of the MCVideo group's in-progress emergency state and the cancellation of the MCVideo emergency alert if applicable.

- f) for each of the affiliated but not joined members of the group shall:
 - i) generate a SIP MESSAGE request notification of the cancellation of the MCVideo user's emergency call as specified in subclause x.x.x.x;
 - ii) set the <emergency-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "false";
 - iii) if indicated above in step d), set the <alert-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "false"; and
 - iv) send the SIP MESSAGE request according to 3GPP TS 24.229 [11];
 - 7) if a Resource-Priority header field is included in the SIP INVITE request:
 - a) if the Resource-Priority header field is set to the value indicated for emergency calls and the received SIP re-INVITE request does not contain an authorised request for an MCVideo emergency call as determined in step 4) above and the in-progress emergency state of the group is set to a value of "false", shall reject the SIP INVITE request with a SIP 403 (Forbidden) response and skip the remaining steps; or
 - b) if the Resource-Priority header field is set to the value indicated for imminent peril calls and the received SIP re-INVITE request does not contain an authorised request for an MCVideo imminent peril call as determined by the procedures of subclause x.x.x.x and the in-progress imminent peril state of the group is set to a value of "false", shall reject the SIP INVITE request with a SIP 403 (Forbidden) response and skip the remaining steps;
 - 8) if the received SIP re-INVITE request contains an imminent peril indication, shall perform the procedures specified in subclause 9.2.2.4.1.3 and skip the rest of the steps;
 - 9) shall include in the SIP 200 (OK) response an SDP answer according to 3GPP TS 24.229 [11] with the clarifications specified in subclause x.x.x.x unless the procedures of subclause x.x.x.x were performed in step 5) a) i) above;
 - 10) shall include the "tdialog" option tag in a Supported header field according to IETF RFC 4538 [32];
 - 11) if the received SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <alert-ind> element set to a value of "true" and if this is an unauthorised request for an MCVideo emergency alert as determined by subclause x.x.x.x, shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;
 - 12) if the received SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <alert-ind> element set to a value of "false" and if this is an unauthorised request for an MCVideo emergency alert cancellation as determined by subclause x.x.x.x, shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;
 - 13) if the received SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <imminentperil-ind> element set to a value of "true", this is an authorised request for an MCVideo imminent peril group call and if the in-progress emergency state of the group is set to a value of "true", shall include in the SIP 200 (OK) response the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4;
- NOTE 5: In this case, the request was for an imminent peril call but a higher priority MCVideo emergency call was already in progress on the group. Hence, the imminent peril call request aspect of the request is denied but the request is granted with emergency level priority.
- 14) shall interact with media plane as specified in 3GPP TS 24.581 [5]; and
 - 15) shall send the SIP 200 (OK) response towards the MCVideo client according to 3GPP TS 24.229 [11].

Upon receiving a SIP ACK to the SIP 200 (OK) response sent towards the inviting MCVideo client, and the SIP 200 (OK) response was sent with the warning text set to "149 SIP INFO request pending" in a Warning header field as specified in subclause 4.4, the controlling MCVideo function shall follow the procedures in subclause x.x.x.x.

9.2.2.4.1.3 Handling of a SIP re-INVITE request for imminent peril session

In the procedures in this subclause:

- 1) imminent peril indication in an incoming SIP INVITE request refers to the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body.

When the controlling function receives a SIP re-INVITE request with an imminent peril indication, the controlling function:

- 1) if the SIP re-INVITE request contains an unauthorised request for an MCVideo imminent peril group call as determined by subclause x.x.x.x, shall reject the SIP re-INVITE request with a SIP 403 (Forbidden) response with the following clarifications:
 - a) shall include in the SIP 403 (Forbidden) response an application/vnd.3gpp.mcvideo-info+xml MIME body as specified in Annex F.1 with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <imminentperil-ind> element set to a value of "false"; and
 - b) shall send the SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11] and skip the rest of the steps;
- 2) if the in-progress emergency group state of the group is set to a value of "false" and if the SIP re-INVITE request contains an imminent peril indication set to a value of "true" or the in-progress imminent peril state of the group to "true", the controlling MCVideo function shall:
 - a) validate that the SIP re-INVITE request includes a Resource-Priority header field with the namespace set to the MCVideo-specific namespace and the priority set to the priority designated for imminent peril calls and if not:

Editor's Note: MCVideo-specific namespace needs to be specified.

- i) perform the actions specified in subclause x.x.x.x;
- ii) send the SIP UPDATE request generated in subclause x.x.x.x towards the initiator of the SIP re-INVITE request according to 3GPP TS 24.229 [11]; and
- iii) upon receiving a SIP 200 (OK) response to the SIP UPDATE request sent in subclause x.x.x.x proceed with the rest of the steps.

NOTE 3: Verify that the Resource-Priority header is included and properly populated for both ongoing and newly-entered in-progress imminent peril states of the specified group.

- b) if the in-progress imminent peril state of the group is set to a value of "true" and this MCVideo user is indicating a new imminent peril indication:
 - i) for each of the other affiliated member of the group generate a SIP MESSAGE request notification of the MCVideo user's imminent peril indication as specified in subclause x.x.x.x with the following clarifications:
 - A) set the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "true"; and
 - B) send the SIP MESSAGE request as specified in 3GPP TS 24.229 [11]; and
 - ii) cache the information that this MCVideo user has initiated an MCVideo imminent peril call; and
- c) if the in-progress imminent peril state of the group is set to a value of "false":
 - i) shall set the value of the in-progress imminent peril state of the group to "true";
 - ii) shall generate SIP re-INVITE requests for the MCVideo imminent peril group call to the other affiliated and joined participants of the chat MCVideo group as specified in subclause x.x.x.x;
 - iii) shall generate SIP INVITE requests for the MCVideo imminent peril group call to the affiliated but not joined members of the chat MCVideo group as specified in subclause x.x.x.x;

- A) for each affiliated but not joined member shall send the SIP INVITE request towards the MCVideo client as specified in 3GPP TS 24.229 [11]; and
 - B) Upon receiving a SIP 200 (OK) response to the SIP INVITE request the controlling MCVideo function shall interact with the media plane as specified in 3GPP TS 24.581 [5]; and
 - iv) shall cache the information that this MCVideo user has initiated an MCVideo imminent peril call;
- 3) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <imminentperil-ind> element set to a value of "false" and is an unauthorised request for an MCVideo imminent peril group call cancellation as determined by subclause x.x.x.x shall:
- a) reject the SIP re-INVITE request with a SIP 403 (Forbidden) response to the SIP re-INVITE request; and
 - b) include in the SIP 403 (Forbidden) response:
 - i) include in the SIP 403 (Forbidden) response an application/vnd.3gpp.mcvideo-info+xml MIME body as specified in Annex F.1 with the <mcvideoinfo> element containing the <mcvideo-Params> element with the <imminentperil-ind> element set to a value of "false";
 - ii) send the SIP 403 (Forbidden) response as specified in 3GPP TS 24.229 [11]; and
 - iii) skip the rest of the steps;
 - 4) if the SIP re-INVITE request contains an application/vnd.3gpp.mcvideo-info+xml MIME body with the <imminentperil-ind> element set to a value of "false" and is determined to be an authorised request for an MCVideo imminent peril call cancellation as specified in subclause x.x.x.x and the in-progress imminent peril state of the group to is set to a value of "true" the controlling MCVideo function shall:
 - a) validate that the SIP re-INVITE request includes a Resource-Priority header field with the namespace set to the MCVideo-specific namespace, and the priority set to the priority level designated for a normal priority MCVideo group call, and if not:
 - i) shall perform the actions specified in subclause x.x.x.x; and
 - ii) upon receiving a SIP 200 (OK) response to the SIP UPDATE request sent in subclause x.x.x.x shall proceed with the rest of the steps;

NOTE 3: verify that the Resource-Priority header is included and properly populated for an in-progress emergency group state cancellation of the specified group.

- b) shall set the in-progress imminent peril state of the group to a value of "false";
- c) shall cache the information that this MCVideo user no longer has an outstanding MCVideo imminent peril group call;
- d) shall generate SIP re-INVITES requests to the other affiliated and joined members of the MCVideo group as specified in subclause x.x.x.x. The MCVideo controlling function:
 - i) for each affiliated and joined member shall send the SIP re-INVITE request towards the MCVideo client as specified in 3GPP TS 24.229 [11]; and
 - ii) Upon receiving a SIP 200 (OK) response to the SIP re-INVITE request the controlling MCVideo function shall interact with the media plane as specified in 3GPP TS 24.581 [5]; and

NOTE 4: subclause x.x.x.x will inform the affiliated and joined members of the cancellation of the MCVideo group's in-progress emergency group state and the cancellation of the MCVideo emergency alert if applicable.

- e) for each of the affiliated but not joined members of the group shall:
 - i) generate a SIP MESSAGE request notification of the cancellation of the MCVideo user's imminent peril call as specified in subclause x.x.x.x;
 - ii) set the <imminentperil-ind> element of the application/vnd.3gpp.mcvideo-info+xml MIME body to a value of "false"; and

- iii) send the SIP MESSAGE request according to 3GPP TS 24.229 [11];
- 5) shall include in the SIP 200 (OK) response an SDP answer according to 3GPP TS 24.229 [11] with the clarifications specified in subclause x.x.x.x unless the procedures of subclause x.x.x.x were performed in step 2) or 4) above;
- 6) shall include the "norefersub" option tag in a Supported header field according to IETF RFC 4488 [31];
- 7) shall include the "tdialog" option tag in a Supported header field according to IETF RFC 4538 [32];
- 8) shall interact with media plane as specified in 3GPP TS 24.581 [5]; and
- 9) shall send the SIP 200 (OK) response towards the MCVideo client according to 3GPP TS 24.229 [11].

9.2.2.5 Non-controlling function of an MCVideo group procedures

Editor's Note: All subclauses x.x.x are not yet specified for MCVideo and need to be added in 24.281, 24.481, 24.484, and 24.581.

9.2.2.5.1 Terminating procedures

9.2.2.5.1.1 General

When receiving the "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" the MCVideo server can be acting as a controller MCVideo function in an ongoing chat group call or, if a chat group call is not ongoing, be initiated as a non-controlling MCVideo function and invite MCVideo users.

If a chat group call is not ongoing the MCVideo server shall perform the actions specified in subclause 9.2.2.5.1.2.

If the "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" is received when a chat group call is ongoing, the controlling MCVideo function may switch from operating in a controlling MCVideo function mode to operate in a non-controlling MCVideo function mode as specified in subclause 9.2.2.5.1.3.

When operating in the non-controlling mode and a SIP BYE request is received from the controlling MCVideo function, the non-controlling MCVideo function shall change from operating in the non-controlling mode to operating in the controlling mode as specified in subclause 9.2.2.5.1.4.

9.2.2.5.1.2 Initiating a chat group session

Upon receipt of a "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" and if a chat group call is not ongoing, the non-controlling MCVideo function of an MCVideo group:

NOTE 1: The Contact header field of the SIP INVITE request contains the "isfocus" feature media tag.

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP INVITE request with a SIP 500 (Server Internal Error) response. The controlling MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15]. Otherwise, continue with the rest of the steps;
- 2) shall determine if the media parameters are acceptable and the MCVideo codecs are offered in the SDP offer and if not, reject the request with a SIP 488 (Not Acceptable Here) response. Otherwise, continue with the rest of the steps;
- 3) shall reject the SIP request with a SIP 403 (Forbidden) response and not process the remaining steps if:
 - a) an Accept-Contact header field does not include the g.3gpp.mcvideo media feature tag; or
 - b) an Accept-Contact header field does not include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo";
- 4) if the partner MCVideo system does not have a mutual aid relationship with the primary MCVideo system identified by the contents of the P-Asserted-Identity, shall reject the "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" with a SIP 403 (Forbidden) response, with warning text set to "128

isfocus already assigned" in a Warning header field as specified in subclause 4.4, and shall not process the remaining steps;

- 5) shall check if a Resource-Priority header field is included in the incoming SIP INVITE request and may apply any preferential treatment to the SIP request as specified in 3GPP TS 24.229 [11];
- 6) shall generate SIP 200 (OK) response to the SIP INVITE request as specified in the subclause x.x.x.x before continuing with the rest of the steps;
- 7) shall include in the SIP 200 (OK) response an SDP answer to the SDP offer in the incoming SIP INVITE request as specified in the subclause x.x.x.x;
- 8) shall interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x.x; and

NOTE 2: Resulting media plane processing is completed before the next step is performed.

- 9) shall send a SIP 200 (OK) response to the controlling MCVideo function according to 3GPP TS 24.229 [11].

9.2.2.5.1.3 Joining an ongoing chat group call

Upon receipt of a "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" and if a chat group call is already ongoing, the non-controlling MCVideo function of an MCVideo group:

NOTE 1: The Contact header field of the SIP INVITE request contains the "isfocus" feature media tag.

- 1) shall determine if the media parameters are acceptable and the MCVideo codecs are offered in the SDP offer and if not reject the request with a SIP 488 (Not Acceptable Here) response. Otherwise, continue with the rest of the steps;
- 2) shall reject the SIP request with a SIP 403 (Forbidden) response and not process the remaining steps if:
 - a) an Accept-Contact header field does not include the g.3gpp.mcvideo media feature tag; or
 - b) an Accept-Contact header field does not include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo";
- 3) if the partner MCVideo system does not have a mutual aid relationship with the primary MCVideo system identified by the contents of the P-Asserted-Identity, shall reject the "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" with a SIP 403 (Forbidden) response, with warning text set to "128 isfocus already assigned" in a Warning header field as specified in subclause 4.4, and shall not process the remaining steps;
- 4) shall cache the content of the SIP INVITE request, if received in the Contact header field and if the specific feature tags are supported;
- 5) shall check if a Resource-Priority header field is included in the incoming SIP INVITE request and may apply any preferential treatment to the SIP request as specified in 3GPP TS 24.229 [11];
- 6) shall generate SIP 200 (OK) response to the SIP INVITE request as specified in the subclause x.x.x.x before continuing with the rest of the steps;
- 7) shall include in the SIP 200 (OK) response an SDP answer to the SDP offer in the incoming SIP INVITE request as specified in the subclause x.x.x.x;
- 8) shall instruct the media plane to initialise the switch to the non-controlling mode as specified in 3GPP TS 24.581 [5] subclause x.x.x.x;

NOTE 2: Resulting media plane processing is completed before the next step is performed.

- 9) if the media plane provided information about the current speaker(s), cache the information about the current speaker(s); and
- 10) shall send a SIP 200 (OK) response to the controlling MCVideo function according to 3GPP TS 24.229 [11].

Upon receipt of the SIP ACK request, the non-controlling MCVideo function of an MCVideo group:

- 1) if information about a current speaker(s) is cached:
 - a) shall generate a SIP INFO request as specified in subclause x.x.x.x; and
 - b) shall send the SIP INFO request to the controlling MCVideo function as specified in 3GPP TS 24.229 [11];
- 2) shall instruct the media plane to finalise the switch to the non-controlling mode as specified in 3GPP TS 24.581 [5] subclause x.x.x.x; and

Editor's Note: the need for these media plane procedures is FFS.

- 3) if at least one of the MCVideo clients in the chat group session has a subscription to the conference event package, shall subscribe to the conference event package from the controlling MCVideo function as specified in subclause 9.2.3.5.3.

9.2.2.5.1.4 Splitting an ongoing chat group call

Upon receipt of a SIP BYE request, the non-controlling MCVideo function of an MCVideo group:

- 1) if keeping the chat group call active is according to the release policy in subclause x.x.x.x, shall request media plane to switch to controlling mode as specified in 3GPP TS 24.581 [5] subclause x.x.x.x;

Editor's Note: the need for these media plane procedures is FFS.NOTE 1: Resulting media plane processing is completed before the next step is performed.

- 2) shall send a SIP 200 (OK) response to the SIP BYE request; and
- 3) if at least one MCVideo client has subscribed to the conference package, shall send a NOTIFY request to all participants with a subscription to the conference event package as specified in subclause 9.2.3.5.2.

NOTE 2: The SIP NOTIFY request will indicate that all participants, with the exception of the MCVideo users belonging to the constituent MCVideo group hosted by the non-controlling MCVideo function, have left the group session.

9.2.2.5.1.5 MCVideo client joining the temporary group chat session

When acting in the non-controlling connection mode when receiving of a "SIP INVITE request for controlling MCVideo function of an MCVideo group" containing a group identity identifying a constituent chat MCVideo group being part of the temporary group call, the non-controlling MCVideo function shall act as a controlling MCVideo function towards the MCVideo client and shall perform the actions in the subclause 9.2.2.4.1.1 with the following clarifications:

- 1) the MCVideo session identity in the Contact header field of the SIP 200 (OK) response shall be the MCVideo session identity generated by the non-controlling MCVideo function; and
- 2) the subclause 9.2.3.5.2 shall be used when sending the SIP NOTIFY request for subscriptions to the conference event package.

9.2.2.5.1.6 Receipt of a SIP re-INVITE request from an MCVideo client

Upon receipt of a SIP re-INVITE request from an MCVideo client the non-controlling MCVideo function shall act as the controlling MCVideo function and shall perform the actions in subclause 9.2.2.4.1.2.

9.2.2.5.1.7 SIP OPTIONS request authorization procedure

Upon receipt of an SIP OPTIONS request containing a P-Asserted-Identity header field containing the public service identity of a MCVideo server authorized to send the OPTIONS request, the non-controlling MCVideo function shall perform the actions in subclause 9.2.1.5.4 otherwise the non-controlling MCVideo function shall send a SIP 403 (Forbidden) response as specified in 3GPP TS 24.229.

9.2.2.5.1.8 Initiating a temporary group session

Upon receiving a "SIP INVITE request "SIP INVITE request for controlling MCVideo function of an MCVideo group" when a chat group session is not ongoing, the non-controlling MCVideo-function shall:

NOTE 1: The difference between a "SIP INVITE request "SIP INVITE request for controlling MCVideo function of an MCVideo group" and a "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" is that the latter SIP INVITE request contains the isfocus media feature tag in the Contact header field.

- 1) if unable to process the request due to a lack of resources or a risk of congestion exists, may reject the SIP INVITE request with a SIP 500 (Server Internal Error) response. The non-controlling MCVideo function may include a Retry-After header field to the SIP 500 (Server Internal Error) response as specified in IETF RFC 3261 [15]. Otherwise, continue with the rest of the steps;
- 2) shall determine if the media parameters are acceptable and the MCVideo codecs are offered in the SDP offer and if not reject the request with a SIP 488 (Not Acceptable Here) response. Otherwise, continue with the rest of the steps;
- 3) shall reject the SIP request with a SIP 403 (Forbidden) response and not process the remaining steps if:
 - a) an Accept-Contact header field does not include the g.3gpp.mcvideo media feature tag; or
 - b) an Accept-Contact header field does not include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo";
- 4) shall retrieve the group document from the group management server for the MCVideo group ID contained in the <mcvideo-request-uri> element of the application/vnd.3gpp.mcvideo-info+xml MIME body of the SIP INVITE request and carry out initial processing as specified in subclause x.x.x.x and continue with the rest of the steps if the checks in subclause x.x.x.x succeed;

NOTE 2: If the checks are not successful, the SIP response to the "SIP INVITE request "SIP INVITE request for controlling MCVideo function of an MCVideo group" is already sent in the subclause x.x.x.x.

- 5) shall cache the content of the SIP INVITE request;
- 6) shall check if a Resource-Priority header field is included in the incoming SIP INVITE request and may apply any preferential treatment to the SIP request as specified in 3GPP TS 24.229 [11];
- 7) shall authorize the MCVideo user in the <mcvideo-calling-user-id> element in the application/vnd.3gpp.mcvideo-info+xml MIME body of the "SIP INVITE request for controlling MCVideo function of an MCVideo group" as specified in subclause x.x.x.x, if the MCVideo user is unauthorized to join a chat group session, the non-controlling MCVideo function shall send a SIP 403 (Forbidden) response with the warning text set to "106 user not authorised to join chat group" in a Warning header field as specified in subclause 4.4.
- 8) shall generate a SIP INVITE request to the controlling MCVideo function as specified in subclause x.x.x.x; and
- 9) shall send the SIP INVITE request to the controlling MCVideo function as specified in 3GPP TS 24.229 [11].

Upon receipt of a SIP 2xx response to the SIP INVITE request sent to the controlling MCVideo function as specified above, the non-controlling MCVideo function:

- 1) shall send the SIP ACK request to the controlling MCVideo function as specified in 3GPP TS 24.229 [11];
- 2) shall generate a SIP 200 (OK) to the "SIP INVITE request for controlling MCVideo function of an MCVideo group" as specified in 3GPP TS 24.229 populated as follows:
 - a) shall include an SDP answer as specified in subclause x.x.x.x based on the SDP answer in the SIP 200 (OK) response;
 - b) shall include the public service identifier of the non-controlling MCVideo function in the P-Asserted-Identity header field; and
 - c) shall include the warning text set to "148 MCVideo group is regrouped" in a Warning header field as specified in subclause 4.4; and
- 3) shall start acting as a non-controlling MCVideo function and interact with the media plane as specified in 3GPP TS 24.581 [5] subclause x.x.x.x.

Upon receipt of other final SIP responses with the exception of the SIP 2xx response to the INVITE request sent to the controlling MCVideo function as specified above, the non-controlling MCVideo function:

- 1) shall send the SIP ACK response to the controlling MCVideo function as specified in 3GPP TS 24.229 [11]; and
- 2) perform the actions in the subclause 9.2.1.5.2.4.

NOTE 4: Regardless if the controlling MCVideo function accepts or rejects the SIP INVITE request sent above the prearranged group session continues to be initiated with only the members of the group homed on the non-controlling MCVideo function of the group being invited to the group call.

9.3 Off-network group call

9.3.1 General

9.3.1.1 Common Procedures

9.3.1.1.1 MONP message transport

In order to participate in a call of an MCVideo group, the MCVideo client:

- 1) shall send the MONP message as a UDP message to the multicast IP address of the MCVideo group, on UDP port TBD, with an IP time-to-live set to 255; and

Editor's note: Port number for the message is FFS.

- 2) shall treat UDP messages received on the multicast IP address of the MCVideo group and on port TBD as received MONP messages.

The MONP message is the entire payload of the UDP message.

9.3.1.1.2 Session description

For an off-network MCVideo session, only MCVideo video is used.

One off-network MCVideo session includes one media-transmission control entity.

The MCVideo client shall generate an SDP body for a group call in accordance with rules and procedures of IETF RFC 4566 [2].

The MCVideo client:

- 1) shall include in the session-level section:
 - a) the "o=" field with the <username> portion set to a dash;
 - b) the "s=" field with the <session name> portion set to a dash; and
 - c) the "c=" field with the <nettype> portion set to "IN", the <addrtype> portion set to the IP version of a multicast IP address of the MCVideo group and the <connection-address> portions set to the multicast IP address of the MCVideo group;
- 2) shall include the media-level section for MCVideo video consisting of:
 - a) the "m=" field with the <media> portion set to "video", the <port> portion set to a port number for MCVideo video of the MCVideo group, the <proto> field set to "RTP/AVP" and <fmt> portion set indicating RTP payload type numbers;
 - b) the "i=" field with the <session description> portion set to "video";
 - c) the "a=fmtp:" attribute(s), the "a=rtpmap:" attribute(s) or both, indicating the codec(s) and media parameters of the MCVideo video;

Editor's Note: Inclusion and usage of preferred video codec is FFS.

- d) the "a=rtcp:" attribute indicating port number to be used for RTCP at the MCVideo client selected according to the rules and procedures of IETF RFC 3605 [3], if the media steam uses other than the default IP address; and
- 3) shall include the media-level section for media-transmission control entity consisting of:
 - a) an "m=" line, with the <media> portion set to "application", the <port> portion set to a port number for media-transmission control entity of the MCVideo group, the <proto> field set to "udp" and <fmt> portion set to "MCVideo"; and
 - b) the "a=fmtp:MCVideo" attribute indicating the parameters of the media-transmission control entity as specified in 3GPP TS 24.581 [5];

9.3.2 Basic call control

9.3.2.1 General

In this release of specification, media streams of off-network group call cannot be modified and the SDP is the same for the entire duration of the call.

Editor's Note: limit on maximum number of simultaneous calls is FFS.

9.3.2.2 Basic call control state machine

The Figure 9.3.2.2-1 gives an overview of the main states and transitions on the UE for call control.

Each call control state machine is per MCVideo group ID.

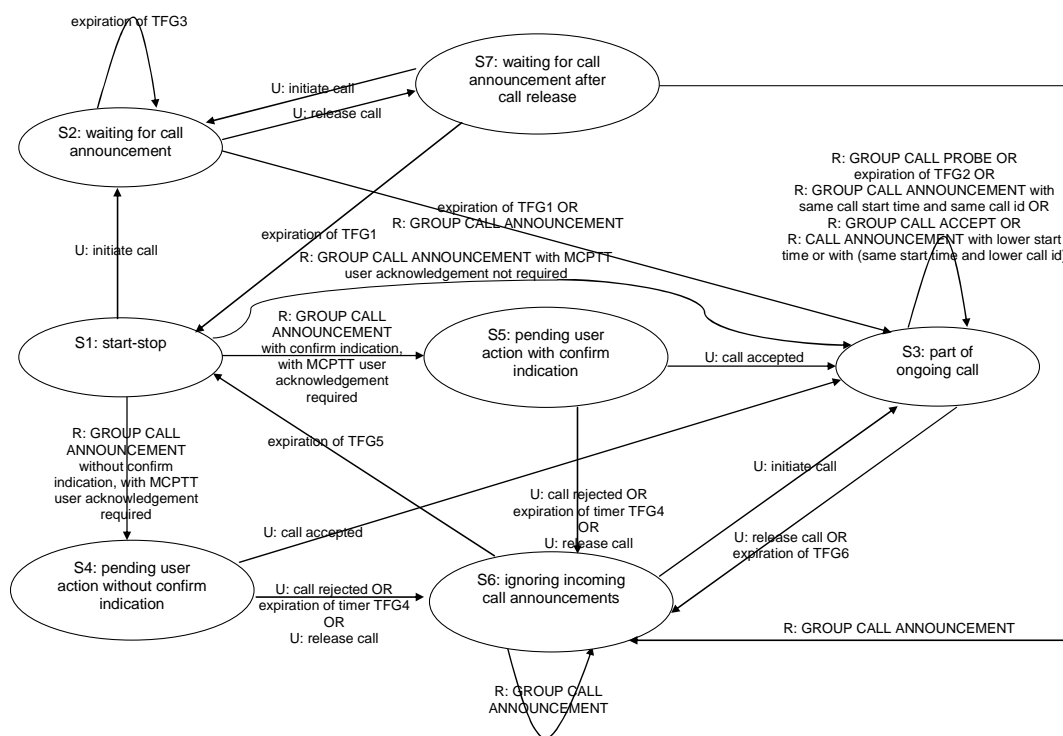


Figure 9.3.2.2-1: Basic call control state machine

The following pieces of information are associated with the basic call control state machine:

- a) the stored call identifier of the call;
- b) the probe response value of the call;
- c) the stored refresh interval of the call;
- d) the stored SDP body of the call;
- e) the stored originating MCVideo user ID of the call; and
- f) the stored MCVideo group ID of the call.

The basic call control state machine has a related call type control state machine described in subclause 9.3.3.2.

When sending the message, MCVideo client indicates the stored current ProSe per-packet priority associated with the call type control state machine to the lower layers.

9.3.2.3 Call Control states

9.3.2.3.1 S1: start-stop

This state exists for UE, when the UE is not part of an ongoing call.

This state is the start state of this state machine.

This state is the stop state of this state machine.

9.3.2.3.2 S2: waiting for call announcement

This state exists for UE, when the UE has sent a GROUP CALL PROBE message and is waiting for a GROUP CALL ANNOUNCEMENT message.

9.3.2.3.3 S3: part of ongoing call

This state exists for UE, when the UE is part of an ongoing group call.

9.3.2.3.4 S4: pending user action without confirm indication

This state exists for UE, when the UE has presented a notification to the MCVideo user for the received GROUP CALL ANNOUNCEMENT message, is waiting for a response and is not expected to send confirm indication.

9.3.2.3.5 S5: pending user action with confirm indication

This state exists for UE, when the UE has presented a notification to the MCVideo user for the received GROUP CALL ANNOUNCEMENT message, is waiting for a response and is expected to send confirm indication.

9.3.2.3.6 S6: ignoring incoming call announcements

This state exists for UE, when the group call was rejected or released, GROUP CALL ANNOUNCEMENT message was sent or received and GROUP CALL ANNOUNCEMENT messages continue being received.

9.3.2.3.7 S7: waiting for call announcement after call release

This state exists for UE, when the group call was released, GROUP CALL ANNOUNCEMENT message was neither sent nor received and GROUP CALL PROBE was sent.

9.3.2.4 Procedures

9.3.2.4.1 General

9.3.2.4.1.1 Call announcement timer calculation

9.3.2.4.1.1.1 Periodic call announcement timer calculation

The MCVideo client:

- 1) shall generate a random number, X , with uniform distribution between 0 and 1; and
- 2) shall set the TFG2 (periodic announcement) timer as follows:
 - TFG2 (periodic announcement) = the refresh interval of the call * $(2/3 + 2/3*X)$ seconds.

9.3.2.4.1.1.2 Call announcement timer calculation after CALL PROBE

The MCVideo client:

- 1) shall generate a random number, X , with uniform distribution between 0 and 1; and
- 2) shall set the TFG2 (periodic announcement) timer as follows:
 - TFG2 (periodic announcement) = $1/12*X$ seconds.

9.3.2.4.1.2 Max duration timer calculation

The MCVideo client shall set the TFG6 (max duration) timer as follows:

- TFG6 (max duration) = $X - (Y - Z)$ seconds, where:
 - X = value of "MaxDuration" leaf node present in group configuration as specified in 3GPP TS 24.483 [4];
 - Y = current UTC time, in seconds since midnight UTC of January 1, 1970 (not counting leap seconds);
 - Z = Call start time IE of the GROUP CALL ANNOUNCEMENT message.

Editor's Note: Configuration parameter path for 'MaxDuration' is FFS.

9.3.2.4.2 Call Probe

9.3.2.4.2.1 Call probe initiation

When in the "S1: start-stop" state, upon an indication from an MCVideo user to initiate a group call for an MCVideo group ID, the MCVideo client:

- 1) shall store the MCVideo group ID as the MCVideo group ID of the call;
- 2) shall create a call type control state machine as described in subclause 9.3.3.2;
- 3) shall generate a GROUP CALL PROBE message as specified in subclause 17.1.2. In the GROUP CALL PROBE message, the MCVideo client:
 - a) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call;
- 4) shall send the GROUP CALL PROBE message as specified in subclause 9.3.1.1.1;
- 5) shall start timer TFG3 (call probe retransmission);
- 6) shall start timer TFG1 (wait for call announcement); and
- 7) shall enter the "S2: waiting for call announcement" state.

9.3.2.4.2.2 Call probe retransmission

When in the "S2: waiting for call announcement" state, upon expiration of TFG3 (call probe retransmission), the MCVideo client:

- 1) shall generate a GROUP CALL PROBE message as specified in subclause 17.1.2. In the GROUP CALL PROBE message, the MCVideo client:
 - a) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call;
- 2) shall send the GROUP CALL PROBE message as specified in subclause 9.3.1.1.1;
- 3) shall start timer TFG3 (call probe retransmission); and
- 4) shall remain in the "S2: waiting for call announcement" state.

9.3.2.4.2.3 Receiving GROUP CALL PROBE message when participating in the ongoing call

When in the "S3: part of ongoing call" state, upon receiving a GROUP CALL PROBE message with the MCVideo group ID IE matching the stored MCVideo group ID of the call, the MCVideo client:

- 1) if the stored probe response value of the call is set to "false":
 - a) shall stop timer TFG2 (call announcement);
 - b) shall start timer TFG2 (call announcement) with value as specified in subclause 9.3.2.4.1.1.2; and
 - c) shall set the stored probe response of the call to "true"; and
- 2) shall remain in the "S3: part of ongoing call" state.

9.3.2.4.3 Call setup

9.3.2.4.3.1 Not receiving any response to GROUP CALL PROBE message

When in the "S2: waiting for call announcement" state, upon expiry of timer TFG1 (wait for call announcement), the MCVideo client:

- 1) shall stop timer TFG3 (call probe retransmission), if running;
- 2) shall generate an SDP body as specified in subclause 9.3.1.1.2 and store it as the SDP body of the call;
- 3) shall generate a random number with uniform distribution between 0 and 65535 and store it as the call identifier of the call;
- 4) shall select refresh interval value and store it as the refresh interval of the call;
- 5) shall store own MCVideo user ID as the originating MCVideo user ID of the call;
- 6) shall store the current UTC time as the call start time of the call;
- 7) shall generate a GROUP CALL ANNOUNCEMENT message as specified in subclause 17.1.3. In the GROUP CALL ANNOUNCEMENT message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier of the call;
 - b) shall set the Call type IE to the stored current call type associated with the call type control state machine;
 - c) shall set the Refresh interval IE to the stored refresh interval of the call;
 - d) shall set the SDP IE to the stored SDP body of the call;
 - e) shall set the Originating MCVideo user ID IE to the stored originating MCVideo user ID of the call;
 - f) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call;

- g) shall set the Call start time IE to the stored call start time of the call;
 - h) shall set the Last call type change time IE to the stored last call type change time of the call associated with call type control state machine;
 - i) shall set the Last user to change call type IE to last user to change call type associated with call type control state machine; and
 - j) may include the Confirm mode indication IE;
- 8) shall send the GROUP CALL ANNOUNCEMENT message as specified in subclause 9.3.1.1.1;
 - 9) shall establish a media session based on the stored SDP body of the call;
 - 10) shall start transmission control as originating transmission participant as specified in subclause a.b in 3GPP TS 24.581 [5];
 - 11) shall start timer TFG6 (max duration) with value as specified in subclause 9.3.2.4.1.2;
 - 12) shall start timer TFG2 (call announcement) with value as specified in subclause 9.3.2.4.1.1.1; and
 - 13) shall enter the "S3: part of ongoing call" state.

Note: In this release of the specification, the refresh interval of the call is fixed to 10 seconds.

9.3.2.4.3.2 Receiving a GROUP CALL ANNOUNCEMENT message

When in the "S2: waiting for call announcement" state, upon receiving a GROUP CALL ANNOUNCEMENT message with the MCVideo group ID IE matching the stored MCVideo group ID of the call, the MCVideo client:

- 1) shall stop timer TFG3 (call probe retransmission);
- 2) shall stop timer TFG1 (wait for call announcement);
- 3) shall store the value of the SDP IE of the GROUP CALL ANNOUNCEMENT message as the SDP body of the call;
- 4) shall store the value of the Call identifier IE of the GROUP CALL ANNOUNCEMENT message as the call identifier of the call;
- 5) shall store the value of the originating MCVideo user ID IE of the GROUP CALL ANNOUNCEMENT message as the Originating MCVideo user ID of the call;
- 6) shall store the value of the Refresh interval IE of the GROUP CALL ANNOUNCEMENT message as the refresh interval of the call;
- 7) shall store the value of the Call start time IE of the GROUP CALL ANNOUNCEMENT message as the call start time of the call;
- 8) shall establish a media session based on the stored SDP body of the call;
- 9) shall start transmission control as terminating transmission participant as specified in subclause a.b in 3GPP TS 24.581 [5];
- 10) shall start timer TFG6 (max duration) with value as specified in subclause 9.3.2.4.1.2;
- 11) shall start timer TFG2 (call announcement) with value as specified in subclause 9.3.2.4.1.1.1; and
- 12) shall enter the "S3: part of ongoing call" state.

9.3.2.4.3.3 Receiving a GROUP CALL ANNOUNCEMENT message when not participating in the ongoing call

When in the "S1: start-stop" state, upon receiving a GROUP CALL ANNOUNCEMENT message with the MCVideo group ID IE not matching MCVideo group ID of the call stored for other state machines, the MCVideo client:

- 1) shall store the value of the SDP IE of the GROUP CALL ANNOUNCEMENT message as the SDP body of the call;
- 2) shall store the value of the Call identifier IE of the GROUP CALL ANNOUNCEMENT message as the call identifier of the call;
- 3) shall store the value of the Originating MCVideo user ID IE of the GROUP CALL ANNOUNCEMENT message as the originating MCVideo user ID of the call;
- 4) shall store the value of the Refresh interval IE of the GROUP CALL ANNOUNCEMENT message as the refresh interval of the call;
- 5) shall store the value of the MCVideo group ID IE of the GROUP CALL ANNOUNCEMENT message as the MCVideo group ID of the call;
- 6) shall store the value of the Call start time IE of the GROUP CALL ANNOUNCEMENT message as the call start time of the call;
- 7) shall create a call type control state machine as described in subclause 9.3.3.2;
- 8) if the terminating UE is configured that the terminating MCVideo user acknowledgement is required upon a terminating call request reception:
 - a) shall start timer TFG4 (waiting for the user);
 - b) if the GROUP CALL ANNOUNCEMENT message contains the Confirm mode indication IE, shall enter the "S5: pending user action with confirm indication" state; and
 - c) if the GROUP CALL ANNOUNCEMENT message does not contains the Confirm mode indication IE, shall enter the "S4: pending user action without confirm indication" state; and
- 9) if the terminating UE is configured that the terminating MCVideo user acknowledgement is not required upon a terminating call request reception:
 - a) shall establish a media session based on the stored SDP body of the call;
 - b) shall start transmission control as terminating transmission participant as specified in subclause a.b in 3GPP TS 24.581 [5];
 - c) if the GROUP CALL ANNOUNCEMENT message contains the Confirm mode indication IE:
 - i) shall generate a GROUP CALL ACCEPT message as specified in subclause 17.1.4. In the GROUP CALL ACCEPT message, the MCVideo client:
 - A) shall set the Call identifier IE to the stored call identifier of the call;
 - B) shall set the Sending MCVideo user ID IE to own MCVideo user id;
 - C) shall set the Call type IE to the stored current call type associated with the call type control state machine; and
 - D) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call; and
 - ii) shall send the GROUP CALL ACCEPT message as specified in subclause 9.3.1.1.1;
 - d) shall start timer TFG6 (max duration) with value as specified in subclause 9.3.2.4.1.2;
 - e) shall start timer TFG2 (call announcement) with value as specified in subclause 9.3.2.4.1.1.1; and
 - f) shall enter the "S3: part of ongoing call" state.

9.3.2.4.3.4 MCVideo user accepts the terminating call with confirm indication

When in the "S5: pending user action with confirm indication" state, upon indication from the MCVideo user to accept the incoming group call, the MCVideo client:

- 1) shall establish a media session based on the stored SDP body of the call;

- 2) shall start transmission control as terminating transmission participant as specified in subclause a.b in 3GPP TS 24.581 [5];
- 3) shall generate a GROUP CALL ACCEPT message as specified in subclause 17.1.4. In the GROUP CALL ACCEPT message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier of the call;
 - b) shall set the Sending MCVideo user ID IE to own MCVideo user id;
 - c) shall set the Call type IE to the stored current call type associated with the call type control state machine; and
 - d) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call; and
- 4) shall send the GROUP CALL ACCEPT message as specified in subclause 9.3.1.1.1;
- 5) shall start timer TFG6 (max duration) with value as specified in subclause 9.3.2.4.1.2;
- 6) shall start timer TFG2 (call announcement) with value as specified in subclause 9.3.2.4.1.1.1; and
- 7) shall enter the "S3: part of ongoing call" state.

9.3.2.4.3.5 MCVideo user accepts the terminating call without confirm indication

When in the "S4: pending user action without confirm indication" state, upon an indication from the MCVideo user to accept the incoming group call, the MCVideo client:

- 1) shall establish a media session based on the stored SDP body of the call;
- 2) shall start transmission control as terminating transmission participant as specified in subclause a.b in 3GPP TS 24.581 [5];
- 3) shall start timer TFG6 (max duration) with value as specified in subclause 9.3.2.4.1.2;
- 4) shall start timer TFG2 (call announcement) with value as specified in subclause 9.3.2.4.1.1.1; and
- 5) shall enter the "S3: part of ongoing call" state.

9.3.2.4.3.6 Receiving GROUP CALL ACCEPT message

When in the "S3: part of ongoing call" state, upon receiving a GROUP CALL ACCEPT message with the MCVideo group ID IE matching the stored MCVideo group ID of the call, the MCVideo client:

- 1) can inform the MCVideo user about the call acceptance; and
- 2) shall remain in the "S3: part of ongoing call" state.

9.3.2.4.3.7 MCVideo user rejects the terminating call

When in the "S5: pending user action with confirm indication" state or the "S4: pending user action without confirm indication" state, upon an indication from the MCVideo user to reject the incoming group call, the MCVideo client:

- 1) shall stop timer TFG4 (waiting for the user);
- 2) shall start timer TFG5 (not present incoming call announcements); and
- 3) shall enter the "S6: ignoring incoming call announcements" state.

9.3.2.4.3.8 MCVideo user does not act on terminating call

When in the "S5: pending user action with confirm indication" state or the "S4: pending user action without confirm indication" state, upon expiration of timer TFG4 (waiting for the user), the MCVideo client:

- 1) shall start timer TFG5 (not present incoming call announcements); and

- 2) shall enter the "S6: ignoring incoming call announcements" state.

9.3.2.4.4 Periodic group call announcement

9.3.2.4.4.1 Sending periodic call announcement

When in the "S3: part of ongoing call" state, upon expiry of timer TFG2 (call announcement), the MCVideo client:

- 1) shall generate a GROUP CALL ANNOUNCEMENT message as specified in subclause 17.1.3. In the GROUP CALL ANNOUNCEMENT message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier of the call;
 - b) shall set the Call type IE to the stored current call type associated with the call type control state machine;
 - c) shall set the Refresh interval IE to the stored refresh interval of the call;
 - d) shall set the SDP IE to the stored SDP body of the call;
 - e) shall set the Originating MCVideo user ID IE to the stored originating MCVideo user ID of the call;
 - f) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call;
 - g) shall set the Last call type change time IE to the stored last call type change time of the call associated with call type control state machine;
 - h) shall set the Last user to change call type IE to last user to change call type associated with call type control state machine;
 - i) shall set the Call start time IE to the stored call start time of the call;
 - j) if the stored probe response value of the call is set to "true", shall include Probe response IE;
- 2) shall send the GROUP CALL ANNOUNCEMENT message as specified in subclause 9.3.2.1.1.1;
- 3) if the stored probe response value of the call is set to "true", shall set the stored probe response value of the call to "false";
- 4) shall start timer TFG2 (call announcement) with value as specified in subclause 9.3.2.4.1.1.1; and
- 5) shall remain in the "S3: part of ongoing call" state.

9.3.2.4.4.2 Receiving periodic call announcement

When in the "S3: part of ongoing call" state, upon receiving a GROUP CALL ANNOUNCEMENT message with the MCVideo group ID IE matching the stored MCVideo group ID of the call, the Call start time IE being the same as the stored call start time of the call, the Last call type change time IE being the same as the stored last call type change time of the call associated with the call type control state machine, the Last user to change call type IE being the same as the stored last user to change call type of the call associated with the call type control state machine and the Call identifier IE being the same as the stored call identifier of the call and Call type IE same as the stored current call type associated with the call type control state machine and:

- 1) if the stored probe response value of the call is set to "true" and GROUP CALL ANNOUNCEMENT message contains Probe response IE; or
- 2) if the stored probe response value of the call is set to "false":

the MCVideo client,

- 1) shall stop timer TFG2 (call announcement);
- 2) shall start timer TFG2 (call announcement) with value as specified in subclause 9.3.2.4.1.1.1;
- 3) shall set the stored probe response of the call to "false", if set to "true"; and
- 4) shall remain in the "S3: part of ongoing call" state.

9.3.2.4.5 Call release

9.3.2.4.5.1 MCVideo user leaves the call when GROUP CALL ANNOUNCEMENT was sent or received

When in the "S3: part of ongoing call" state, the "S5: pending user action with confirm indication" state, or the "S4: pending user action without confirm indication" state, upon an indication from the MCVideo user to release the group call, the MCVideo client:

- 1) shall release the media session, if established;
- 2) shall stop timer TFG4 (waiting for the user), if running;
- 3) shall stop timer TFG2 (call announcement), if running;
- 4) shall start timer TFG5 (not present incoming call announcements); and
- 5) shall enter the "S6: ignoring incoming call announcements" state.

9.3.2.4.5.2 Receiving GROUP CALL ANNOUNCEMENT message for rejected or released call

When in the "S6: ignoring incoming call announcements" state, upon receiving a GROUP CALL ANNOUNCEMENT message with the MCVideo group ID IE matching the stored MCVideo group ID of the call, the MCVideo client:

- 1) shall store the value of the SDP IE of the GROUP CALL ANNOUNCEMENT message as the SDP body of the call;
- 2) shall store the value of the Call identifier IE of the GROUP CALL ANNOUNCEMENT message as the call identifier of the call;
- 3) shall store the value of the Originating MCVideo user ID IE of the GROUP CALL ANNOUNCEMENT message as the originating MCVideo user ID of the call;
- 4) shall store the value of the Refresh interval IE of the GROUP CALL ANNOUNCEMENT message as the refresh interval of the call;
- 5) shall store the value of the Call start time IE of the GROUP CALL ANNOUNCEMENT message as the call start time of the call;
- 6) shall stop timer TFG5 (not present incoming call announcements);
- 7) shall start timer TFG5 (not present incoming call announcements); and
- 8) shall remain in the "S6: ignoring incoming call announcements" state.

9.3.2.4.5.3 MCVideo user initiates originating call for rejected or released call

When in the "S6: ignoring incoming call announcements" state, upon an indication from the MCVideo user to initiate a group call for an MCVideo group ID matching the stored MCVideo group ID of the call, the MCVideo client:

- 1) stop timer TFG5 (not present incoming call announcements);
- 2) shall establish a media session based on the stored SDP body of the call;
- 3) shall start transmission control as terminating transmission participant as specified in subclause a.b in 3GPP TS 24.581 [5];
- 4) shall start timer TFG6 (max duration) with value as specified in subclause 9.3.2.4.1.2;
- 5) shall start timer TFG2 (call announcement) with value as specified in subclause 9.3.2.4.1.1.1; and
- 6) shall enter the "S3: part of ongoing call" state.

9.3.2.4.5.4 No GROUP CALL ANNOUNCEMENT messages for rejected or released call

When in the "S6: ignoring incoming call announcements" state, upon expiration of timer TFG5 (not present incoming call announcements), the MCVideo client:

- 1) shall release the stored SDP body of the call;
- 2) shall release the stored call identifier of the call;
- 3) shall release the stored originating MCVideo user ID of the call;
- 4) shall release the stored refresh interval of the call;
- 5) shall release the stored MCVideo group ID of the call;
- 6) shall release the call start time of the call;
- 7) shall destroy the call type control state machine; and
- 8) shall enter the "S1: start-stop" state.

9.3.2.4.5.5 MCVideo user leaves the call when GROUP CALL PROBE was sent

When in the "S2: waiting for call announcement" state, upon an indication from the MCVideo user to release the group call, the MCVideo client:

- 1) shall stop timer TFG3 (call probe retransmission); and
- 2) shall enter the "S7: Waiting for call announcement after call release" state.

9.3.2.4.5.6 MCVideo user initiates originating call for released call

When in the "S7: Waiting for call announcement after call release" state, upon an indication from the MCVideo user to initiate a group call for an MCVideo group ID matching the stored MCVideo group ID of the call, the MCVideo client:

- 1) shall stop timer TFG1 (wait for call announcement);
- 2) shall generate a GROUP CALL PROBE message as specified in subclause 17.1.2. In the GROUP CALL PROBE message, the MCVideo client:
 - a) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call; and
- 3) shall send the GROUP CALL PROBE message as specified in subclause 9.3.1.1.1;
- 4) shall start timer TFG3 (call probe retransmission);
- 5) shall start timer TFG1 (wait for call announcement); and
- 6) shall enter the "S2: waiting for call announcement" state.

9.3.2.4.5.7 Receiving GROUP CALL ANNOUNCEMENT message for released call

When in the "S7: Waiting for call announcement after call release" state, upon receiving a GROUP CALL ANNOUNCEMENT message with the MCVideo group ID IE matching the stored MCVideo group ID of the call, the MCVideo client:

- 1) shall store the value of the SDP IE of the GROUP CALL ANNOUNCEMENT message as the SDP body of the call;
- 2) shall store the value of the Call identifier IE of the GROUP CALL ANNOUNCEMENT message as the call identifier of the call;
- 3) shall store the value of the Originating MCVideo user ID IE of the GROUP CALL ANNOUNCEMENT message as the originating MCVideo user ID of the call;

- 4) shall store the value of the Refresh interval IE of the GROUP CALL ANNOUNCEMENT message as the refresh interval of the call;
- 5) shall store the value of the Call start time IE of the GROUP CALL ANNOUNCEMENT message as the call start time of the call;
- 6) shall stop timer TFG1 (wait for call announcement);
- 7) shall start timer TFG5 (not present incoming call announcements); and
- 8) shall enter the "S6: ignoring incoming call announcements" state.

9.3.2.4.5.8 No GROUP CALL ANNOUNCEMENT messages for released call

When in the "S7: Waiting for call announcement after call release" state, upon expiration of timer TFG1 (wait for call announcement), the MCVideo client:

- 1) shall release the stored MCVideo group ID of the call;
- 2) shall destroy the call type control state machine; and
- 3) shall enter the "S1: start-stop" state.

9.3.2.4.5.9 Max duration reached

When in the "S3: part of ongoing call" state, upon expiration of timer TFG6 (max duration), the MCVideo client:

- 1) shall release the media session;
- 2) shall stop timer TFG2 (call announcement), if running;
- 3) shall start timer TFG5 (not present incoming call announcements); and
- 4) shall enter the "S6: ignoring incoming call announcements" state.

9.3.2.4.6 Merge of calls

9.3.2.4.6.1 Merge of two calls

When in the "S3: part of ongoing call" state, upon receiving a GROUP CALL ANNOUNCEMENT message with the MCVideo group ID IE matching the stored MCVideo group ID of the call and:

- 1) the Originating MCVideo user ID IE is different from the stored originating MCVideo user ID of the call; or
- 2) the Call identifier IE is different from the stored call identifier of the call;

then:

- 1) if the stored current call type associated with the call type control state machine is "BASIC GROUP CALL" and the value of the Call type IE of GROUP CALL ANNOUNCEMENT message is either "IMMINENT PERIL GROUP CALL" or "EMERGENCY GROUP CALL";
- 2) if the stored current call type associated with the call type control state machine is "IMMINENT PERIL GROUP CALL" and the value of the Call type IE of GROUP CALL ANNOUNCEMENT message is "EMERGENCY GROUP CALL";
- 3) if the stored current call type associated with the call type control state machine being equal to the Call type IE of the GROUP CALL ANNOUNCEMENT message and the Call start time IE of the GROUP CALL ANNOUNCEMENT message being lower than the stored call start time of the call; or
- 4) if the stored current call type associated with the call type control state machine being equal to the Call type IE of the GROUP CALL ANNOUNCEMENT message and the Call start time IE of the GROUP CALL ANNOUNCEMENT message being equal to the stored call start time of the call and the Call identifier IE of the GROUP CALL ANNOUNCEMENT message being lower than the stored call identifier of the call;

the MCVideo client:

- 1) shall store the value of the SDP IE of the GROUP CALL ANNOUNCEMENT message as the SDP body of the call;
- 2) shall store the value of the Call identifier IE of the GROUP CALL ANNOUNCEMENT message as the call identifier of the call;
- 3) shall store the value of the Originating MCVideo user ID IE of the GROUP CALL ANNOUNCEMENT message as the originating MCVideo user ID of the call;
- 4) shall store the value of the Refresh interval IE of the GROUP CALL ANNOUNCEMENT message as the refresh interval of the call;
- 5) shall store the value of the Call start time IE of the GROUP CALL ANNOUNCEMENT message as the call start time of the call;
- 6) shall adjust the media session based on the stored SDP body of the call and restart transmission control as terminating transmission participant as specified in subclause a.b in 3GPP TS 24.581 [5];
- 7) shall stop timer TFG6 (max duration);
- 8) shall start timer TFG6 (max duration) with value as specified in subclause 9.3.2.4.1.2;
- 9) shall stop timer TFG2 (call announcement); and
- 10) shall start timer TFG2 (call announcement) with value according to rules and procedures as specified in subclause 9.3.2.4.1.1.1; and
- 11) shall remain in the "S3: part of ongoing call" state.

9.3.2.4.7 Error handling

9.3.2.4.7.1 Unexpected MONP message received

Upon receiving a MONP message in a state where there is no handling specified for the MONP message, the MCVideo client shall discard the MONP message.

9.3.2.4.7.2 Unexpected indication from MCVideo user

Upon receiving an indication from the MCVideo user in a state where there is no handling specified for the indication, the MCVideo client shall ignore the indication.

9.3.2.4.7.3 Unexpected expiration of a timer

Upon expiration of a timer in a state where there is no handling specified for expiration of the timer, the MCVideo client shall ignore the expiration of the timer.

9.3.3. Call type control

9.3.3.1 General

This state machine exists in parallel with the basic call control state machine for off-network group call as specified in subclause 9.3.2.2.

9.3.3.2 Call type control state machine

The Figure 9.3.3.2-1 gives an overview of the states and transitions of the state machine.

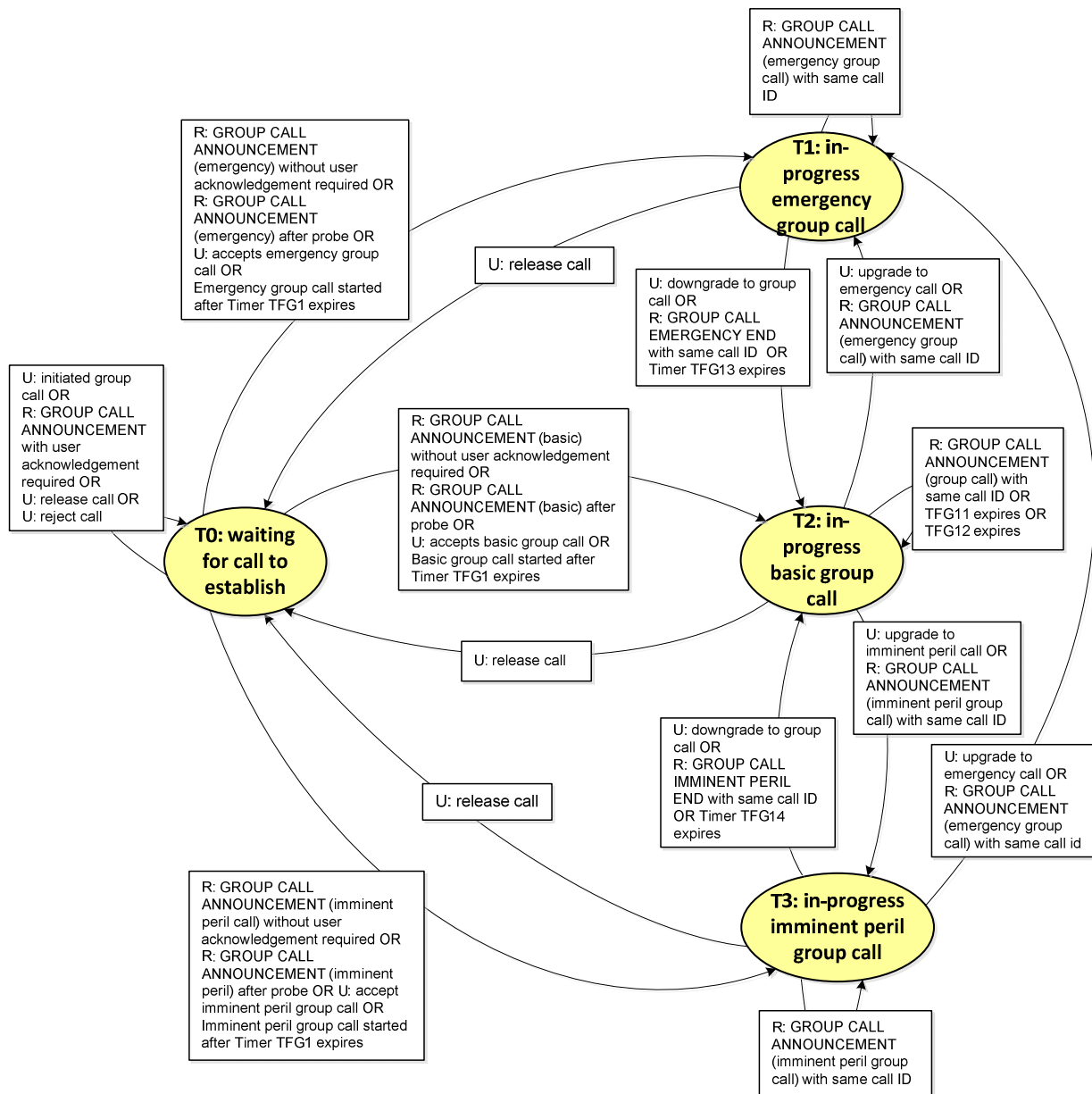


Figure 9.3.3.2-1: Call type control state machine

The following pieces of information are associated with the call type control state machine:

- a) the stored current call type;
- b) the stored current ProSe per-packet priority;
- c) the stored last call type change time of the call; and
- d) the stored last user to change call type of the call.

When sending the message, MCVideo client indicates the stored current ProSe per-packet priority (as described in 3GPP TS 24.483 [4]) associated with the call type control state machine to the lower layers.

9.3.3.3 Call type control states

9.3.3.3.1 T0: waiting for call to establish

This state is the start state of this state machine.

9.3.3.3.2 T1: in-progress emergency group call

This state exists for UE, when the UE is part of an in-progress emergency group call.

9.3.3.3.3 T2: in-progress basic group call

This state exists for UE, when the UE is part of an in-progress basic group call.

9.3.3.3.4 T3: in-progress imminent peril group call

This state exists for UE, when the UE is part of an in-progress imminent peril group call.

9.3.3.4 Procedures

9.3.3.4.1 General

9.3.3.4.1.1 Implicit downgrade (emergency) timer calculation

The MCVideo client shall set the TFG13 (implicit downgrade emergency) timer as follows:

1) TFG13 (implicit downgrade emergency) = $X - (Y - Z)$ seconds, where:

a) X = value of "EmergencyCallCancel" leaf node present in group configuration as specified in 3GPP TS 24.483 [4];

Editor's Note: Configuration parameter path for EmergencyCallCancel is FFS.

b) Y = current UTC time, in seconds since midnight UTC of January 1, 1970 (not counting leap seconds); and

c) Z = Last call type change time IE of the GROUP CALL ANNOUNCEMENT message or the Last call type change time IE of the GROUP CALL PRIORITY ENDED message.

9.3.3.4.1.2 Implicit downgrade (imminent peril) timer calculation

The MCVideo client shall set the TFG14 (implicit downgrade imminent peril) timer as follows:

1) TFG14 (implicit downgrade imminent peril) = $X - (Y - Z)$ seconds, where:

a) X = value of "ImminentPerilCallCancel" leaf node present in group configuration as specified in 3GPP TS 24.483 [4];

Editor's Note: Configuration parameter path for ImminentPerilCallCancel is FFS.

b) Y = current UTC time, in seconds since midnight UTC of January 1, 1970 (not counting leap seconds); and

c) Z = Last call type change time IE of the GROUP CALL ANNOUNCEMENT message or the Last call type change time IE of the GROUP CALL PRIORITY ENDED message.

9.3.3.4.2 User initiated the call probe

When in the "T0: waiting for the call to establish" state, upon an indication from an MCVideo user to initiate a group call probe for an MCVideo group, the MCVideo client:

1) if the stored emergency state associated with emergency alert state machine described in 11.3.2.2 is set to "true":

Editor's Note: Authorization check for emergency call is FFS.

a) shall set the stored current call type to "EMERGENCY GROUP CALL"; and

b) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network emergency group call as described in 3GPP TS 24.483 [4];

- 2) if the stored emergency state associated with emergency alert state machine described in 11.3.2.2 is set to "false", and:
 - a) if the user initiates an MCVideo emergency call and the values of:

Editor's Note: Authorization check for emergency call and applicability check on the group is FFS.

- i) shall set the stored current call type to "EMERGENCY GROUP CALL"; and
 - ii) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network emergency group call as described in 3GPP TS 24.483 [4];
- b) if the user initiates an MCVideo imminent peril group call:

Editor's Note: Authorization check for imminent peril call and applicability check on the group is FFS.

- i) shall set the stored current call type to "IMMINENT PERIL GROUP CALL"; and
 - ii) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network imminent peril group call as described in 3GPP TS 24.483 [4]; and
- c) if the user initiates an MCVideo group call which is not an MCVideo emergency call and which is not an MCVideo imminent peril group call:
 - i) shall set the stored current call type to "BASIC GROUP CALL"; and
 - ii) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network basic group call as described in 3GPP TS 24.483 [4];
- 3) shall set the stored last call type change time to current UTC time;
 - 4) shall set the last user to change call type to own MCVideo user ID; and
 - 5) shall remain in "T0: waiting for the call to establish" state.

9.3.3.4.3 Received GROUP CALL ANNOUNCEMENT message as a response to GROUP CALL PROBE message

When in the "T0: waiting for the call to establish" state, upon receipt of a GROUP CALL ANNOUNCEMENT message as a response to GROUP CALL PROBE message, the MCVideo client:

- 1) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "EMERGENCY GROUP CALL":
 - a) shall set the stored current call type to "EMERGENCY GROUP CALL";
 - b) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network emergency group call as described in 3GPP TS 24.483 [4];
 - c) shall set the stored last call type change time to the Last call type change time IE of the GROUP CALL ANNOUNCEMENT message;
 - d) shall set the stored last user to change call type to the Last user to change call type IE of the GROUP CALL ANNOUNCEMENT message;
 - d) shall start timer TFG13 (implicit downgrade emergency) with value as specified in subclause 9.3.3.4.1.1; and
 - e) shall enter "T1: in-progress emergency group call" state;
- 2) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "IMMINENT PERIL GROUP CALL", and if the stored current call type is other than "EMERGENCY GROUP CALL":
 - a) shall set the stored current call type to "IMMINENT PERIL GROUP CALL";
 - b) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network imminent peril group call as described in 3GPP TS 24.483 [4];

- c) shall set the stored last call type change time to the Last call type change time IE of the GROUP CALL ANNOUNCEMENT message;
 - d) shall set the stored last user to change call type to the Last user to change call type IE of the GROUP CALL ANNOUNCEMENT message;
 - e) shall start timer TFG14 (implicit downgrade imminent peril) with value as specified in subclause 9.3.3.4.1.2; and
 - f) shall enter "T3: in-progress imminent peril group call" state; and
- 3) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "BASIC GROUP CALL", and if the stored current call type is "BASIC GROUP CALL":
- a) shall set the stored last call type change time to the Last call type change time IE of the GROUP CALL ANNOUNCEMENT message;
 - b) shall set the stored last user to change call type to the Last user to change call type IE of the GROUP CALL ANNOUNCEMENT message; and
 - c) shall enter "T2: in-progress basic group call" state.

9.3.3.4.4 Received GROUP CALL ANNOUNCEMENT with MCVideo user acknowledgement required

When in the "T0: waiting for the call to establish" state, upon receipt of a GROUP CALL ANNOUNCEMENT message by an idle MCVideo client when MCVideo user acknowledgement is required, the MCVideo client:

- 1) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "EMERGENCY GROUP CALL":
 - a) shall set the stored current call type to "EMERGENCY GROUP CALL"; and
 - b) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network emergency group call as described in 3GPP TS 24.483 [4];
- 2) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "IMMINENT PERIL GROUP CALL":
 - a) shall set the stored current call type to "IMMINENT PERIL GROUP CALL";
 - b) shall start timer TFG13 (implicit downgrade); and
 - c) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network imminent peril group call as described in 3GPP TS 24.483 [4];
- 3) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "BASIC GROUP CALL":
 - a) shall set the stored current call type to "BASIC GROUP CALL";
 - b) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network basic group call as described in 3GPP TS 24.483 [4];
- 4) shall set the stored last call type change time to the Last call type change time IE of the GROUP CALL ANNOUNCEMENT message;
- 5) shall set the last user to change call type to the Last user to change call type IE of the GROUP CALL ANNOUNCEMENT message; and
- 6) shall remain in "T0: waiting for the call to establish" state.

9.3.3.4.5 Received GROUP CALL ANNOUNCEMENT without MCVideo user acknowledgement required

When in the "T0: waiting for the call to establish" state, upon receipt of a GROUP CALL ANNOUNCEMENT message by an idle MCVideo client when MCVideo user acknowledgement is not required, the MCVideo client:

- 1) shall set the stored last call type change time to the Last call type change time IE of the GROUP CALL ANNOUNCEMENT message;
- 2) shall set the last user to change call type to the Last user to change call type IE of the GROUP CALL ANNOUNCEMENT message;
- 3) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "EMERGENCY GROUP CALL":
 - a) shall set the stored current call type to "EMERGENCY GROUP CALL";
 - b) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network emergency group call as described in 3GPP TS 24.483 [4];
 - c) shall start timer TFG13 (implicit downgrade emergency) with value as specified in subclause 9.3.3.4.1.1; and
 - d) shall enter "T1: in-progress emergency group call" state;
- 4) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "IMMINENT PERIL GROUP CALL":
 - a) shall set the stored current call type to "IMMINENT PERIL GROUP CALL";
 - b) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network imminent peril group call as described in 3GPP TS 24.483 [4];
 - c) shall start timer TFG14 (implicit downgrade imminent peril) with value as specified in subclause 9.3.3.4.1.2; and
 - d) shall enter "T3: in-progress imminent peril group call" state; and
- 5) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "BASIC GROUP CALL":
 - a) shall set the stored current call type to "BASIC GROUP CALL";
 - b) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network basic group call as described in 3GPP TS 24.483 [4]; and
 - c) shall enter "T2: in-progress basic group call" state.

9.3.3.4.6 Call started

When in state "T0: waiting for the call to establish", if:

- a) the MCVideo user accepts the call when MCVideo user acknowledgement is required; or
- b) the MCVideo client sends a GROUP CALL ANNOUNCEMENT message on expiry of timer TFG1 (wait for call announcement) associated with the basic call control state machine;

the MCVideo client:

- 1) if the stored current call type is set to "EMERGENCY GROUP CALL"
 - a) shall start timer TFG13 (implicit downgrade emergency) with value as specified in subclause 9.3.3.4.1.1; and
 - b) shall enter "T1: in-progress emergency group call" state;
- 2) if the stored current call type is set to "IMMINENT PERIL GROUP CALL"

- a) shall start timer TFG14 (implicit downgrade imminent peril) with value as specified in subclause 9.3.3.4.1.2; and
 - b) shall enter "T3: in-progress imminent peril group call" state; or
- 3) if the stored current call type is set to "BASIC GROUP CALL"
- a) shall enter "T2: in-progress basic group call" state.

9.3.3.4.7 Upgrade call

9.3.3.4.7.1 Originating user upgrading the call

When in the "T2: in-progress basic group call" state, upon receiving an indication from the user to upgrade the call to "IMMINENT PERIL GROUP CALL" or "EMERGENCY GROUP CALL" or when in the "T3: in-progress imminent peril group call" state, upon receiving an indication from the user to upgrade the call to "EMERGENCY GROUP CALL", the MCVideo client:

- 1) if the user request is to upgrade the call to "EMERGENCY GROUP CALL":

Editor's Note: Authorization check for emergency call and applicability check on the group is FFS.

- a) shall set the stored current call type to "EMERGENCY GROUP CALL";
- b) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network emergency group call as described in 3GPP TS 24.483 [4];
- c) shall start timer TFG13 (implicit downgrade emergency) with value as specified in subclause 9.3.3.4.1.1;
- d) shall stop timer TFG14 (implicit downgrade imminent peril), if running; and
- e) shall enter "T1: in-progress emergency group call" state;

- 2) if the user request is to upgrade the call to "IMMINENT PERIL GROUP CALL":

Editor's Note: Authorization check for imminent peril call and applicability check on the group is FFS.

- a) shall set the stored current call type to "IMMINENT PERIL GROUP CALL";
 - b) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network imminent peril group call as described in 3GPP TS 24.483 [4];
 - c) shall start timer TFG14 (implicit downgrade imminent peril) with value as specified in subclause 9.3.3.4.1.2 and
 - d) shall enter "T3: in-progress imminent peril group call" state;
- 3) shall store the current UTC time as last call type change time of the call;
 - 4) shall store own MCVideo user ID as last user to change call type of the call;
 - 5) shall generate a GROUP CALL ANNOUNCEMENT message as specified in subclause 17.1.3. In the GROUP CALL ANNOUNCEMENT message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier of the call associated with the basic call control state machine;
 - b) shall set the Call type IE to the stored current call type;
 - c) shall set the Refresh interval IE to the stored refresh interval of the call associated with the basic call control state machine;
 - d) shall set the SDP IE to the stored SDP body of the call associated with the basic call control state machine;
 - e) shall set the Originating MCVideo user ID IE to the stored originating MCVideo user ID of the call associated with the basic call control state machine;

- f) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call associated with the basic call control state machine;
 - g) shall set the call start time IE to the stored call start time of the call;
 - h) shall set the Last call type change time IE to the stored last call type change time of the call; and
 - i) shall set the Last user to change call type IE to the stored last user to change call type of the call; and
- 6) shall send the GROUP CALL ANNOUNCEMENT message as specified in subclause 9.3.1.1.1;

9.3.3.4.7.2 Terminating UE receiving a GROUP CALL ANNOUNCEMENT message when participating in the ongoing call

When in the "T1: in-progress emergency group call" state or "T2: in-progress basic group call" state or "T3: in-progress imminent peril group call" state, upon receiving a GROUP CALL ANNOUNCEMENT message with the MCVideo group ID IE matching with MCVideo group ID of the ongoing call and the Call Identifier IE being the same as the stored call identifier of the call, the MCVideo client:

- 1) if the stored last user to change call type of the call is same as the Last user to change call type IE of the GROUP CALL ANNOUNCEMENT message and the stored last call type change time is smaller than Last call type change time IE of the GROUP CALL ANNOUNCEMENT message:
 - a) shall set the stored last call type change time of the call to Last call type change time IE of the GROUP CALL ANNOUNCEMENT message;
 - b) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "EMERGENCY GROUP CALL" and the stored call type is other than "EMERGENCY GROUP CALL":
 - i) shall set the stored current call type to "EMERGENCY GROUP CALL";
 - ii) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network emergency group call as described in 3GPP TS 24.483 [4];
 - iii) shall stop timer TFG14 (implicit downgrade imminent peril), if running;
 - iv) shall start timer TFG13 (implicit downgrade emergency) with value as specified in subclause 9.3.3.4.1.1; and
 - v) shall enter "T1: in-progress emergency group call" state;
 - c) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "IMMINENT PERIL GROUP CALL" and the stored call type is other than "IMMINENT PERIL GROUP CALL":
 - i) shall set the stored current call type to "IMMINENT PERIL GROUP CALL";
 - ii) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network imminent peril group call as described in 3GPP TS 24.483 [4];
 - iii) shall start timer TFG14 (implicit downgrade imminent peril) with value as specified in subclause 9.3.3.4.1.2; and
 - iv) shall enter "T3: in-progress imminent peril group call" state; and
 - d) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "BASIC GROUP CALL" and the stored call type is other than "BASIC GROUP CALL":
 - i) shall set the stored current call type to "BASIC GROUP CALL";
 - ii) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network basic group call as described in 3GPP TS 24.483 [4];
 - iii) shall stop timer TFG13 (implicit downgrade), if running; and
 - iv) shall enter "T2: in-progress basic group call" state; and

- 2) if the stored last user to change call type of the call is different from the Last user to change call type IE of the GROUP CALL ANNOUNCEMENT message and:
 - a) if the stored call type is same as Call type IE in the received GROUP CALL ANNOUNCEMENT message and the stored last call type change time is smaller than Last call type change time IE of the GROUP CALL ANNOUNCEMENT message:
 - i) shall set the stored last call type change time of the call to Last call type change time IE of the GROUP CALL ANNOUNCEMENT message; and
 - ii) shall set the stored last user to change call type of the call to Last user to change call type IE of the GROUP CALL ANNOUNCEMENT message;
 - b) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "EMERGENCY GROUP CALL" and the stored call type is other than "EMERGENCY GROUP CALL":
 - i) shall set the stored last call type change time of the call to Last call type change time IE of the GROUP CALL ANNOUNCEMENT message;
 - ii) shall set the stored last user to change call type of the call to Last user to change call type IE of the GROUP CALL ANNOUNCEMENT message;
 - iii) shall set the stored current call type to "EMERGENCY GROUP CALL";
 - iv) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network emergency group call as described in 3GPP TS 24.483 [4];
 - v) shall stop timer TFG14 (implicit downgrade imminent peril), if running;
 - vi) shall start timer TFG13 (implicit downgrade emergency) with value as specified in subclause 9.3.3.4.1.1; and
 - vii) shall enter "T1: in-progress emergency group call" state; and
 - c) if the Call type IE of the received GROUP CALL ANNOUNCEMENT message is set to "IMMINENT PERIL GROUP CALL" and the stored call type is "BASIC GROUP CALL":
 - i) shall set the stored last call type change time of the call to Last call type change time IE of the GROUP CALL ANNOUNCEMENT message;
 - ii) shall set the stored last user to change call type of the call to Last user to change call type IE of the GROUP CALL ANNOUNCEMENT message;
 - iii) shall set the stored current call type to "IMMINENT PERIL GROUP CALL";
 - iv) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network imminent peril group call as described in 3GPP TS 24.483 [4];
 - v) shall start timer TFG14 (implicit downgrade imminent peril) with value as specified in subclause 9.3.3.4.1.2; and
 - vi) shall enter "T3: in-progress imminent peril group call" state.

9.3.3.4.8 Downgrade call

9.3.3.4.8.1 Originating user downgrading emergency group call

When in the "T1: in-progress emergency group call" state, upon receiving an indication from:

- 1) the MCVideo user who upgraded the MCVideo group call; or
- 2) an authorized MCVideo user,

to downgrade "EMERGENCY GROUP CALL", the MCVideo client:

Editor's Note: Authorization check is FFS.

- 1) shall set the stored current call type to "BASIC GROUP CALL";
- 2) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network basic group call as described in 3GPP TS 24.483 [4];
- 3) shall set current UTC time as last call type change time of the call;
- 4) shall store own MCVideo user ID as last user to change call type of the call;
- 5) shall generate a GROUP CALL EMERGENCY END message as specified in subclause 17.1.13. In the GROUP CALL EMERGENCY END message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier of the call associated with the basic call control state machine;
 - b) shall set the Originating MCVideo user ID IE to the stored originating MCVideo user ID of the call associated with the basic call control state machine;
 - c) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call associated with the basic call control state machine;
 - d) shall set the Last call type change time IE to the stored last call type change time of the call; and
 - e) shall set the Last user to change call type IE to the stored last user to change call type of the call;
- 6) shall send the GROUP CALL EMERGENCY END message as specified in subclause 9.3.1.1.1;
- 7) shall stop timer TFG13 (implicit downgrade emergency);
- 8) shall initialize the counter CFG11 (emergency end retransmission) with value set to 1;
- 9) shall start timer TFG11 (emergency end retransmission); and
- 10) shall enter the "T2: in-progress basic group call" state.

9.3.3.4.8.2 Retransmitting GROUP CALL EMERGENCY END

When in the "T2: in-progress basic group call" state, upon expiry of timer TFG11 (emergency end retransmission), the MCVideo client:

- 1) shall generate a GROUP CALL EMERGENCY END message as specified in subclause 17.1.13. In the GROUP CALL EMERGENCY END message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier of the call associated with the basic call control state machine;
 - b) shall set the Originating MCVideo user ID IE to the stored originating MCVideo user ID of the call associated with the basic call control state machine;
 - c) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call associated with the basic call control state machine;
 - d) shall set the Last call type change time IE to the stored last call type change time of the call; and
 - e) shall set the Last user to change call type IE to the stored last user to change call type of the call;
- 2) shall send the GROUP CALL EMERGENCY END message as specified in subclause 9.3.1.1.1;
- 3) shall increment the value of the counter CFG11 (emergency end retransmission) by 1;
- 4) shall start timer TFG11 (emergency end retransmission) if the value of the associated counter CFG11 (emergency end retransmission) is less than the upper limit; and
- 5) shall remain in "T2: in-progress basic group call" state.

9.3.3.4.8.3 Terminating user downgrading emergency group call

When in the "T1: in-progress emergency group call" state, upon receiving GROUP CALL EMERGENCY END message, the MCVideo client:

- 1) shall set the stored last call type change time to the Last call type change time IE of the received GROUP CALL EMERGENCY END message;
- 2) shall set the stored last user to change call type to the Last user to change call type IE of the received GROUP CALL EMERGENCY END message;
- 3) shall set the stored current call type to "BASIC GROUP CALL";
- 4) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network basic group call as described in 3GPP TS 24.483 [4];
- 5) shall stop timer TFG13 (implicit downgrade emergency); and
- 6) shall enter the "T2: in-progress basic group call" state.

9.3.3.4.8.4 Originating user downgrading imminent peril group call

When in the "T3: in-progress imminent peril group call" state, upon receiving an indication from:

- 1) the MCVideo user who upgraded the call; or
- 2) an authorized user,

to downgrade "IMMINENT PERIL GROUP CALL", the MCVideo client:

Editor's Note: Authorization check is FFS.

- 1) shall set the stored current call type to "BASIC GROUP CALL";
- 2) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network basic group call as described in 3GPP TS 24.483 [4];
- 3) shall set current UTC time as last call type change time of the call;
- 4) shall store own MCVideo user ID as last user to change call type of the call;
- 5) shall generate a GROUP CALL IMMINENT PERIL END message as specified in subclause 17.1.12. In the GROUP CALL IMMINENT PERIL END message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier of the call associated with the basic call control state machine;
 - b) shall set the Originating MCVideo user ID IE to the stored originating MCVideo user ID of the call associated with the basic call control state machine;
 - c) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call associated with the basic call control state machine;
 - d) shall set the Last call type change time IE to the stored last call type change time of the call; and
 - e) shall set the Last user to change call type IE to the stored last user to change call type of the call;
- 6) shall send the GROUP CALL IMMINENT PERIL END message as specified in subclause 9.3.1.1.1;
- 7) shall stop timer TFG14 (implicit downgrade imminent peril);
- 8) shall initialize the counter CFG12 (imminent peril end retransmission) with value set to 1;
- 9) shall start timer TFG12 (imminent peril end retransmission); and
- 10) shall enter the "T2: in-progress basic group call" state.

9.3.3.4.8.5 Retransmitting GROUP CALL IMMEDIATE PERIL END

When in the "T2: in-progress basic group call" state, upon expiry of timer TFG12 (immediate peril end retransmission), the MCVideo client:

- 1) shall generate a GROUP CALL IMMEDIATE PERIL END message as specified in subclause 17.1.12. In the GROUP CALL IMMEDIATE PERIL END message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier of the call associated with the basic call control state machine;
 - b) shall set the Originating MCVideo user ID IE to the stored originating MCVideo user ID of the call associated with the basic call control state machine;
 - c) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call associated with the basic call control state machine;
 - d) shall set the Last call type change time IE to the stored last call type change time of the call; and
 - e) shall set the Last user to change call type IE to the stored last user to change call type of the call;
- 2) shall send the GROUP CALL IMMEDIATE PERIL END message as specified in subclause 9.3.1.1.1;
- 3) shall increment the value of the counter CFG12 (immediate peril end retransmission) by 1;
- 4) shall start the timer TFG12 (immediate peril end retransmission) if the value of the associated counter CFG12 (immediate peril end retransmission) is less than the upper limit; and
- 5) shall remain in "T2: in-progress basic group call" state.

9.3.3.4.8.6 Terminating user downgrading immediate peril group call

When in the "T3: in-progress immediate peril group call" state, upon receiving GROUP CALL IMMEDIATE PERIL END message, the MCVideo client:

- 1) shall set the stored last call type change time to the Last call type change time IE of the received GROUP CALL IMMEDIATE PERIL END message;
- 2) shall set the stored last user to change call type to the Last user to change call type IE of the received GROUP CALL IMMEDIATE PERIL END message;
- 3) shall set the stored current call type to "BASIC GROUP CALL";
- 4) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network basic group call as described in 3GPP TS 24.483 [4];
- 5) shall stop timer TFG14 (implicit downgrade immediate peril); and
- 6) shall enter the "T2: in-progress basic group call" state.

9.3.3.4.8.7 Implicit emergency priority end

When in the "T1: in-progress emergency group call" state, upon expiry of timer TFG13 (implicit downgrade emergency), the MCVideo client:

- 1) shall store the current UTC time as the stored last call type change time of the call;
- 2) shall store the originating MCVideo user ID as the stored last user to change call type of the call;
- 3) shall set the stored current call type to "BASIC GROUP CALL";
- 4) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network basic group call as described in 3GPP TS 24.483 [4]; and
- 5) shall enter the "T2: in-progress basic group call" state.

9.3.3.4.8 Implicit imminent peril priority end

When in the "T3: in-progress imminent peril call" state, upon expiry of timer TFG14 (implicit downgrade imminent peril), the MCVideo client:

- 1) shall store the current UTC time as the stored last call type change time of the call;
- 2) shall store the originating MCVideo user ID as the stored last user to change call type of the call;
- 3) shall set the stored current call type to "BASIC GROUP CALL";
- 4) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network basic group call as described in 3GPP TS 24.483 [4]; and
- 5) shall enter the "T2: in-progress basic group call" state.

9.3.3.4.9 Merge of two calls

When in the "T1: in-progress emergency group call" state or "T2: in-progress basic group call" state or "T3: in-progress imminent peril group call" state, upon receiving a GROUP CALL ANNOUNCEMENT message with the MCVideo group ID IE matching the stored MCVideo group ID of the call and:

- 1) the Originating MCVideo user ID IE is different from the stored originating MCVideo user ID of the call; or
- 2) the Call identifier IE is different from the stored call identifier of the call;

then:

- 1) if the stored current call type is "BASIC GROUP CALL" and the value of the Call type IE of GROUP CALL ANNOUNCEMENT message is either "IMMINENT PERIL GROUP CALL" or "EMERGENCY GROUP CALL"; or
- 2) if the stored current call type is "IMMINENT PERIL GROUP CALL" and the value of the Call type IE of GROUP CALL ANNOUNCEMENT message is "EMERGENCY GROUP CALL"; or
- 3) if the stored current call type being equal to the Call type IE of the GROUP CALL ANNOUNCEMENT message and the Call start time IE of the GROUP CALL ANNOUNCEMENT message being lower than the stored call start time of the call; or
- 4) if the stored current call type being equal to the Call type IE of the GROUP CALL ANNOUNCEMENT message and the Call start time IE of the GROUP CALL ANNOUNCEMENT message being equal to the stored call start time of the call and the Call identifier IE of the GROUP CALL ANNOUNCEMENT message being lower than the stored call identifier of the call;

the MCVideo client:

- 1) shall store the value of the Last call type change time IE of the received GROUP CALL ANNOUNCEMENT message as the last call type change time of the call;
- 2) shall store the value of the Last user to change call type IE of the GROUP CALL ANNOUNCEMENT message as the last user to change call type of the call;
- 3) shall store the value of the Call type IE of the GROUP CALL ANNOUNCEMENT message as the current call type of the call;
- 4) if the Call type IE of GROUP CALL ANNOUNCEMENT message is set to "EMERGENCY GROUP CALL":
 - a) shall set the stored current ProSe per-packet priority to value corresponding to MCVideo off-network emergency group call as described in 3GPP TS 24.483 [4]; and
 - b) shall enter "T1: in-progress emergency group call" state; and
- 5) if the Call type IE of GROUP CALL ANNOUNCEMENT message is set to "IMMINENT PERIL GROUP CALL":

- a) shall set the stored current ProSe per-packet priority to value corresponding to MCVidéo off-network imminent peril group call as described in 3GPP TS 24.483 [4]; and
- b) shall enter "T3: in-progress imminent peril group call" state.

9.3.3.4.10 Call release after call establishment

When in state T1: in-progress emergency group call" or "T2: in-progress basic group call" or "T3: in-progress imminent peril group call" or upon receiving an indication from MCVidéo user to release the call, the MCVidéo client:

- 1) shall release stored current call type;
- 2) shall release stored ProSe per-packet priority;
- 3) shall release Last call type change time;
- 4) shall release Last user to change call type; and
- 5) shall enter "T0: waiting for the call to establish" state.

9.3.3.4.11 Call release or reject before call establishment

When in state "T0: waiting for the call to establish", upon receiving an indication from MCVidéo user to release or reject the call, the MCVidéo client:

- 1) shall release stored current call type;
- 2) shall release stored ProSe per-packet priority;
- 3) shall release Last call type change time;
- 4) shall release Last user to change call type;
- 5) shall remain in "T0: waiting for the call to establish" state.

9.3.3.4.12 Error handling

9.3.3.4.12.1 Unexpected MONP message received

Upon receiving a MONP message in a state where there is no handling specified for the MONP message, the MCVidéo client shall discard the MONP message.

9.3.3.4.12.2 Unexpected indication from MCVidéo user

Upon receiving an indication from the MCVidéo user in a state where there is no handling specified for the indication, the MCVidéo client shall ignore the indication.

9.3.3.4.12.3 Unexpected expiration of a timer

Upon expiration of a timer in a state where there is no handling specified for expiration of the timer, the MCVidéo client shall ignore the expiration of the timer.

9.4 Off-network Broadcast group call

9.4.1 General

9.4.2 Basic call control

9.4.2.1 General

9.4.2.2 Broadcast group call control state machine

The figure 9.4.2.2-1 gives an overview of the main states and transitions on the UE for broadcast group call call control.

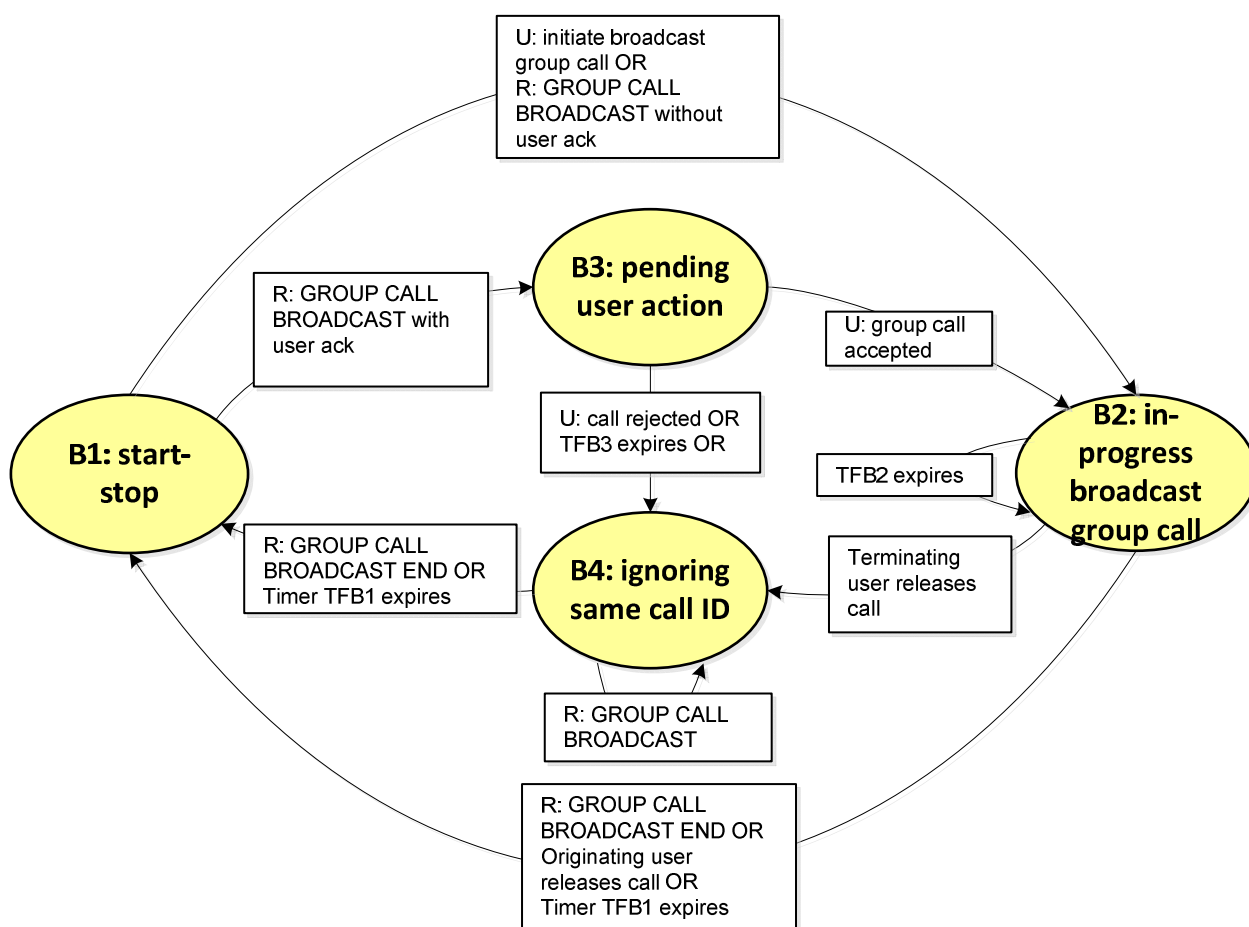


Figure 9.4.2.2-1: Broadcast group call control state machine

9.4.2.3 Broadcast group call Control states

9.4.2.3.1 B1: start-stop

This state exists for UE, when the UE is not part of an ongoing broadcast group call.

9.4.2.3.2 B2: in-progress broadcast group call

This state exists for UE, when the UE is part of an ongoing broadcast group call.

9.4.2.3.3 B3: pending user action

This state exists for the UE, when the UE has presented a notification to the MCVideo user for the received GROUP CALL BROADCAST message, is waiting for a response and is not expected to send confirm indication.

9.4.2.3.4 B4: ignoring same call ID

This state exists for UE, when the group call was rejected or released and GROUP CALL BROADCAST messages continue being received.

9.4.2.4 Procedures

9.4.2.4.1 User initiating a broadcast group call

When in the "B1: start-stop" state, upon the indication from MCVideo user to initiate the broadcast group call, the MCVideo client:

- 1) shall generate an SDP body as specified in subclause 9.3.1.1.2 and store it as the SDP body of the call;
- 2) shall generate a random number with uniform distribution between 0 and 65535 and store it as the call identifier of the call;
- 3) shall store own MCVideo user ID as the originating MCVideo user ID of the call;
- 4) shall store "BROADCAST GROUP CALL" as the current call type;
- 5) shall generate a GROUP CALL BROADCAST message as specified in subclause 17.1.18. In the GROUP CALL BROADCAST message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier of the call;
 - b) shall set the Call type IE to the stored current call type;
 - c) shall set the Originating MCVideo user ID IE to the stored originating MCVideo user ID of the call;
 - d) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call; and
 - e) shall set the SDP IE to the stored SDP body of the call;
- 6) shall set the ProSe per-packet priority to the value corresponding to MCVideo off-network broadcast calls as described in 3GPP TS 24.483 [4];
- 7) shall start transmission control as originating transmission participant as described specified in subclause a.b in 3GPP TS 24.581 [5];
- 8) shall send the GROUP CALL BROADCAST message as specified in subclause 9.3.1.1.1;
- 9) shall establish a media session based on the stored SDP body of the call;
- 10) shall start timer TFB2 (broadcast retransmission); and
- 11) shall enter the "B2: in-progress broadcast group call" state.

9.4.2.4.2 Terminating UE receiving a GROUP CALL BROADCAST message when not participating in the in-progress broadcast group call

When in the "B1: start-stop" state, upon receiving a GROUP CALL BROADCAST message with the Call identifier IE not matching any in-progress broadcast group call, the MCVideo client:

- 1) shall store the value of the Call identifier IE of the GROUP CALL BROADCAST message as the call identifier of the call;
- 2) shall store the value of the Call type IE of the GROUP CALL BROADCAST message as the received current call type;

- 3) shall store the value of the SDP IE of the GROUP CALL BROADCAST message as the SDP body of the call;
- 4) shall store the value of the Originating MCVideo user ID IE of the GROUP CALL BROADCAST message as the originating MCVideo user ID of the call;
- 5) shall store the value of the MCVideo group ID IE of the GROUP CALL BROADCAST message as the MCVideo group ID of the call;
- 6) if the terminating UE is configured that the terminating MCVideo user acknowledgement is required upon a terminating call request reception:
 - i) shall start timer TFB3 (waiting for the user); and
 - ii) shall enter the "B3: pending user action" state; and
- 7) if the terminating UE is configured that the terminating MCVideo user acknowledgement is not required upon a terminating call request reception:
 - i) shall establish a media session based on the stored SDP body of the call;
 - ii) shall start transmission control as terminating transmission participant as specified in subclause a.b in 3GPP TS 24.581 [5];
 - iii) shall start timer TFB1 (max duration); and
 - iv) shall enter the "B2: in-progress broadcast group call" state.

9.4.2.4.3 MCVideo user accepts the terminating call

When in the "B3: pending user action" state, upon indication from the MCVideo user to accept the incoming broadcast group call, the MCVideo client:

- 1) shall establish a media session based on the stored SDP body of the call;
- 2) shall start transmission control as terminating transmission participant as described specified in subclause a.b in 3GPP TS 24.581 [5];
- 3) shall stop timer TFB3 (waiting for the user);
- 4) shall start timer TFB1 (max duration); and
- 5) shall enter the "B2: in-progress broadcast group call" state.

9.4.2.4.4 MCVideo user rejects the terminating call

When in the "B3: pending user action" state, upon an indication from the MCVideo user to reject the incoming broadcast group call, the MCVideo client:

- 1) shall stop timer TFB3 (waiting for the user); and
- 2) shall enter the "B4: ignoring same call ID" state.

9.4.2.4.5 MCVideo user does not act on terminating call

When in the "B3: pending user action" state, upon expiration of timer TFB3 (waiting for the user), the MCVideo client:

- 1) shall enter the "B4: ignoring same call ID" state.

9.4.2.4.6 Terminating user releasing the call

When in the "B2: in-progress broadcast group call" state, upon an indication from the terminating MCVideo user to release the in-progress broadcast group call, the MCVideo client:

- 1) shall release the media session;

- 2) shall stop transmission control; and
- 3) shall enter the "B4: ignoring same call ID" state.

9.4.2.4.7 Originating user releasing the call

When in the "B2: in-progress broadcast group call" state, upon an indication from the originating MCVideo user to release the in-progress broadcast group call, the MCVideo client:

- 1) shall release the media session;
- 2) shall generate a GROUP CALL BROADCAST END message as specified in subclause 17.1.19. In the GROUP CALL BROADCAST END message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier of the call;
 - b) shall set the Originating MCVideo user ID IE to the stored originating MCVideo user ID of the call; and
 - c) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call;
- 3) shall send the GROUP CALL BROADCAST END message as specified in subclause 9.3.1.1.1;
- 4) shall stop timer TFB2 (broadcast retransmission);
- 5) shall stop transmission control; and
- 6) shall enter the "B1: start-stop" state.

9.4.2.4.8 Receiving GROUP CALL BROADCAST END message

When in the "B2: in-progress broadcast group call" state or "B4: ignoring same call ID" state, upon receiving GROUP CALL BROADCAST END message with the same Call identifier IE as the stored call identifier, the MCVideo client:

- 1) shall release media session;
- 2) shall stop transmission control, if running; and
- 3) shall enter the "B1: start-stop" state.

9.4.2.4.9 Originating UE retransmitting GROUP CALL BROADCAST message

When in the "B2: in-progress broadcast group call" state, upon expiry of timer TFB2 (broadcast retransmission), the MCVideo client:

- 1) shall generate a GROUP CALL BROADCAST message as specified in subclause 17.1.18. In the GROUP CALL BROADCAST message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier of the call;
 - b) shall set the Call type IE to the stored current call type;
 - c) shall set the Originating MCVideo user ID IE to the stored originating MCVideo user ID of the call;
 - d) shall set the MCVideo group ID IE to the stored MCVideo group ID of the call; and
 - e) shall set the SDP IE to the stored SDP body of the call;
- 2) shall send the GROUP CALL BROADCAST message as specified in subclause 9.3.1.1.1;
- 3) shall restart timer TFB2 (broadcast retransmission); and
- 4) shall remain in the "B2: in-progress broadcast group call" state.

9.4.2.4.10 Ignoring same call ID

When in the "B4: ignoring same call ID" state, upon receiving GROUP CALL BROADCAST message and if the call identifier in GROUP CALL BROADCAST message matches with the stored call identifier the MCVideo client:

- 1) shall restart timer TFB1 (max duration); and
- 2) shall remain in "B4: ignoring same call ID" state.

9.4.2.4.11 Releasing the call

When in the "B2: in-progress broadcast group call" state or "B4: ignoring same call ID" state, upon expiry of timer TFB1 (max duration) the MCVideo client:

- 1) shall release the media session;
- 2) shall clear the stored call identifier;
- 3) shall stop transmission control, if running; and
- 4) shall enter the "B1: start-stop" state.

10 Private call

10.1 General

10.2 Private call in on-network

10.2.1 General

10.2.2 MCVideo client procedures

10.2.3 MCVideo server procedures

10.3 Off-network private call

10.3.1 General

10.3.1.1 Common procedures

10.3.1.1.1 Sending/Receiving a message

In order to participate in a private call, the MCVideo client:

- 1) shall send the MONP message as a UDP message to the local IP address of the MCVideo user, on UDP port TBD, with an IP time-to-live set to 255; and

Editor's note: Port number for the message is FFS.

- 2) shall treat UDP messages received on the port TBD as received MONP messages.

NOTE: An MCVideo client that supports IPv6 shall listen to the IPv6 addresses.

10.3.1.1.2 Session description

For an off-network MCVideo session, only MCVideo video is used.

One off-network MCVideo session includes one media-transmission control entity.

The MCVideo client shall generate an SDP body for a group call in accordance with rules and procedures of IETF RFC 4566 [2] and IETF RFC 3264 [7].

The MCVideo client:

- 1) shall include in the session-level section:
 - a) the "o=" field with the <username> portion set to a dash;
 - b) the "s=" field with the <session name> portion set to a dash; and
 - c) the "c=" field with the <nettype> portion set to "IN", the <addrtype> portion set to the IP version of the unicast IP address of the MCVideo client and the <connection-address> portion set to the unicast IP address of the MCVideo client;
- 2) shall include the media-level section for MCVideo video consisting of:
 - a) the "m=" field with the <media> portion set to "video", the <port> portion set to a port number for MCVideo video of the MCVideo group, the <proto> field set to "RTP/AVP" and <fmt> portion set indicating RTP payload type numbers;
 - b) the "i=" field with the <session description> portion set to "video";
 - c) the "a=fmtp:" attribute(s), the "a=rtpmap:" attribute(s) or both, indicating the codec(s) and media parameters of the MCVideo video; and
 - d) the "a=rtcp:" attribute indicating port number to be used for RTCP at the MCVideo client selected according to the rules and procedures of IETF RFC 3605 [3], if the media steam uses other than the default IP address;
- 3) shall include the media-level section for media-transmission control entity consisting of:
 - a) an "m=" line, with the <media> portion set to "application", the <port> portion set to a port number for media-transmission control entity of the MCVideo group, the <proto> field set to "udp" and <fmt> portion set to "MCVideo"; and
 - b) the "a=fmtp:MCVideo" attribute indicating the parameters of the media-transmission control entity as specified 3GPP TS 24.581 [5]; and
- 4) shall include the MIKEY-SAKKE I_MESSAGE, if generated by the MCVideo client, in an "a=key-mgmt" attribute as a "mikey" attribute value in the SDP offer as specified in IETF RFC 4567 [6].

10.3.2 Basic call control

10.3.2.1 General

Editor's Note: Check on maximum number of simultaneous calls is FFS.

10.3.2.2 Private call control state machine

The figure 10.3.2.2-1 gives an overview of the main states and transitions on the UE for private call control.

Each private call control state machine is per MCVideo user ID.

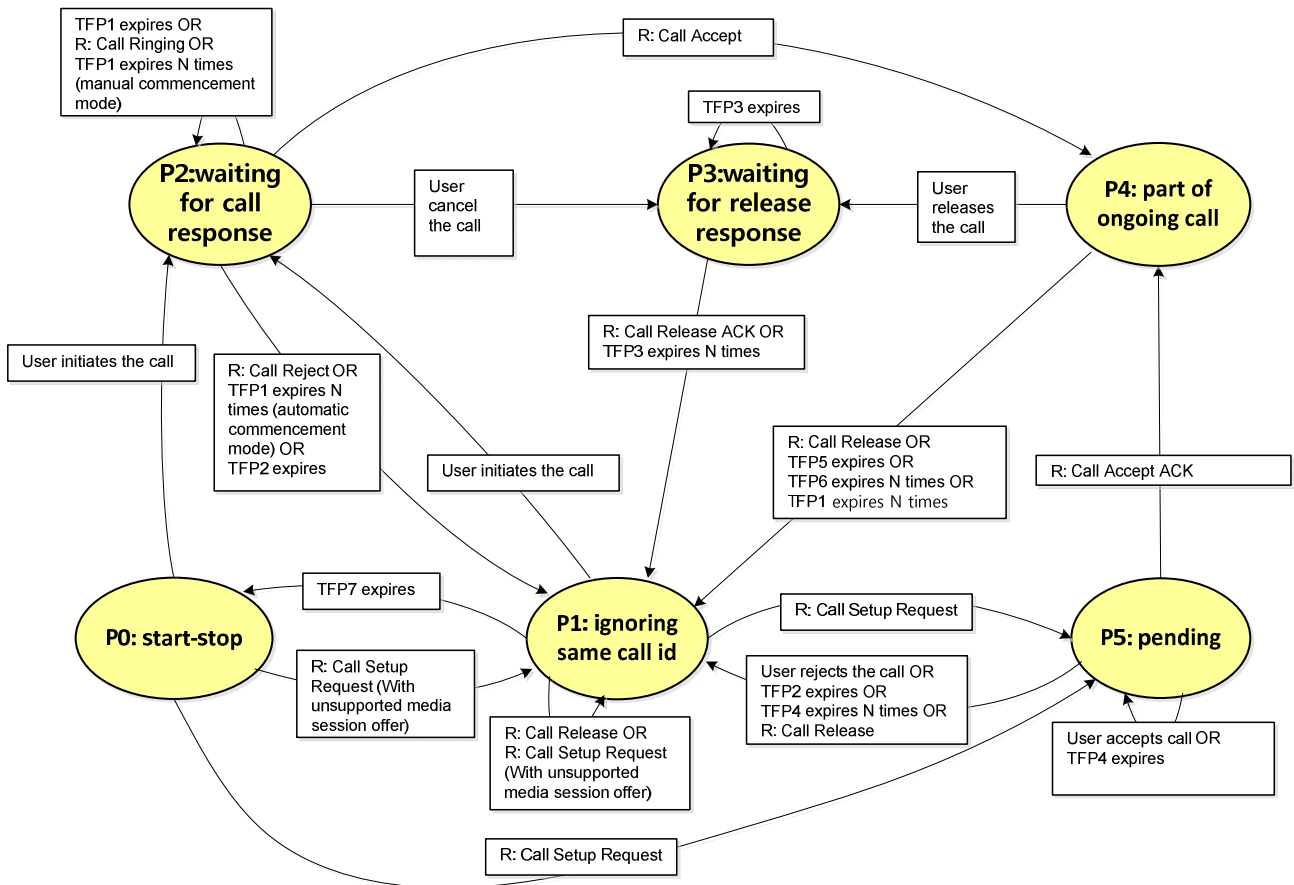


Figure 10.3.2.2-1: Private call control state machine

10.3.2.3 Private call control states

10.3.2.3.1 P0: start-stop

In this state, no private call control entity exists.

10.3.2.3.2 P1: ignoring same call id

This state exists for UE, when the UE is not part of an ongoing private call.

10.3.2.3.3 P2: waiting for call response

This state exists for UE, when the UE has sent a PRIVATE CALL SETUP REQUEST message and is waiting for a response, PRIVATE CALL ACCEPT or PRIVATE CALL REJECT message.

10.3.2.3.4 P3: waiting for release response

This state exists for UE, when the UE has sent a PRIVATE CALL RELEASE message and is waiting for a PRIVATE CALL RELEASE ACK message.

10.3.2.3.5 P4: part of ongoing call

This state exists for UE, when the UE is part of an ongoing private call.

10.3.2.3.6 P5: pending

This state exists for UE, when the UE has presented a notification to the user for the received PRIVATE CALL SETUP REQUEST message and is waiting for a user indication.

10.3.2.4 Procedures

10.3.2.4.1 General

10.3.2.4.2 Private call setup

10.3.2.4.2.1 Initiating a private call

When in the "P0: start-stop" state or "P1: ignoring same call id", upon an indication from MCVideo User to initiate a private call, the MCVideo client:

Editor's Note: Authorization check for private call is FFS.

- 1) shall generate and store the call identifier as a random number uniformly distributed between (0, 65536);
- 2) shall store own MCVideo user ID as caller ID;
- 3) shall store MCVideo user ID of the callee as callee ID;
- 4) shall store "AUTOMATIC COMMENCEMENT MODE" as commencement mode, if requested. Otherwise if the value of, store "MANUAL COMMENCEMENT MODE" as commencement mode;

Editor's Note: Authorization check for commencement modes is FFS.

- 5) shall store "PRIVATE CALL" as the current call type;;
- 6) if an end-to-end security context needs to be established then:
 - a) shall use keying material provided by the key management server to generate a PCK as described in 3GPP TS 33.180 [8];
 - b) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0011" 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 [8];
 - c) shall encrypt the PCK to a UID associated to the MCVideo client using the MCVideo ID of the invited user and a time related parameter as described in 3GPP TS 33.180 [8];
 - d) shall generate a MIKEY-SAKKE I_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [8];
 - e) shall add the MCVideo ID of the originating MCVideo to the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [8];
 - f) shall sign the MIKEY-SAKKE I_MESSAGE using the originating MCVideo 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 [8] and;
 - g) shall store the MIKEY-SAKKE I_MESSAGE for later inclusion in an SDP body;
- 7) may store current user location as user location;
- 8) shall set the stored current ProSe per-packet priority to value corresponding to MCPTT off-network private call as described in 3GPP TS 24.483 [4].
- 9) shall generate and store offer SDP, as defined in subclause 10.3.1.1.2;
- 10) shall generate a PRIVATE CALL SETUP REQUEST message as specified in subclause 17.1.5. In the PRIVATE CALL SETUP REQUEST message, the MCVideo client:

- a) shall set the Call identifier IE with the stored call identifier;
 - b) shall set the MCVideo user ID of the caller IE with the stored caller ID;
 - c) shall set the MCVideo user ID of the callee IE with the stored callee ID;
 - d) shall set the Commencement mode IE with the stored commencement mode;
 - e) shall set the Call type IE with the stored current call type;
 - f) shall set the SDP offer IE with the stored offer SDP; and
 - g) may set the User location IE with the stored user location.
- 11) shall send the PRIVATE CALL SETUP REQUEST message towards other MCVideo client according to rules and procedures as specified in subclause 10.3.1.1.1;
- 12) shall initialize the counter CFP1 (private call request retransmission) with the value set to 1;
- 13) shall start timer TFP1 (private call request retransmission); and
- 14) shall enter the "P2: waiting for call response" state.

10.3.2.4.2.2 Private call setup request retransmission

When in the "P2: waiting for call response" state, upon expiry of timer TFP1 (private call request retransmission), the MCVideo client:

- 1) may update the stored user location with current user location;
- 2) shall increment the value of counter CFP1 (private call request retransmission) by 1;
- 3) shall generate a PRIVATE CALL SETUP REQUEST message as specified in subclause 17.1.5. In the PRIVATE CALL SETUP REQUEST message, the MCVideo client:
 - a) shall set the Call identifier IE with the stored call identifier;
 - b) shall set the MCVideo user ID of the caller IE with the stored caller ID;
 - c) shall set the MCVideo user ID of the callee IE with the stored callee ID;
 - d) shall set the Commencement mode IE with the stored commencement mode;
 - e) shall set the Call type IE with the stored current call type;
 - f) shall set the SDP offer IE with the stored offer SDP; and
 - g) may set the User location IE with stored user location.
- 4) shall send the PRIVATE CALL SETUP REQUEST message towards other MCVideo client according to rules and procedures as specified in subclause 10.3.1.1.1;
- 5) shall start timer TFP1 (private call request retransmission); and
- 6) shall remain in the "P2: waiting for call response" state.

10.3.2.4.2.3 Ringing notification to the user

When in the "P2: waiting for call response" state, upon receiving a PRIVATE CALL RINGING message, the MCVideo client:

- 1) shall remain in the "P2: waiting for call response" state.

10.3.2.4.2.4 No response to private call setup request with automatic commencement mode

In the "P2: waiting for call response" state, when timer TFP1 (private call request retransmission) expires and the value of the counter CFP1 (private call request retransmission) is equal to the upper limit and the stored commencement mode is "AUTOMATIC COMMENCEMENT MODE", the MCVideo client:

- 1) shall start timer TFP7 (waiting for any message with same call identifier); and
- 2) shall enter the "P1: ignoring same call id" state.

10.3.2.4.2.5 No response to private call setup request with manual commencement mode

When in the "P2: waiting for call response" state when timer TFP1 (private call request retransmission) expires and the value of the counter CFP1 (private call request retransmission) is equal to the upper limit and the stored commencement mode is "MANUAL COMMENCEMENT MODE", the MCVideo client:

- 1) shall start timer TFP2 (waiting for call response message); and
- 2) shall remain in the "P2: waiting for call response" state.

10.3.2.4.2.6 No response to private call setup request after waiting for user acknowledgement

When in the "P2: waiting for call response" state, upon expiry of timer TFP2 (waiting for call response message), the MCVideo client:

- 1) shall start timer TFP7 (waiting for any message with same call identifier);
- 2) shall release the call control state machine; and
- 3) shall enter the "P1: ignoring same call id" state.

10.3.2.4.2.7 Private call setup request rejected

When in the "P2: waiting for call response" state, upon receiving a PRIVATE CALL REJECT message in response to PRIVATE CALL SETUP REQUEST message with Call identifier IE same as the stored call identifier, the MCVideo client:

- 1) shall stop timer TFP1 (call setup retransmission), if running;
- 2) shall stop timer TFP2 (waiting for call response message), if running;
- 3) shall start timer TFP7 (waiting for any message with same call identifier);
- 4) shall release the call control state machine; and
- 5) shall enter the "P1: ignoring same call id" state.

10.3.2.4.2.8 Private call setup request accepted

When in the "P2: waiting for call response" state, upon receiving a PRIVATE CALL ACCEPT message response to PRIVATE CALL SETUP REQUEST message with the same call identifier, the MCVideo client:

- 1) shall store the SDP answer IE received in the PRIVATE CALL ACCEPT message as answer SDP;
- 2) shall generate a PRIVATE CALL ACCEPT ACK message as specified in subclause 17.1.11:
 - a) shall set the Call identifier IE to the stored call identifier;
 - b) shall set the MCVideo user ID of the caller IE with the stored caller ID; and
 - c) shall set the MCVideo user ID of the callee IE with the stored callee ID.
- 3) shall send the PRIVATE CALL ACCEPT ACK message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- 4) shall stop timer TFP1 (call setup retransmission), if running;

- 5) shall stop timer TFP2 (waiting for call response message), if running;
- 6) shall establish a media session based on the SDP body of the stored answer SDP;
- 7) shall start transmission control as terminating transmission participant as specified in subclause a.b in 3GPP TS 24.581 [5];
- 8) shall start timer TFP5 (max duration); and
- 9) shall enter the "P4: part of ongoing call" state.

10.3.2.4.2.9 User cancels the private call setup request

When in the "P2: waiting for call response" state, upon an indication from MCVideo User to cancel the private call request, the MCVideo client:

- 1) shall generate a PRIVATE CALL RELEASE message as specified in subclause 17.1.9;
 - a) shall set the Call identifier IE to the stored call identifier;
 - b) shall set the MCVideo user ID of the caller IE with the stored caller ID; and
 - c) shall set the MCVideo user ID of the callee IE with the stored callee ID;
- 2) shall send the PRIVATE CALL RELEASE message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- 3) shall start timer TFP3 (private call release retransmission); and
- 4) shall enter the "P3: waiting for release response" state.

10.3.2.4.3 Private call setup in automatic commencement mode

10.3.2.4.3.1 Unable to establish media

When in the "P0: start-stop" or "P1: ignoring same call id" state, upon receiving a PRIVATE CALL SETUP REQUEST message with Call identifier IE different than stored call identifier and media session declared in SDP body of PRIVATE CALL SETUP REQUEST message cannot be established, the MCVideo client:

- 1) shall store the Call identifier IE in the received message as call identifier;
- 2) shall store the MCVideo user ID of the caller IE in the received PRIVATE CALL SETUP message as caller ID;
- 3) shall store own MCVideo user ID as callee ID;
- 4) shall generate a PRIVATE CALL REJECT message as specified in subclause 17.1.8. In the PRIVATE CALL REJECT message, the MCVideo client:
 - a) shall set the Call identifier IE to the cached call identifier;
 - b) shall set the MCVideo user ID of the caller IE with the stored caller ID;
 - c) shall set the MCVideo user ID of the callee IE with stored callee ID; and
 - d) shall set the Reason IE as "FAILED", if requested to restrict notification of call failure. Otherwise, shall set the Reason IE as "MEDIA FAILURE".

Editor's Note: Authorization check for notification restriction is FFS.

- 5) shall send the PRIVATE CALL REJECT message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- 6) shall start timer TFP7 (waiting for any message with same call identifier); and
- 7) shall enter the "P1: ignoring same call id" state if current state is the "P0: start-stop" state.

10.3.2.4.3.2 Responding to private call setup request when not participating in the ongoing call

When in the "P0: start-stop" or "P1: ignoring same call id" state, upon receiving a PRIVATE CALL SETUP REQUEST message with Commencement mode IE set to "AUTOMATIC COMMENCEMENT MODE" and Call identifier IE different than stored call identifier and media session declared in SDP body of PRIVATE CALL SETUP REQUEST message can be established, the MCVideo client:

- 1) shall store the Call identifier IE in the received message as call identifier;
 - 2) shall set the stored current call type to "PRIVATE CALL";
 - 3) shall set the stored current ProSe per-packet priority to value corresponding to MCPTT off-network private call as described in 3GPP TS 24.483 [4].
 - 4) shall store the MCVideo user ID of the caller IE in the received PRIVATE CALL SETUP REQUEST message as caller ID;
 - 5) shall store own MCVideo user ID as callee ID;
 - 6) if the SDP offer contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I_MESSAGE:
 - a) shall extract the MCVideo ID of the originating MCVideo user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [8];
 - b) shall convert the MCVideo ID to a UID as described in 3GPP TS 33.180 [8];
 - c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [8];
 - d) if the validation of the signature failed, shall generate a PRIVATE CALL REJECT message as specified in subclause 17.1.8. In the PRIVATE CALL REJECT message, the MCVideo client:
 - i) shall set the call identifier IE to the stored call identifier;
 - ii) shall set the MCVideo user ID of the caller IE with the stored caller ID;
 - iii) shall set the MCVideo user ID of the callee IE with the stored callee ID;
 - iv) shall set the Reason IE as "FAILED", if requested to restrict notification of call failure. Otherwise, shall set the reason IE as "E2E SECURITY CONTEXT FAILURE";
- Editor's Note: Authorization check for notification restriction is FFS.**
- v) shall send the PRIVATE CALL REJECT message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1; and
 - vi) shall remain in the current state;
- e) if the validation of the signature was successful:
 - i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [8];
 - ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [8];
 - iii) shall generate and store answer SDP based on received SDP offer IE in PRIVATE CALL SETUP REQUEST message, as defined in subclause 10.3.1.1.2;
 - iv) shall generate a PRIVATE CALL ACCEPT message as specified in subclause 17.1.7. In the PRIVATE CALL ACCEPT message, the MCVideo client:
 - A) shall set the Call identifier IE to the stored call identifier; and
 - B) shall set the MCVideo user ID of the caller IE with stored caller ID.
 - C) shall set the MCVideo user ID of the callee IE with stored callee ID; and

- D) shall set the SDP answer IE with the stored answer SDP;
- v) shall send PRIVATE CALL ACCEPT message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- vi) shall establish a media session based on the SDP body of the stored answer SDP;
- vii) shall initialize the counter CFP4 with value set to 1;
- viii) shall start timer TFP4 (private call accept retransmission); and
- ix) shall enter the "P5: pending" state; and

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

- 7) if the SDP offer does not contain an "a=key-mgmt" attribute, the MCVideo client:
 - a) shall generate and store answer SDP based on received SDP offer IE in PRIVATE CALL SETUP REQUEST message, as defined in subclause 10.3.1.1.2;
 - b) shall generate a PRIVATE CALL ACCEPT message as specified in subclause 17.1.7:
 - i) shall set the Call identifier IE to the stored call identifier;
 - ii) shall set the MCVideo user ID of the caller IE with stored caller ID.
 - iii) shall set the MCVideo user ID of the callee IE with stored callee ID; and
 - iv) shall set the SDP answer IE with the stored answer SDP;
 - c) shall send PRIVATE CALL ACCEPT message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
 - d) shall establish a media session based on the SDP body of the stored answer SDP;
 - e) shall initialize the counter CFP4 with value set to 1;
 - f) shall start timer TFP4 (private call accept retransmission); and
 - g) shall enter the "P5: pending" state.

10.3.2.4.3.3 Private call accept retransmission

When in the "P5: pending" state, upon expiry of timer TFP4 (private call accept retransmission), the MCVideo client:

- 1) shall generate a PRIVATE CALL ACCEPT message as specified in subclause 17.1.7. In the PRIVATE CALL ACCEPT message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier;
 - b) shall set the MCVideo user ID of the caller IE with the stored caller ID;
 - c) shall set the MCVideo user ID of the callee IE with the stored callee ID; and
 - d) shall set the SDP answer IE with the stored answer SDP;
- 2) shall send PRIVATE CALL ACCEPT message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- 3) shall increment the value of the counter CFP4 (private call accept retransmission) by 1;
- 4) shall start timer TFP4 (private call accept retransmission); and
- 5) shall remain in the "P5: pending" state.

10.3.2.4.3.4 Establishing the call

When in the "P5: pending" state, upon receiving a PRIVATE CALL ACCEPT ACK message or RTP media from originating user, the MCVideo client:

- 1) shall stop timer TFP4 (private call accept retransmission);
- 2) shall start transmission control as terminating MCVideo client as specified in subclause a.b in 3GPP TS 24.581 [5];
- 3) shall start timer TFP5 (max duration); and
- 4) shall enter the "P4: part of ongoing call" state.

10.3.2.4.3.5 Call failure

In the "P5: pending" state, when timer TFP4 (private call accept retransmission) expires and the value of the counter CFP4 (private call accept retransmission) is equal to the upper limit, the MCVideo client:

- 1) shall start timer TFP7 (waiting for any message with same call identifier); and
- 2) shall enter the "P1: ignoring same call id" state.

10.3.2.4.4 Private call setup in manual commencement mode

10.3.2.4.4.1 Incoming private call

When in the "P0: start-stop" or "P1: ignoring same call id" state, upon receiving a PRIVATE CALL SETUP REQUEST message with Commencement mode IE set to "MANUAL COMMENCEMENT MODE" and Call identifier IE different from stored call identifier, the MCVideo client:

- 1) shall store the Call identifier IE in the received message as call identifier;
- 2) shall set the stored current call type to "PRIVATE CALL";
- 3) shall set the stored current ProSe per-packet priority to value corresponding to MCPTT off-network private call as described in 3GPP TS 24.483 [4].
- 4) shall store the MCVideo user ID of the caller IE as received in the PRIVATE CALL SETUP REQUEST as caller ID;
- 5) shall store own MCVideo user ID as callee ID;
- 6) shall generate a PRIVATE CALL RINGING message as specified in subclause 17.1.6;
 - a) shall set the Call identifier IE to the stored call identifier;
 - b) shall set the MCVideo user ID of the caller IE with the stored caller ID; and
 - c) shall set the MCVideo user ID of the callee IE with the stored callee ID;
- 7) shall send PRIVATE CALL RINGING message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- 8) shall start timer TFP2 (waiting for call response message); and
- 9) shall enter the "P5: pending" state.

10.3.2.4.4.2 No response from the user

When in the "P5: pending" state, upon expiry of timer TFP2 (waiting for call response message), the MCVideo client:

- 1) shall generate a PRIVATE CALL REJECT message as specified in subclause 17.1.8:

- a) shall set the Call identifier IE to the stored call identifier;
 - b) shall set the MCVidéo user ID of the caller IE with the stored caller ID;
 - c) shall set the MCVidéo user ID of the callee IE with the stored callee ID; and
 - d) shall set the Reason IE as "FAILED".
- 2) shall send the PRIVATE CALL REJECT message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- 3) shall start timer TFP7 (waiting for any message with same call identifier); and
- 4) shall enter the "P1: ignoring same call id" state.

10.3.2.4.4.3 User accepts the private call setup request

When in the "P5: pending" state, upon an indication from MCVidéo User to accept the incoming private call, the MCVidéo client:

- 1) if the SDP offer contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I_MESSAGE:
 - a) shall extract the MCVidéo ID of the originating MCVidéo user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [8];
 - b) shall convert the MCVidéo ID to a UID as described in 3GPP TS 33.180 [8];
 - c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [8];
 - d) if the validation of the signature failed, shall generate a PRIVATE CALL REJECT message as specified in subclause 17.1.8. In the PRIVATE CALL REJECT message, the MCVidéo client:
 - i) shall set the call identifier IE to the stored call identifier;
 - ii) shall set the MCVidéo user ID of the caller IE with the stored caller ID;
 - iii) shall set the MCVidéo user ID of the callee IE with the stored callee ID;
 - iv) shall set the Reason IE as "FAILED", if requested to restrict notification of call failure. Otherwise, shall set the reason IE as "E2E SECURITY CONTEXT FAILURE";
- Editor's Note: Authorization check for notification restriction is FFS.**
- v) shall send the PRIVATE CALL REJECT message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1; and
 - vi) shall enter the "P1: ignoring same call id" state;
- e) if the validation of the signature was successful:
- i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [8];
 - ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [8];
 - iii) shall generate and store answer SDP based on received SDP offer IE in PRIVATE CALL SETUP REQUEST message, as defined in subclause 10.3.1.1.2;
 - iv) shall generate a PRIVATE CALL ACCEPT message as specified in subclause 17.1.7. In the PRIVATE CALL ACCEPT message, the MCVidéo client:
 - A) shall set the Call identifier IE to the stored call identifier;
 - B) shall set the MCVidéo user ID of the caller IE with the stored caller ID;

- C) shall set the MCVideo user ID of the callee IE with the stored callee ID; and
- D) shall set the SDP answer IE with the stored answer SDP;
- v) shall send the PRIVATE CALL ACCEPT message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- vi) shall establish a media session based on the SDP body of the private call;
- vii) shall stop timer TFP2 (waiting for call response message);
- viii) shall initialize the counter CFP4 with value set to 1;
- ix) shall start timer TFP4 (private call accept retransmission); and
- x) shall remain in the "P5: pending" state; and

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

- 2) if the SDP offer does not contain an "a=key-mgmt" attribute, the MCVideo client:
 - a) shall generate and store answer SDP based on received SDP offer IE in PRIVATE CALL SETUP REQUEST message, as defined in subclause 10.3.1.1.2;
 - b) shall generate a PRIVATE CALL ACCEPT message as specified in subclause 17.1.7. In the PRIVATE CALL ACCEPT message, the MCVideo client:
 - i) shall set the Call identifier IE to the stored call identifier;
 - ii) shall set the MCVideo user ID of the caller IE with the stored caller ID;
 - iii) shall set the MCVideo user ID of the callee IE with the stored callee ID; and
 - iv) shall set the SDP answer IE with the stored answer SDP;
 - c) shall send the PRIVATE CALL ACCEPT message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
 - d) shall establish a media session based on the SDP body of the private call;
 - e) shall stop timer TFP2 (waiting for call response message);
 - f) shall initialize the counter CFP4 with value set to 1;
 - g) shall start timer TFP4 (private call accept retransmission); and
 - h) shall remain in the "P5: pending" state.

10.3.2.4.4.4 Private call accept retransmission

When in the "P5: pending" state, upon expiry of timer TFP4 (private call accept retransmission), the MCVideo client:

- 1) shall generate a PRIVATE CALL ACCEPT message as specified in subclause 17.1.7. In the PRIVATE CALL ACCEPT message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier;
 - b) shall set the MCVideo user ID of the caller IE the stored caller ID;
 - c) shall set the MCVideo user ID of the callee IE with the stored callee ID; and
 - d) shall set the SDP answer IE with the stored answer SDP;
- 2) shall send PRIVATE CALL ACCEPT message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- 3) shall increment the value of the (counter CFP4 private call accept retransmission) by 1;

- 4) shall start timer TFP4 (private call accept retransmission); and
- 5) shall remain in the "P5: pending" state.

10.3.2.4.4.5 Establishing the call

When in the "P5: pending" state, upon receiving a PRIVATE CALL ACCEPT ACK message or RTP media from originating user, the MCVideo client:

- 1) shall stop timer TFP4 (private call accept retransmission);
- 2) shall start transmission control as terminating MCVideo client as specified in subclause a.b in 3GPP TS 24.581 [5];
- 3) shall start timer TFP5 (max duration); and
- 4) shall enter the "P4: part of ongoing call" state.

10.3.2.4.4.6 Call failure

In the "P5: pending" state, when timer TFP4 (private call accept retransmission) expires and the value of the counter CFP4 (private call accept retransmission) is equal to the upper limit, the MCVideo client:

- 1) shall start timer TFP7 (waiting for any message with same call identifier); and
- 2) shall enter the "P1: ignoring same call id" state.

10.3.2.4.4.7 User rejects the private call setup request

When in the "P5: pending" state, upon an indication from MCVideo User to reject the incoming private call, the MCVideo client:

- 1) shall generate a PRIVATE CALL REJECT message as specified in subclause 17.1.8:
 - a) shall set the Call identifier IE to the stored call identifier;
 - b) shall set the MCVideo user ID of the caller IE with the stored caller ID;
 - c) shall set the MCVideo user ID of the callee IE with stored callee ID; and
 - d) shall set the Reason IE as "FAILED", if requested to restrict notification of call failure. Otherwise, shall set the Reason IE as "REJECT";

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- 2) shall send the PRIVATE CALL REJECT message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- 3) shall start timer TFP7 (waiting for any message with same call identifier); and
- 4) shall enter the "P1: ignoring same call id" state.

10.3.2.4.4.8 Caller cancels the private call setup request before call establishment

When in the "P5: pending" state or "P1: ignoring same call id" state, upon receiving a PRIVATE CALL RELEASE message, the MCVideo client:

- 1) shall generate a PRIVATE CALL RELEASE ACK message as specified in subclause 17.1.10. In the PRIVATE CALL RELEASE ACK message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier;
 - b) shall set the MCVideo user ID of the caller IE with the stored caller ID; and
 - c) shall set the MCVideo user ID of the callee IE with the stored callee ID.

- 2) shall send the PRIVATE CALL RELEASE ACK message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- 3) shall start timer TFP7 (waiting for any message with same call identifier);
- 4) shall stop timer TFP4 (private call accept retransmission) if running; and
- 5) shall enter the "P1: ignoring same call id" state, if the current state is "P5: pending" state.

10.3.2.4.5 Private call release

10.3.2.4.5.1 Releasing a private call

When in the "P4: part of ongoing call" state, upon an indication from MCVideo User to release a private call, the MCVideo client:

- 1) shall generate a PRIVATE CALL RELEASE message as specified in subclause 17.1.9. In the PRIVATE CALL RELEASE message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier;
 - b) shall set the MCVideo user ID of the caller IE with stored caller ID; and
 - c) shall set the MCVideo user ID of the callee IE with stored callee ID.
- 2) shall send the PRIVATE CALL RELEASE message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- 3) shall initialize the counter CFP3 (private call release retransmission) with the value set to 1;
- 4) shall start timer TFP3 (private call release retransmission); and
- 5) shall enter the "P3: waiting for release response" state.

10.3.2.4.5.2 Private call release retransmission

When in the "P3: waiting for release response" state, upon expiry of timer TFP3 (private call release retransmission), the MCVideo client:

- 1) shall generate a PRIVATE CALL RELEASE message as specified in subclause 17.1.9. In the PRIVATE CALL RELEASE message, the MCVideo client:
 - a) shall set the Call identifier IE to the stored call identifier;
 - b) shall set the MCVideo user ID of the caller IE with stored caller ID; and
 - c) shall set the MCVideo user ID of the callee IE with the stored callee ID.
- 2) shall send the PRIVATE CALL RELEASE message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- 3) shall increment the value of timer CFP3 by 1;
- 4) shall start timer TFP3 (private call release retransmission); and
- 5) shall remain in the "P3: waiting for release response" state.

10.3.2.4.5.3 No response to private call release

In the "P3: waiting for release response" state, when timer TFP3 (private call request retransmission) expires and the value of the counter CFP3 (private call release retransmission) is equal to the upper limit, the MCVideo client:

- 1) shall terminate the media session;
- 2) shall start timer TFP7 (waiting for any message with same call identifier); and

- 3) shall enter the "P1: ignoring same call id" state.

10.3.2.4.5.4 Acknowledging private call release after call establishment

When in the "P4: part of ongoing call" state, upon receiving a PRIVATE CALL RELEASE message, the MCVideo client:

- 1) shall generate a PRIVATE CALL RELEASE ACK message as specified in subclause 17.1.10;
 - a) shall set the Call identifier IE to the stored call identifier;
 - b) shall set the MCVideo user ID of the caller IE the stored caller ID; and
 - c) shall set the MCVideo user ID of the callee IE with the stored callee ID.
- 2) shall send the PRIVATE CALL RELEASE ACK message in response to the request message according to rules and procedures as specified in subclause 10.3.1.1.1;
- 3) shall terminate the media session for private call;
- 4) shall start timer TFP7 (waiting for any message with same call identifier); and
- 5) shall enter the "P1: ignoring same call id" state.

10.3.2.4.5.5 Private call release acknowledged

When in the "P3: waiting for release response" state, upon receiving a PRIVATE CALL RELEASE ACK to PRIVATE CALL RELEASE message, the MCVideo client:

- 1) shall stop timer TFP3 (private call release retransmission), if running;
- 2) shall terminate the media session;
- 3) shall start timer TFP7 (waiting for any message with same call identifier); and
- 4) shall enter the "P1: ignoring same call id" state.

10.3.2.4.5.6 Max duration reached

When in the "P4: part of ongoing call" state, upon expiry of timer TFP5 (max duration), the MCVideo client:

- 1) shall terminate the media session;
- 2) shall start timer TFP7 (waiting for any message with same call identifier); and
- 3) shall enter the "P1: ignoring same call id" state.

10.3.2.4.5.7 Stop ignoring same call id

When in the "P1: ignoring same call id" state, upon expiry of timer TFP7 (waiting for any message with same call identifier) the MCVideo client:

- 1) shall clear the stored call identifier; and
- 2) shall enter the "P0: start-stop" state.

10.3.2.4.5.8 No response to emergency private call setup request

In the "P4: part of ongoing call" state, when timer TFP1 (private call request retransmission) expires and the value of the counter CFP1 (private call request retransmission) is equal to the upper limit, the MCVideo client:

- 1) shall start timer TFP7 (waiting for any message with same call identifier); and
- 2) shall enter the "P1: ignoring same call id" state.

10.3.2.4.5.9 No response to emergency private call cancel

In the "P4: part of ongoing call" state, when timer TFP6 (emergency private call cancel retransmission) expires and the value of the counter CFP6 (emergency private call cancel retransmission) is equal to the upper limit, the MCVideo client:

- 1) shall start timer TFP7 (waiting for any message with same call identifier); and
- 2) shall enter the "P1: ignoring same call id" state.

10.3.2.4.6 Error handling

10.3.2.4.6.1 Unexpected MONP message received

Upon receiving a MONP message in a state where there is no handling specified for the MONP message, the MCVideo client shall discard the MONP message.

10.3.2.4.6.2 Unexpected indication from MCVideo user

Upon receiving an indication from the MCVideo user in a state where there is no handling specified for the indication, the MCVideo client shall ignore the indication.

10.3.2.4.6.3 Unexpected expiration of a timer

Upon expiration of a timer in a state where there is no handling specified for expiration of the timer, the MCVideo client shall ignore the expiration of the timer.

11 Emergency Alert

11.1 General

11.2 On-network emergency alert

11.3 Off-network emergency alert

11.3.1 General

11.3.2 Basic state machine

11.3.2.1 General

11.3.2.2 Emergency alert state machine

The figure 11.3.2.2-1 gives an overview of the main states and transitions on the UE for emergency alert.

Each emergency alert state machine is per MCVideo group.

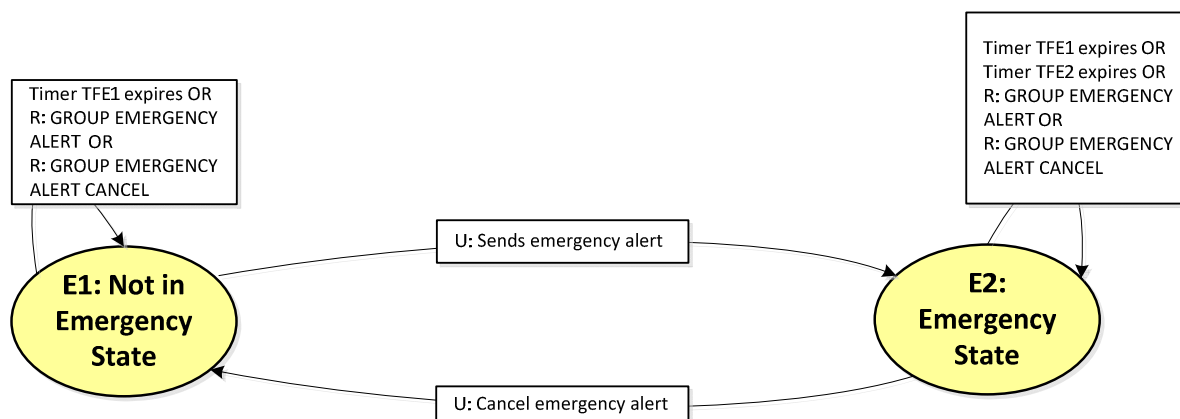


Figure 11.3.2.2-1: Emergency alert state machine

The following piece of information is associated with the emergency alert state machine:

- a) the stored emergency state of the MCVideo group.

NOTE: The emergency alert state machine is referred by the MCVideo off-network group call and MCVideo off-network private call procedures.

11.3.2.3 Emergency alert states

11.3.2.3.1 E1: Not in emergency state

This state is the start state of this state machine.

The UE stays in this state while not in emergency state.

11.3.2.3.2 E2: Emergency state

This state exists for UE, when the UE has sent a GROUP EMERGENCY ALERT message.

11.3.3 Procedures

11.3.3.1 Originating user sending emergency alert

When in state "E1: Not in emergency state", upon receiving an indication from the MCVideo user to transmit an emergency alert for an MCVideo group ID, the MCVideo client:

Editor's Note: Authorization check to initiate emergency alert and check of applicability on the group is FFS.

- 1) shall set the stored emergency state as "true";
- 2) shall set the stored MCVideo group ID to the indicated MCVideo group ID;
- 3) shall generate a GROUP EMERGENCY ALERT message as specified in subclause 17.1.14. In the GROUP EMERGENCY ALERT message, the MCVideo client:
 - a) shall set the MCVideo group ID IE to the stored MCVideo group ID;
 - b) shall set the Originating MCVideo user ID IE to own MCVideo user ID;
 - c) shall set the Organization name IE to own organization name; and
 - d) may set the User location IE with client's current location, if requested;

- 4) shall send the GROUP EMERGENCY ALERT message as specified in subclause 9.3.1.1.1;
- 5) shall start timer TFE2 (emergency alert retransmission); and
- 6) shall enter "E2: Emergency state" state.

11.3.3.2 Emergency alert retransmission

When in state "E2: Emergency state", upon expiry of timer TFE2 (emergency alert retransmission), the MCVideo client:

- 1) shall generate a GROUP EMERGENCY ALERT message as specified in subclause 17.1.14. In the GROUP EMERGENCY ALERT message, the MCVideo client:
 - a) shall set the MCVideo group ID IE to the stored MCVideo group ID;
 - b) shall set the originating MCVideo user ID IE to own MCVideo user ID;
 - c) shall set the Organization name IE to own organization name; and
 - d) may set the Location IE with client's current location, if requested; and
- 2) shall send the GROUP EMERGENCY ALERT message as specified in subclause 9.3.1.1.1;
- 3) shall start the timer TFE2 (emergency alert retransmission); and
- 4) shall remain in the current state.

11.3.3.3 Terminating user receiving emergency alert

When in state "E1: Not in emergency state" or in "E2: Emergency state", upon receiving a GROUP EMERGENCY ALERT message with the Originating MCVideo user ID IE not stored in the list of users in emergency, the MCVideo client:

- 1) shall store the Originating MCVideo user ID IE and location IE in the list of users in emergency;
- 2) shall generate a GROUP EMERGENCY ALERT ACK message as specified in subclause 17.1.15. In the GROUP EMERGENCY ALERT ACK message, the MCVideo client:
 - a) shall set the MCVideo group ID IE to the MCVideo group ID IE of the received GROUP EMERGENCY ALERT message;
 - b) shall set the Sending MCVideo user ID IE to own MCVideo user ID; and
 - c) shall set the Originating MCVideo user ID IE to the Originating MCVideo user ID IE of the received GROUP EMERGENCY ALERT message; and
- 3) shall send the GROUP EMERGENCY ALERT ACK message as specified in subclause 9.3.1.1.1;
- 4) shall start timer TFE1 (Emergency Alert); and
- 5) shall remain in the current state.

NOTE: Each instance of timer TFE1 is per MCVideo user ID.

11.3.3.4 Terminating user receiving retransmitted emergency alert

When in state "E1: Not in emergency state" or in "E2: Emergency state", upon receiving a GROUP EMERGENCY ALERT message with the Originating MCVideo user ID IE stored in the list of users in emergency and Location IE different than the stored location of the user, the MCVideo client:

- 1) may update the stored location of the user with the received Location IE;
- 2) shall restart the associated timer TFE1 (Emergency Alert); and
- 3) shall remain in the current state.

11.3.3.5 Originating user cancels emergency alert

When in "E2: Emergency state", upon receiving an indication from the MCVideo user to cancel an emergency alert, the MCVideo client:

Editor's Note: Authorization check to cancel emergency alert is FFS.

- 1) shall set the stored emergency state as "false";
- 2) shall generate a GROUP EMERGENCY ALERT CANCEL message as specified in subclause 17.1.16. In the GROUP EMERGENCY ALERT CANCEL message, the MCVideo client:
 - a) shall set the MCVideo group ID IE to the stored MCVideo group ID; and
 - b) shall set the Originating MCVideo user ID IE to own MCVideo user ID; and
- 3) shall send the GROUP EMERGENCY ALERT CANCEL message as specified in subclause 9.3.1.1.1;
- 4) shall stop timer TFE2 (emergency alert retransmission); and
- 5) shall enter "E1: Not in emergency state" state.

11.3.3.6 Terminating user receives GROUP EMERGENCY ALERT CANCEL message

When in state "E1: Not in emergency state" or in "E2: Emergency state", upon receiving a GROUP EMERGENCY ALERT CANCEL message with the Originating MCVideo user ID IE stored in the list of users in emergency, the MCVideo client:

- 1) shall remove the MCVideo user ID and associated location information from the stored list of users in emergency;
- 2) shall generate a GROUP EMERGENCY ALERT CANCEL ACK message as specified in subclause 17.1.17. In the GROUP EMERGENCY ALERT CANCEL ACK message, the MCVideo client:
 - a) shall set the MCVideo group ID IE to the MCVideo group ID IE of the received GROUP EMERGENCY ALERT CANCEL message; and
 - b) shall set the Sending MCVideo user ID IE to own MCVideo user ID; and
 - c) shall set the Originating MCVideo user ID IE to the Originating MCVideo user ID IE of the received GROUP EMERGENCY ALERT message;
- 3) shall send the GROUP EMERGENCY ALERT CANCEL ACK message as specified in subclause 9.3.1.1.1;
- 4) shall stop the associated timer TFE1 (Emergency Alert); and
- 5) shall remain in the current state.

11.3.3.7 Implicit emergency alert cancel

When in state "E1: Not in emergency state" or in "E2: Emergency state", upon expiry of timer TFE1 (Emergency Alert) associated with a stored MCVideo user ID, the MCVideo client:

- 1) shall remove the MCVideo user ID and associated location information from the stored list of users in emergency; and
- 2) shall remain in the current state.

12 Video Pull

12.1 General

12.2 On-network video pull

12.2.1 General

12.2.2 MCVideo client procedures

12.2.3 MCVideo server procedures

12.3 Off-network video pull

12.3.1 General

12.3.2 MCVideo client procedures

12.3.3 MCVideo server procedures

13 Video Push

13.1 General

13.2 On-network video push

13.2.1 General

13.2.2 MCVideo client procedures

13.2.3 MCVideo server procedures

13.3 Off-network video push

13.3.1 General

13.3.2 MCVideo client procedures

13.3.3 MCVideo server procedures

14 Capability information sharing

- 14.1 General
 - 14.2 On-network capability information sharing
 - 14.2.1 General
 - 14.2.2 MCVideo client procedures
 - 14.2.3 MCVideo server procedures
 - 14.3 Off-network capability information sharing
 - 14.3.1 General
 - 14.3.2 MCVideo client procedures
 - 14.3.3 MCVideo server procedures
-

- 15 Ambient viewing call
 - 15.1 General
 - 15.2 MCVideo client procedures
 - 15.3 MCVideo server procedures
-

- 16 Use of MBMS transmission (on-network)
 - 16.1 General
 - 16.2 MCVideo client procedures
 - 16.3 MCVideo server procedures
-

- 17 Off-network message formats
 - 17.1 MONP message functional definitions and contents
 - 17.1.1 General

The following subclauses describe the MONP message functional definitions and contents. Each message consist of a series of information elements. Annex I of 3GPP TS 24.379 [40] describes the standard format of a MONP message and the encoding rules for each type of information element.

17.1.2 GROUP CALL PROBE message

17.1.2.1 Message definition

This message is sent by the UE to other UEs to check for an ongoing group call. For contents of the message see Table 17.1.2.1-1.

Message type: GROUP CALL PROBE

Direction: UE to other UEs

Table 17.1.2.1-1: GROUP CALL PROBE message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Group call probe message identity	Message type 17.2.2	M	V	1
	MCVideo group ID	MCVideo group ID 17.2.5	M	LV-E	3-x

17.1.3 GROUP CALL ANNOUNCEMENT message

17.1.3.1 Message definition

This message is sent by the UE to other UEs to announce an ongoing group call to other UEs. For contents of the message see Table 17.1.3.1-1.

Message type: GROUP CALL ANNOUNCEMENT

Direction: UE to other UEs

Table 17.1.3.1-1: GROUP CALL ANNOUNCEMENT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Group call announcement message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	Call type	Call type 17.2.11	M	V	1
	Refresh interval	Refresh interval 17.2.4	M	V	2
	Call start time	Call start time 17.2.14	M	V	5
	Last call type change time	Last call type change time 17.2.15	M	V	5
	MCVideo group ID	MCVideo group ID 17.2.5	M	LV-E	3-x
	SDP	SDP 17.2.6	M	LV-E	3-x
	Originating MCVideo user ID	MCVideo user ID 17.2.10	M	LV-E	3-x
	Last user to change call type	MCVideo User ID 17.2.10	M	LV-E	3-x
80	Confirm mode indication	Confirm mode indication 17.2.9	O	T	1
81	Probe response	Probe response 17.2.16	O	T	1

17.1.4 GROUP CALL ACCEPT message

17.1.4.1 Message definition

This message is sent by the UE to other UEs to indicate acceptance of a group call. For contents of the message see Table 17.1.4.1-1.

Message type: GROUP CALL ACCEPT

Direction: UE to other UEs

Table 17.1.4.1-1: GROUP CALL ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Group call accept message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	Call type	Call type 17.2.11	M	V	1
	MCVideo group ID	MCVideo group ID 17.2.5	M	LV-E	3-x
	Sending MCVideo user ID	MCVideo user ID 17.2.10	M	LV-E	3-x

17.1.5 PRIVATE CALL SETUP REQUEST message

17.1.5.1 Message definition

This message is sent by a UE to another UE to request setup of a private call. For contents of the message see Table 17.1.5.1-1.

Message type: PRIVATE CALL SETUP REQUEST

Direction: UE to another UE

Table 17.1.5.1-1: PRIVATE CALL SETUP REQUEST message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Private call setup request message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	Commencement mode	Commencement mode 17.2.7	M	V	1
	Call type	Call type 17.2.11	M	V	1
	MCVideo user ID of the caller	MCVideo user ID 17.2.10	M	LV-E	3-x
	MCVideo user ID of the callee	MCVideo user ID 17.2.10	M	LV-E	3-x
	SDP offer	SDP 17.2.6	M	LV-E	3-x
78	User location	User location 17.2.12	O	TLV-E	3-x

17.1.6 PRIVATE CALL RINGING message

17.1.6.1 Message definition

This message is automatically sent by a UE to another UE in response to a PRIVATE CALL SETUP REQUEST message. This message indicates that the UE has presented the incoming call notification to the user and is awaiting user response. For contents of the message see Table 17.1.6.1-1.

Message type: PRIVATE CALL RINGING

Direction: UE to another UE

Table 17.1.6.1-1: PRIVATE CALL RINGING message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Private call ringing message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	MCVideo user ID of the caller	MCVideo user ID 17.2.10	M	LV-E	3-x
	MCVideo user ID of the callee	MCVideo user ID 17.2.10	M	LV-E	3-x

17.1.7 PRIVATE CALL ACCEPT message

17.1.7.1 Message definition

This message is sent by a UE to another UE in response to a PRIVATE CALL SETUP REQUEST message when user accepts the call. This message indicates that the UE accepts the call setup request. For contents of the message see Table 17.1.7.1-1.

Message type: PRIVATE CALL ACCEPT

Direction: UE to another UE

Table 17.1.7.1-1: PRIVATE CALL ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Private call accept message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	MCVideo user ID of the caller	MCVideo user ID 17.2.10	M	LV-E	3-x
	MCVideo user ID of the callee	MCVideo user ID 17.2.10	M	LV-E	3-x
	SDP answer	SDP 17.2.6	M	LV-E	3-x

17.1.8 PRIVATE CALL REJECT message

17.1.8.1 Message definition

This message is sent by a UE to another UE in response to a PRIVATE CALL SETUP REQUEST message when user rejects the call. This message indicates that the UE rejects the call setup request. For contents of the message see Table 17.1.8.1-1.

Message type: PRIVATE CALL REJECT

Direction: UE to another UE

Table 17.1.8.1-1: PRIVATE CALL REJECT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Private call reject message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	Reason	Reason 17.2.8	M	V	1
	MCVideo user ID of the caller	MCVideo user ID 17.2.10	M	LV-E	3-x
	MCVideo user ID of the callee	MCVideo user ID 17.2.10	M	LV-E	3-x

17.1.9 PRIVATE CALL RELEASE message

17.1.9.1 Message definition

This message is sent by a UE to another UE to terminate an ongoing private call. For contents of the message see Table 17.1.9.1-1.

Message type: PRIVATE CALL RELEASE

Direction: UE to another UE

Table 17.1.9.1-1: PRIVATE CALL RELEASE message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Private call release message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	MCVideo user ID of the caller	MCVideo user id 17.2.10	M	LV-E	3-x
	MCVideo user ID of the callee	MCVideo user id 17.2.10	M	LV-E	3-x

17.1.10 PRIVATE CALL RELEASE ACK message

17.1.10.1 Message definition

This message is sent by a UE to another UE in response to a PRIVATE CALL RELEASE message. This message indicates that the UE has terminated the call. For contents of the message see Table 17.1.10.1-1.

Message type: PRIVATE CALL RELEASE ACK

Direction: UE to another UE

Table 17.1.10.1-1: PRIVATE CALL RELEASE ACK message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Private call release ack message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	MCVideo user ID of the caller	MCVideo user id 17.2.10	M	LV-E	3-x
	MCVideo user ID of the callee	MCVideo user ID 17.2.10	M	LV-E	3-x

17.1.11 PRIVATE CALL ACCEPT ACK message

17.1.11.1 Message definition

This message is sent by a UE to another UE in response to a PRIVATE CALL ACCEPT message. This message acknowledges the receipt of PRIVATE CALL ACCEPT message. For contents of the message see Table 17.1.11.1-1.

Message type: PRIVATE CALL ACCEPT ACK

Direction: UE to another UE

Table 17.1.11.1-1: PRIVATE CALL ACCEPT ACK message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Private call accept ack message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	MCVideo user ID of the caller	MCVideo user ID 17.2.10	M	LV-E	3-x
	MCVideo user ID of the callee	MCVideo user ID 17.2.10	M	LV-E	3-x

17.1.12 GROUP CALL IMMINENT PERIL END message

17.1.12.1 Message definition

This message is sent by the UE to other UEs to indicate termination of imminent peril mode in the group call. For contents of the message see Table 17.1.12.1-1.

Message type: GROUP CALL IMMINENT PERIL END

Direction: UE to other UEs

Table 17.1.12.1-1: GROUP CALL IMMIDENT PERIL END message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Group call imminent peril end message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	Last call type change time	Last call type change time 17.2.16	M	V	5
	Last user to change call type	MCVideo User ID 17.2.10	M	LV-E	3-x
	MCVideo group ID	MCVideo group ID 17.2.5	M	LV-E	3-x
	Originating MCVideo user ID	MCVideo user ID 17.2.10	M	LV-E	3-x

17.1.13 GROUP CALL EMERGENCY END message

17.1.13.1 Message definition

This message is sent by the UE to other UEs to indicate termination of emergency mode in the group call. For contents of the message see Table 17.1.13.1-1.

Message type: GROUP CALL EMERGENCY END

Direction: UE to other UEs

Table 17.1.13.1-1: GROUP CALL EMERGENCY END message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Group call emergency end message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	Last call type change time	Last call type change time 17.2.16	M	V	5
	Last user to change call type	MCVideo User ID 17.2.10	M	LV-E	3-x
	MCVideo group ID	MCVideo group ID 17.2.5	M	LV-E	3-x
	Originating MCVideo user ID	MCVideo user ID 17.2.10	M	LV-E	3-x

17.1.14 GROUP EMERGENCY ALERT message

17.1.14.1 Message definition

This message is sent by the UE to other UEs to indicate an emergency situation. For contents of the message see Table 17.1.14.1-1.

Message type: GROUP EMERGENCY ALERT

Direction: UE to other UEs

Table 17.1.14.1-1: GROUP EMERGENCY ALERT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Group emergency alert message identity	Message type 17.2.2	M	V	1
	MCVideo group ID	MCVideo group ID 17.2.5	M	LV-E	3-x
	Originating MCVideo user ID	MCVideo user ID 17.2.10	M	LV-E	3-x
	Organization name	Organization name 17.2.13	M	LV-E	3-x
78	User location	User location 17.2.12	O	TLV-E	4-x

17.1.15 GROUP EMERGENCY ALERT ACK message

17.1.15.1 Message definition

This message is sent by the UE to other UEs to indicate receipt of emergency alert. For contents of the message see Table 17.1.15.1-1.

Message type: GROUP EMERGENCY ALERT ACK

Direction: UE to other UEs

Table 17.1.15.1-1: GROUP EMERGENCY ALERT ACK message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Group emergency alert ack message identity	Message type 17.2.2	M	V	1
	MCVideo group ID	MCVideo group ID 17.2.5	M	LV-E	3-x
	Originating MCVideo user ID	MCVideo user ID 17.2.10	M	LV-E	3-x
	Sending MCVideo user ID	MCVideo user ID 17.2.10	M	LV-E	3-x

17.1.16 GROUP EMERGENCY ALERT CANCEL message

17.1.16.1 Message definition

This message is sent by the UE to other UEs to indicate end of emergency situation. For contents of the message see Table 17.1.16.1-1.

Message type: GROUP EMERGENCY ALERT CANCEL

Direction: UE to other UEs

Table 17.1.16.1-1: GROUP EMERGENCY ALERT CANCEL message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Group emergency alert cancel message identity	Message type 17.2.2	M	V	1
	MCVideo group ID	MCVideo group ID 17.2.5	M	LV-E	3-x
	Originating MCVideo user ID	MCVideo User ID 17.2.10	M	LV-E	3-x
	Sending MCVideo user ID	MCVideo user ID 17.2.10	M	LV-E	3-x

17.1.17 GROUP EMERGENCY ALERT CANCEL ACK message

17.1.17.1 Message definition

This message is sent by the UE to other UEs to indicate receipt of emergency alert cancel. For contents of the message see Table 17.1.17.1-1.

Message type: GROUP EMERGENCY ALERT CANCEL ACK

Direction: UE to other UEs

Table 17.1.17.1-1: GROUP EMERGENCY ALERT CANCEL ACK message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Group emergency alert cancel ack message identity	Message type 17.2.2	M	V	1
	MCVideo group ID	MCVideo group ID 17.2.5	M	LV-E	3-x
	Originating MCVideo user ID	MCVideo User ID 17.2.10	M	LV-E	3-x
	Sending MCVideo user ID	MCVideo user ID 17.2.10	M	LV-E	3-x

17.1.18 GROUP CALL BROADCAST message

17.1.18.1 Message definition

This message is sent by the UE to other UEs to announce a broadcast group call to other UEs. For contents of the message see Table 17.1.18.1-1.

Message type: GROUP CALL BROADCAST

Direction: UE to other UEs

Table 17.1.18.1-1: GROUP CALL BROADCAST message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Group call broadcast message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	Call type	Call type 17.2.11	M	V	1
	Originating MCVideo user ID	MCVideo user ID 17.2.10	M	LV-E	3-x
	MCVideo group ID	Group ID 17.2.5	M	LV-E	3-x
	SDP	SDP 17.2.6	M	LV-E	3-x

17.1.19 GROUP CALL BROADCAST END message

17.1.19.1 Message definition

This message is sent by the UE to other UEs to indicate termination of a broadcast group call. For contents of the message see Table 17.1.19.1-1.

Message type: GROUP CALL BROADCAST END

Direction: UE to other UEs

Table 17.1.19.1-1: GROUP CALL BROADCAST END message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Group call broadcast end message identity	Message type 17.2.2	M	V	1
	Call identifier	Call identifier 17.2.3	M	V	2
	MCVideo group ID	MCVideo group ID 17.2.5	M	LV-E	3-x
	Originating MCVideo user ID	MCVideo user ID 17.2.10	M	LV-E	3-x

17.2 General message format and information elements coding

17.2.1 General

The least significant bit of a field is represented by the lowest numbered bit of the highest numbered octet of the field. When the field extends over more than one octet, the order of bit values progressively decreases as the octet number increases.

Figure 17.2.1-1 shows an example of a field where the most significant bit of the field is marked MSB and the least significant bit of the field is marked LSB.

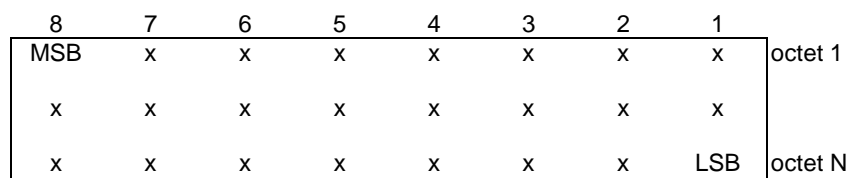


Figure 17.2.1-1: Example of bit ordering of a field

Within the protocols defined in the present document, the message consists of the following parts:

- a) message type information element; and
- b) other information elements, as required.

The organization of a message is illustrated in the example shown in Figure 17.2.1-2.

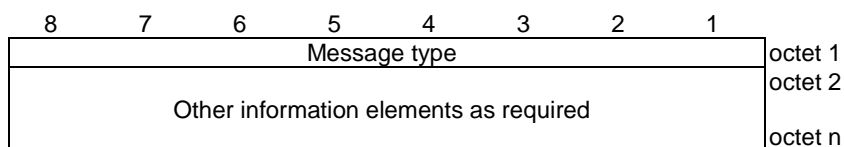


Figure 17.2.1-2: General message organization example

Unless specified otherwise in the message descriptions of subclause 17.1, a particular information element shall not be present more than once in a given message.

The sending entity shall set value of a spare bit to zero. The receiving entity shall ignore value of a spare bit

The sending entity shall not set a value of an information element to a reserved value. The receiving entity shall discard message containing an information element set to a reserved value.

17.2.2 Message type

The purpose of the Message type information element is to identify the type of the message.

The value part of the Message type information element is coded as shown in Table 17.2.2-1.

The Message type information element is a type 3 information element with a length of 1 octet.

Table 17.2.2-1: Message types

Bits								
8	7	6	5	4	3	2	1	
1	0	0	0	0	0	0	1	GROUP CALL PROBE
1	0	0	0	0	0	1	0	GROUP CALL ANNOUNCEMENT
1	0	0	0	0	0	1	1	GROUP CALL ACCEPT
1	0	0	0	0	1	0	0	GROUP CALL EMERGENCY END
1	0	0	0	0	1	0	1	GROUP CALL IMMINENT PERIL END
1	0	0	0	0	1	1	0	GROUP CALL BROADCAST
1	0	0	0	0	1	1	1	GROUP CALL BROADCAST END
1	0	0	0	1	0	0	0	PRIVATE CALL SETUP REQUEST
1	0	0	0	1	0	0	1	PRIVATE CALL RINGING
1	0	0	0	1	0	1	0	PRIVATE CALL ACCEPT
1	0	0	0	1	0	1	1	PRIVATE CALL REJECT
1	0	0	0	1	1	0	0	PRIVATE CALL RELEASE
1	0	0	0	1	1	0	1	PRIVATE CALL RELEASE ACK
1	0	0	0	1	1	1	0	PRIVATE CALL ACCEPT ACK
1	0	0	0	1	1	1	1	GROUP EMERGENCY ALERT
1	0	0	1	0	0	0	0	GROUP EMERGENCY ALERT ACK
1	0	0	1	0	0	0	1	GROUP EMERGENCY ALERT CANCEL
1	0	0	1	0	0	1	0	GROUP EMERGENCY ALERT CANCEL ACK

All other values are reserved.

17.2.3 Call identifier

The purpose of the Call identifier information element is to uniquely identify the call.

The Call identifier information element is coded as shown in Figure 17.2.3-1 and Table 17.2.3-1.

The Call identifier information element is a type 3 information element with a length of 2 octets.

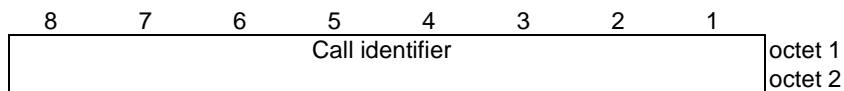


Figure 17.2.3-1: Call identifier information element

Table 17.2.3-1: Call identifier information element

Call identifier value (octet 1 to 2)
The Call identifier contains a number uniquely identifying the call.

17.2.4 Refresh interval

The refresh interval information identifier is used to indicate the minimum time period between successive periodic messages;

The Refresh interval information element is coded as shown in Figure 17.2.4-1 and Table 17.2.4-1.

The Refresh interval information element is a type 3 information element with a length of 2 octets.

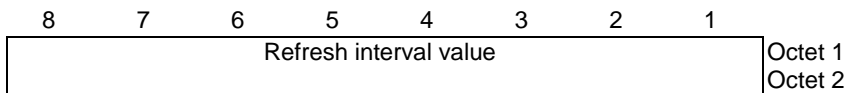


Figure 17.2.4-1: Refresh interval

Table 17.2.4-1: Refresh interval information element

Refresh interval value (octet 1 to 2)
The Refresh interval contains a number denoting the minimum time interval (milliseconds) between two successive periodic announcements.

17.2.5 MCVideo group ID

The MCVideo group ID information element is used to indicate the destination MCVideo group identifier;

The MCVideo group ID information element is coded as shown in Figure 17.2.5-1 and Table 17.2.5-1.

The MCVideo group ID information element is a type 6 information element.

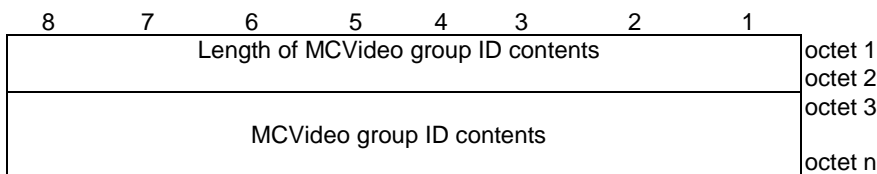


Figure 17.2.5-1: MCVideo group ID information element

Table 17.2.5-1: MCVideo group ID information element

MCVideo group ID is contained in octet 3 to octet n; Max value of 65535 octets.

17.2.6 SDP

The purpose of the SDP information element is to contain SDP message.

The SDP information element is coded as shown in Figure 17.2.6-1 and Table 17.2.6-1.

The SDP information element is a type 6 information element.

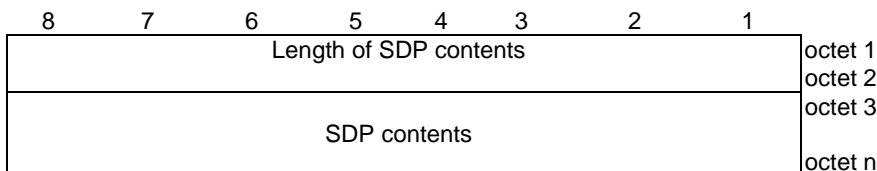


Figure 17.2.6-1: SDP information element

Table 17.2.6-1: SDP information element

SDP message container contents (octet 3 to octet n); Max value of 65535 octets.
This information element contains SDP message as defined in Section 10.2.1.1.2 or 11.2.1.1.2.

17.2.7 Commencement mode

The purpose of the Commencement mode information element is to identify the type of the commencement mode of the private call.

The value part of the Commencement mode information element is coded as shown in Table 17.2.7-1.

The Commence mode information element is a type 3 information element with a length of 1 octet.

Table 17.2.7-1: Commencement mode

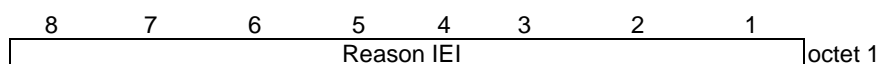
Bits								
8	7	6	5	4	3	2	1	
0	0	0	0	0	0	0	0	AUTOMATIC COMMENCEMENT MODE
0	0	0	0	0	0	0	1	MANUAL COMMENCEMENT MODE
All other values are reserved.								

17.2.8 Reason

The purpose of the Reason information element is to indicate the reason of the reject.

The Reason information element is coded as shown in figure 17.2.8-1.

The Reason information element is a type 3 information element.

**Figure 17.2.8-1: Reason information element****Table 17.2.8-1: Reason type**

Bits								
8	7	6	5	4	3	2	1	
0	0	0	0	0	0	0	0	REJECT
0	0	0	0	0	0	0	1	MEDIA FAILURE
0	0	0	0	0	0	1	0	BUSY
0	0	0	0	0	0	1	1	E2E SECURITY CONTEXT FAILURE
0	0	0	0	0	1	0	0	FAILED
All other values are reserved.								

17.2.9 Confirm mode indication

The purpose of the Confirm mode indication information element is to indicate that the terminating MCVideo client is expected to confirm call acceptance.

The Confirm mode indication information element is coded as shown in figure 17.2.9-1.

The Confirm mode indication information element is a type 2 information element.

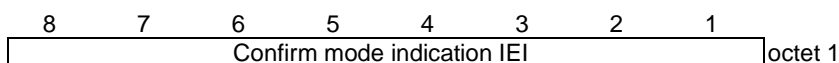


Figure 17.2.9-1: Confirm mode indication information element

17.2.10 MCVideo user ID

The MCVideo user ID information element is used to indicate an MCVideo user ID.

The MCVideo user ID information element is coded as shown in Figure 17.2.10-1 and Table 17.2.10-1.

The MCVideo user ID information element is a type 6 information element.

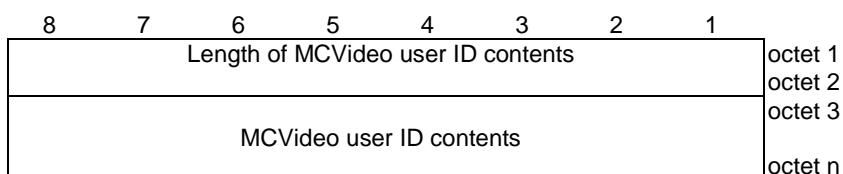


Figure 17.2.10-1: MCVideo user ID information element

Table 17.2.10-1: MCVideo user ID information element

MCVideo user ID is contained in octet 3 to octet n; Max value of 65535 octets.

17.2.11 Call type

The purpose of the Call type information element is to identify the type of the call.

The value part of the Call type information element is coded as shown in Table 17.2.11-1.

The Call type information element is a type 3 information element with a length of 1 octet.

Table 17.2.11-1: Call type

Bits								
8	7	6	5	4	3	2	1	
0	0	0	0	0	0	0	1	BASIC GROUP CALL
0	0	0	0	0	0	1	0	BROADCAST GROUP CALL
0	0	0	0	0	0	1	1	EMERGENCY GROUP CALL
0	0	0	0	0	1	0	0	IMMINENT PERIL GROUP CALL
0	0	0	0	0	1	0	1	PRIVATE CALL
All other values are reserved.								

17.2.12 User location

The User location information element is used to indicate the current location of the MCVideo client;

The User location information element is coded as shown in Figure 17.2.12-1 and Table 17.2.12-1.

The User location information element is a type 6 information element.

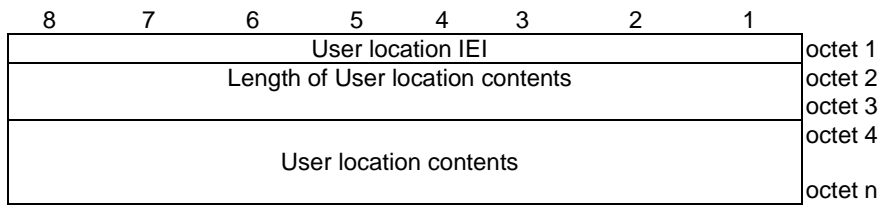


Figure 17.2.12-1: User location information element

Table 17.2.12-1: User location information element

User location is contained in octet 4 to octet n; Max value of 65535 octets.

The User location information element contains the LocationInfo structure defined in subclause 7.4 of 3GPP TS 29.199-9 [9].

17.2.13 Organization name

The Organization name information element is used to indicate the name of the organization to which the user belongs.

The Organization name information element is coded as shown in Figure 17.2.13-1 and Table 17.2.13-1.

The Organization name information element is a type 6 information element.

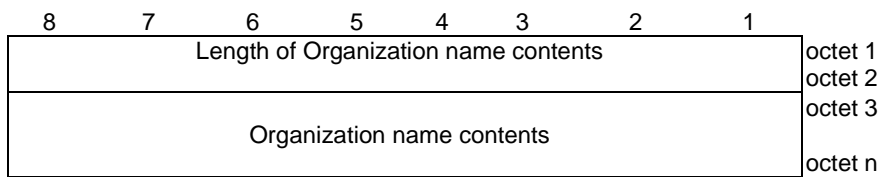


Figure 17.2.13-1: Organization name information element

Table 17.2.13-1: Organization name information element

Organization name is contained in octet 3 to octet n; Max value of 65535 octets.

17.2.14 Call start time

The Call start time information element is used to indicate the UTC time when a call was started.

The Call start time information element is coded as shown in Figure 17.2.14-1 and Table 17.2.14-1.

The Call start time information element is a type 3 information element with a length of 5 octets.

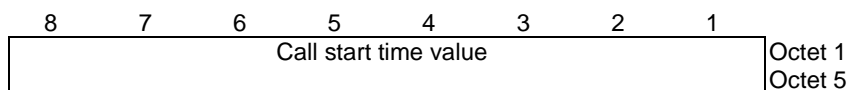


Figure 17.2.14-1: Call start time value

Table 17.2.14-1: Call start time value

Call start time value (octet 1 to 5)

The Call start time value is an unsigned integer containing UTC time of the time when a call was started, in seconds since midnight UTC of January 1, 1970 (not counting leap seconds).

17.2.15 Last call type change time

The Last call type change time information identifier is used to indicate the last UTC time when a call priority was changed.

The Last call type change time information element is coded as shown in Figure 17.2.15-1 and Table 17.2.15-1.

The Last call type change time information element is a type 3 information element with a length of 5 octets.

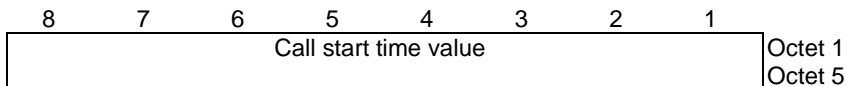


Figure 17.2.15-1: Call start time value

Table 17.2.15-1: Call start time value

<p>Last call type change time (octet 1 to 5)</p> <p>The Last call type change time value is an unsigned integer containing UTC time of the time when a call priority was changed, in seconds since midnight UTC of January 1, 1970 (not counting leap seconds).</p>

17.2.16 Probe response

The purpose of the probe response information element is to indicate that the GROUP CALL ANNOUNCEMENT message was sent in response of a GROUP CALL PROBE message.

The probe response information element is coded as shown in figure 17.2.16-1.

The probe response is a type 2 information element.

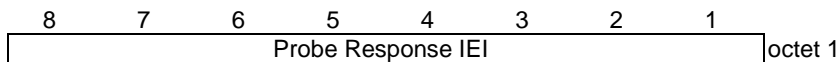


Figure 17.2.16-1: Probe response information element

Annex A (informative): Signalling flows

NOTE: the current version of this specification does not include example signalling flows.

Annex B (informative): Timers

B.1 General

The following tables give a brief description of the timers used in the present document.

For the on-network timers described in the present document, the following timer families are used:

- TNGx: Timer oN-network Group call x

For the off-network timers described in the present document, the following timer families are used:

- TFGx: Timer oFf-network Group call x
- TFPy: Timer oFf-network Private call y
- TFBz: Timer oFf-network Broadcast group call z

where x, y and z represent numbers.

B.2 On-network timers

B.2.1 Timers in the controlling MCVideo function

The table B.2.1-1 provides a description of the timers used by the controlling MCVideo function, specifies the timer values, describes the reason for starting of the timer, normal stop and the action on expiry.

Table B.2.1-1: controlling MCVideo function timers

Timer	Timer value	Cause of start	Normal stop	On expiry

B.3 Off-network timers

B.3.1 Timers in off-network group call

B.3.1.1 Basic call control

Editor's Note: Reference to the configuration specification needs to be added.

The table B.3.1.1-1 lists the timers used in basic call control, their start values, their limits, describes the cause of the start, and the action to take on normal stop and on expiry.

Table B.3.1.1-1: Timers in basic call control

Timer	Timer value	Cause of start	Normal stop	On expiry
TFG1 (wait for call announcement)	Default value: 150 millisecond Configurable.	When the client sends a CALL PROBE message.	Reception of a CALL ANNOUNCEMENT message.	Send a CALL ANNOUNCEMENT message.
TFG2 (call announcement)	Calculated. Refer to section 9.3.2.4.1.1.	Commencement of group call. Restarted every time a CALL PROBE message is received OR CALL ANNOUNCEMENT message is sent or received.	Termination of group call. When the client Receives a CALL PROBE message or CALL ANNOUNCEMENT message, Re-calculate timer value and restart.	Send a CALL ANNOUNCEMENT message. Re-calculate timer value and restart.
TFG3 (call probe retransmission)	Default value: 40 millisecond Depends on the characteristic of the D2D (D2D Sidelink period) Configurable.	When the client sends a CALL PROBE message.	Reception of a CALL ANNOUNCEMENT message. Or TFG1 Expires. Or User releases the call.	Send a CALL PROBE message.
TFG4 (waiting for the user)	Default value: 30 seconds Maximum value: 60 seconds Configurable.	Reception of CALL ANNOUNCEMENT message when not participating in the ongoing call.	Reception of User action (Accept or Reject).	Stop incoming call notification.
TFG5 (not present incoming call announcements)	Default value: 30 seconds Configurable.	Expiration of TFG4 Or User rejects the call. Or User releases the call.	-	Reset group call state machine.
TFG6 (Max duration)	Calculated. Refer to section 9.3.2.4.1.2.	Commencement of group call	Termination of group call	Release the group call

B.3.1.2 Call type control

Editor's Note: Reference to the configuration specification needs to be added.

The table B.3.1.2-1 lists the timers used in call type control, their star values, describes the cause of start, and the action to take on normal stop and on expiry.

Table B.3.1.2-1: Call type control

Timer	Timer value	Cause of start	Normal stop	On expiry
TFG11 (emergency end retransmission)	Default value: 1 second Configurable.	When the client sends a GROUP CALL EMERGENCY END message.	-	Send a GROUP CALL EMERGENCY END message Increment associated counter by 1. If counter has reached limit, stop the timer.
TFG12 (imminent peril end retransmission)	Default value: 1 second Configurable.	When the client sends a GROUP CALL IMMINENT PERIL END message.	-	Send a GROUP CALL IMMINENT PERIL END message Increment associated counter by 1. If counter has reached limit, stop the timer.
TFG13 (implicit downgrade emergency)	Calculated. Refer to subclause 9.3.3.4.1.1.	Upgrade of the call to emergency group call.	Downgrade of the call.	Downgrade the call.
TFG14 (implicit downgrade imminent peril)	Calculated. Refer to subclause 9.3.3.4.1.2.	Upgrade of the call to imminent peril call.	Downgrade of the call.	Downgrade the call.

B.3.2 Timers in off-network private call

Editor's Note: Reference to the configuration specification needs to be added.

The table B.3.2-1 lists the timers used in off-network private call, their start values, their limits, describes the cause of start, and the action to take on normal stop and on expiry.

Table B.3.2-1: Timers in off-network private call

Timer	Timer value	Cause of start	Normal stop	On expiry
TFP1 (private call request retransmission)	Default value: 40 millisecond Depends on the characteristic of the D2D (D2D Sidelink period) Configurable.	When the client sends a PRIVATE CALL SETUP REQUEST message.	Reception of a PRIVATE CALL ACCEPT or PRIVATE CALL REJECT message.	Resend PRIVATE CALL SETUP REQUEST message. Increment associated counter by 1. If counter has reached limit, assume the called client is not available. Terminate call setup.
TFP2 (waiting for call response message)	Default value: 30 seconds Maximum value: 60 seconds Configurable.	Reception of a PRIVATE CALL SETUP REQUEST message.	User responds to the incoming call notification.	Start TFP7 timer. Send a PRIVATE CALL REJECT message
TFP3 (private call release retransmission)	Default value: 40 millisecond Depends on the characteristic of the D2D (D2D Sidelink period) Configurable.	When the client sends a PRIVATE CALL RELEASE message.	Reception of PRIVATE CALL RELEASE ACK message.	Resend PRIVATE CALL RELEASE message. Increment associated counter by 1. If counter has reached limit, assume the receiving client is not available anymore. Release the call.
TFP4 (private call accept retransmission)	Default value: 40 millisecond Depends on the characteristic of the D2D (D2D Sidelink period) Configurable.	When the client sends a PRIVATE CALL ACCEPT message.	Reception of a PRIVATE CALL ACCEPT ACK message or RTP media.	Resend PRIVATE CALL ACCEPT message. Increment associated counter by 1. If counter has reached limit, assume the receiving client is not available anymore Notify call setup failure.
TFP5 (max duration)	Configurable.	Call establishment.	Call termination.	Terminate the call.
TFP7 (waiting for any message with same call identifier)	Default value: 1 second Configurable.	Rejection of a call OR Termination of a call OR Call Failure.	-	Reset the call control state machine.

B.3.3 Timers in off-network broadcast call

Editor's Note: Reference to the configuration specification needs to be added.

The table B.3.3-1 lists the timers used in off-network broadcast call, their start values, their limits, describes the cause of start, and the action to take on normal stop and on expiry.

Table B.3.3-1: Timers in off-network broadcast call

Timer	Timer value	Cause of start	Normal stop	On expiry
TFB1 (max duration)	Default value: 300 seconds Maximum value: 600 seconds Configurable.	Start of the broadcast call.	-	Terminate the broadcast call.
TFB2 (broadcast retransmission)	Default value: 3 seconds Maximum value: 10 seconds Configurable.	Start of the broadcast call.	Broadcast call termination.	Send GROUP CALL BROADCAST message.
TFB3 (waiting for the user)	Default value: 30 seconds Maximum value: 60 seconds Configurable.	Receipt of GROUP CALL BROADCAST message when user response is required.	Response from user.	Terminate incoming call notification.

B.3.4 Timers in off-network emergency alert

Editor's Note: Reference to the configuration specification needs to be added.

The table B.3.4-1 lists the timers used in off-network emergency alert, their start values, their limits, describes the cause of start, and the action to take on normal stop and on expiry.

Table B.3.4-1: Timers in off-network emergency alert

Timer	Timer value	Cause of start	Normal stop	On expiry
TFE1 (Emergency Alert)	Default value: 30 seconds Maximum value: 60 seconds Configurable.	Receipt of GROUP EMERGENCY ALERT.	Receipt of GROUP EMERGENCY ALERT CANCEL.	Assume end of emergency state, remove associated user from the list.
TFE2 (emergency alert retransmission)	Default value: 5 seconds Maximum value: 10 seconds Configurable.	Transmission of GROUP EMERGENCY ALERT.	Transmission of GROUP EMERGENCY ALERT CANCEL.	Transmit GROUP EMERGENCY ALERT.

Annex C (normative): Counters

C.1 General

The following tables give a brief description of the counters used in the present document.

C.2 Off-network counters

C.2.1 Counters in off-network group call

Editor's Note: Reference to the configuration specification needs to be added.

The table C.2.1-1 lists the counters used in off-network group call, their default upper limits and the action to take upon reaching the upper limit. The counters start at 1.

Table C.2.1-1: Counters in off-network group call

Counter	Upper Limit	Associated timer	Upon reaching the upper limit
CFG11 (emergency end retransmission)	Default value: 5 Configurable.	TFG11	Stop timer TFG11.
CFG12 (imminent peril end retransmission)	Default value: 5 Configurable.	TFG12	Stop timer TFG12.

C.2.2 Counters in off-network private call

Editor's Note: Reference to the configuration specification needs to be added.

The table C.2.2-1 lists the counters used in off-network private call, their default upper limits and the action to take upon reaching the upper limit. The counters start at 1.

Table C.2.2-1: Counters in off-network private call

Counter	Upper Limit	Associated timer	Upon reaching the upper limit
CFP1 (private call request retransmission)	Default value: 3 Configurable.	TFP1	Assume the called client is not available. Terminate call setup.
CFP3 (private call release retransmission)	Default value: 3 Configurable.	TFP3	Assume the receiving client is not available anymore. Release the call.
CFP4 (private call accept retransmission)	Default value: 3 Configurable.	TFP4	Notify call setup failure.

Annex D (normative): Media feature tags and feature-capability indicators used within the current document

D.1 General

This subclause describes the media feature tag definitions that are applicable for the 3GPP IM CN Subsystem for the realisation of the Mission Critical Video (MCVideo) service.

D.2 Definition of media feature tag g.3gpp.mcvideo

Media feature tag name: g.3gpp.mcvideo

Editor's Note: this media feature tag needs to be registered with IANA when the release 14 is completed.

ASN.1 Identifier: 1.3.6.1.8.2.x

Summary of the media feature indicated by this media feature tag: This media feature tag when used in a SIP request or a SIP response indicates that the function sending the SIP message supports Mission Critical Video (MCVideo) communication.

Values appropriate for use with this media feature tag: Boolean

The media feature tag is intended primarily for use in the following applications, protocols, services, or negotiation mechanisms: This media feature tag is most useful in a communications application, for describing the capabilities of a device, such as a phone or PDA.

Examples of typical use: Indicating that a mobile phone supports the Mission Critical Video (MCVideo) communication.

Related standards or documents: 3GPP TS 24.281: "Mission Critical Video (MCVideo) signalling control; Protocol specification"

Security Considerations: Security considerations for this media feature tag are discussed in subclause 11.1 of IETF RFC 3840 [22].

Annex E (normative): ICSI values defined within the current document

E.1 General

This subclause describes the IMS communications service identifier definitions that are applicable for the 3GPP IM CN subsystem for the realisation of the Mission Critical Video (MCVideo) service.

NOTE: The template has been created using the headers of the table in <http://www.3gpp.org/specifications-groups/34-uniform-resource-name-urn-list>

E.2 Definition of ICSI value for MCVideo service

E.2.1 URN

urn:urn-7:3gpp-service.ims.icsi.mcvideo

E.2.2 Description

This URN indicates that the device has the capabilities to support the mission critical video (MCVideo) service.

E.2.3 Reference

3GPP TS 24.281: "Mission Critical Video (MCVideo) call control Protocol specification"

E.2.3 Contact

Name: <MCC name>

Email: <MCC email address>

E.2.4 Registration of subtype

Yes

E.2.5 Remarks

None

Annex F (normative): XML schemas

F.1 XML schema for MCVideo Information

F.1.1 General

This subclause defines XML schema and MIME type for MCVideo information.

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:mvideoInfo:1.0"
  xmlns:mvideoinfo="urn:3gpp:ns:mvideoInfo:1.0"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified"
  xmlns:xenc="http://www.w3.org/2001/04/xmenc#"

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

  <!-- root XML element -->
  <xs:element name="mvideoinfo" type="mvideoinfo:mvideoinfo-Type" id="info"/>

  <xs:complexType name="mvideoinfo-Type">
    <xs:sequence>
      <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
      <xs:element name="anyExt" type="mvideoinfo:anyExtType" minOccurs="0" />
    </xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax" />
  </xs:complexType>

  <xs:element name="mvideo-Params" type="mvideoinfo:mvideo-ParamsType" />

  <xs:complexType name="mvideo-ParamsType">
    <xs:sequence>
      <xs:element name="mvideo-access-token" type="mvideoinfo:contentType" minOccurs="0" />
      <xs:element name="session-type" type="xs:string" minOccurs="0" />
      <xs:element name="mvideo-request-uri" type="mvideoinfo:contentType" minOccurs="0" />
      <xs:element name="mvideo-calling-user-id" type="mvideoinfo:contentType" minOccurs="0" />
      <xs:element name="mvideo-called-party-id" type="mvideoinfo:contentType" minOccurs="0" />
      <xs:element name="mvideo-calling-group-id" type="mvideoinfo:contentType" minOccurs="0" />
      <xs:element name="required" type="mvideoinfo:contentType" minOccurs="0" />
      <xs:element name="emergency-ind" type="mvideoinfo:contentType" minOccurs="0" />
      <xs:element name="alert-ind" type="mvideoinfo:contentType" minOccurs="0" />
      <xs:element name="imminentperil-ind" type="xs:boolean" 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="associated-group-id" type="xs:string" minOccurs="0" />
      <xs:element name="originated-by" type="mvideoinfo:contentType" minOccurs="0" />
      <xs:element name="mvideo-client-id" type="mvideoinfo:contentType" minOccurs="0" />
      <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
      <xs:element name="anyExt" type="mvideoinfo: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="mvideoURI" type="xs:anyURI" />
    </xs:choice>
  </xs:complexType>
```

```

    <xs:element name="mcvideoString" type="xs:string"/>
    <xs:element name="mcvideoBoolean" type="xs:boolean"/>
    <xs:any namespace="##other" processContents="lax"/>
    <xs:element name="anyExt" type="mcvideoinfo:anyExtType" minOccurs="0"/>
  </xs:choice>
  <xs:attribute name="type" type="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>

</xs:schema>

```

F.1.3 Semantic

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

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

If the <mcvideoinfo> contains the <mcvideo-Params> element then:

- 1) the <mcvideo-access-token>, <mcvideo-request-uri>, <mcvideo-calling-user-id>, <mcvideo-called-party-id>, <mcvideo-calling-group-id>, <emergency-ind>, <alert-ind>, <imminentperil-ind>, <originated-by> and <mcvideo-client-id> 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 the <mcvideo-request-uri>, <mcvideo-calling-user-id>, <mcvideo-called-party-id> or <mcvideo-calling-group-id> or <originated-by> then the <mcvideoURI> element is included;
 - c) if the element is the <mcvideo-access-token> or <mcvideo-client-id>, then the <mcvideoString> element is included; and
 - d) if the element is <emergency-ind>, <alert-ind> or <imminentperil-ind> elements then the <mcvideoBoolean> 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#>" 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 <mcvideoinfo> contains the <mcvideo-Params> element then:

- 1) the <mcvideo-access-token> can be included with the access token received during authentication procedure as described in 3GPP TS 24.482 [xx];
- 2) the <session-type> can be included with:
 - a) a value of "chat" to indicate that the MCVideo client wants to join a chat group call
 - b) a value of "prearranged" to indicate the MCVideo client wants to make a prearranged group call; or
 - c) a value of "private" to indicate the MCVideo client wants to make a private call;
- 3) the <mcvideo-request-uri> can be included with:
 - a) a value set to an MCVideo group ID or temporary MCVideo group ID when the <session-type> is set to a value of "prearranged" or "chat"; and
 - b) a value set to the MCVideo ID of the called MCVideo user when the <session-type> is set to a value of "private";
- 4) the <mcvideo-calling-user-id> can be included, set to MCVideo ID of the originating user;
- 5) the <mcvideo-called-party-id> can be included, set to the MCVideo ID of the terminating user;
- 6) the <mcvideo-calling-group-id> can be included to indicate the MCVideo group identity to the terminating user;
- 7) the <emergency-ind> can be:
 - a) set to "true" to indicate that the call that the MCVideo client is initiating is an emergency MCVideo call; or
 - b) set to "false" to indicate that the MCVideo client is cancelling an emergency MCVideo call (i.e. converting it back to a non-emergency call)
- 8) 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
- 9) 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 MCVideo client is initiating is an imminent peril group MCVideo call;
- 10) the <broadcast-ind> can be:
 - a) set to "true" indicates that the MCVideo client is initiating a broadcast group call; or
 - b) set to "false" indicates that the MCVideo client is initiating a non-broadcast group call;
- 11) the <mc-org> can be:
 - a) set to the MCVideo user's Mission Critical Organization in an emergency alert sent by the MCVideo server to terminating MCVideo clients;
- 12) the <associated-group-id>:
 - a) if the <mcvideo-request-uri> element contains a group identity then this element can include an MCVideo group ID associated with the group identity in the <mcvideo-request-uri> element. E.g. if the <mcvideo-request-uri> element contains a temporary group identity (TGI), then the <associated-group-id> element can contain the constituent MCVideo group ID;
- 13) the <originated-by>:
 - a) can be included, set to the MCVideo ID of the originating user of an MCVideo emergency alert when being cancelled by another authorised MCVideo user;
- 14) the <mcvideo-client-id>:

- a) can be included, set to the MCVideo client ID of the MCVideo client that originated a SIP INVITE request, SIP REFER request or SIP MESSAGE request.

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

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

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

F.1.4 IANA registration template

Editor's note: The MIME type `application/vnd.3gpp.mcvideo-info+xml` as defined in this subclause is to be registered in the IANA registry for Application Media Types based upon the following template. The registration is to be started when work on the MCImp-MCVIDEO-CT WID completes.

Your Name:

<MCC name>

Your Email Address:

<MCC email address>

Media Type Name:

Application

Subtype name:

vnd.3gpp.mcvideo-info+xml

Required parameters:

None

Optional parameters:

"charset" the parameter has identical semantics to the charset parameter of the "application/xml" media type as specified in section 9.1 of IETF RFC 7303.

Encoding considerations:

binary.

Security considerations:

Same as general security considerations for application/xml media type as specified in section 9.1 of IETF RFC 7303. In addition, this media type provides a format for exchanging information in SIP, so the security considerations from IETF RFC 3261 apply.

The information transported in this media type does not include active or executable content.

Mechanisms for privacy and integrity protection of protocol parameters exist. Those mechanisms as well as authentication and further security mechanisms are described in 3GPP TS 24.229.

This media type does not include provisions for directives that institute actions on a recipient's files or other resources.

This media type does not include provisions for directives that institute actions that, while not directly harmful to the recipient, may result in disclosure of information that either facilitates a subsequent attack or else violates a recipient's privacy in any way.

This media type does not employ compression.

Interoperability considerations:

Same as general interoperability considerations for application/xml media type as specified in section 9.1 of IETF RFC 7303. Any unknown XML elements and any unknown XML attributes are to be ignored by recipient of the MIME body.

Published specification:

3GPP TS 24.281 "Mission Critical Video (MCVideo) signalling control" version 14.0.0, available via <http://www.3gpp.org/specs/numbering.htm>.

Applications which use this media type:

Applications supporting the service continuity as described in the published specification.

Fragment identifier considerations:

The handling in section 5 of IETF RFC 7303 applies.

Restrictions on usage:

None

Provisional registration? (standards tree only):

N/A

Additional information:

1. Deprecated alias names for this type: none
2. Magic number(s): none
3. File extension(s): none
4. Macintosh File Type Code(s): none
5. Object Identifier(s) or OID(s): none

Intended usage:

Common

Person to contact for further information:

- Name: <MCC name>
- Email: <MCC email address>
- Author/Change controller:
 - i) Author: 3GPP CT1 Working Group/3GPP_TSG_CT_WG1@LIST.ETSI.ORG
 - ii) Change controller: <MCC name>/<MCC email address>

F.2 XML schema for MBMS usage information

F.3 XML schema for MCVideo location information

F.3.1 General

This subclause defines the XML schema and the MIME type for location information.

F.3.2 XML schema

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:mcvideoloc="urn:3gpp:ns:mcvideoLocationInfo:1.0"
targetNamespace="urn:3gpp:ns:mcvideoLocationInfo:1.0" elementFormDefault="qualified"
attributeFormDefault="unqualified"
xmlns:xenc="http://www.w3.org/2001/04/xmllenc#">

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

  <xs:element name="location-info" id="loc">
    <xs:annotation>
      <xs:documentation>Root element, contains all information related to location
configuration, location request and location reporting for the MCVideo service</xs:documentation>
    </xs:annotation>
    <xs:complexType>
      <xs:choice>
        <xs:element name="Configuration" type="mcvideoloc:tConfigurationType"/>
        <xs:element name="Request" type="mcvideoloc:tRequestType"/>
        <xs:element name="Report" type="mcvideoloc:tReportType"/>
        <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
        <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
      </xs:choice>
      <xs:anyAttribute namespace="##any" processContents="lax"/>
    </xs:complexType>
  </xs:element>
  <xs:complexType name="tConfigurationType">
    <xs:sequence>
      <xs:element name="NonEmergencyLocationInformation"
type="mcvideoloc:tRequestedLocationType" minOccurs="0"/>
      <xs:element name="EmergencyLocationInformation" type="mcvideoloc:tRequestedLocationType"
minOccurs="0"/>
      <xs:element name="TriggeringCriteria" type="mcvideoloc:TriggeringCriteriaType"/>
      <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="ConfigScope">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="Full"/>
          <xs:enumeration value="Update"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:anyAttribute namespace="##any" processContents="lax"/>
  </xs:complexType>
  <xs:complexType name="tRequestType">
    <xs:complexContent>
      <xs:extension base="mcvideoloc:tEmptyType">
        <xs:attribute name="RequestId" type="xs:string" use="required"/>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
  <xs:complexType name="tReportType">
    <xs:sequence>
      <xs:element name="TriggerId" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element name="CurrentLocation" type="mcvideoloc:tCurrentLocationType"/>
      <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="ReportID" type="xs:string" use="optional"/>
    <xs:attribute name="ReportType" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:string">

```

```

        <xs:enumeration value="Emergency" />
        <xs:enumeration value="NonEmergency" />
    </xs:restriction>
</xs:simpleType>
</xs:attribute>
<xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>
<xs:complexType name="TriggeringCriteriaType">
    <xs:sequence>
        <xs:element name="CellChange" type="mcvideoloc:tCellChange" minOccurs="0" />
        <xs:element name="TrackingAreaChange" type="mcvideoloc:tTrackingAreaChangeType"
minOccurs="0" />
        <xs:element name="PlmnChange" type="mcvideoloc:tPlmnChangeType" minOccurs="0" />
        <xs:element name="MbmsSaChange" type="mcvideoloc:tMbmsSaChangeType" minOccurs="0" />
        <xs:element name="MbsfnAreaChange" type="mcvideoloc:tMbsfnAreaChangeType"
minOccurs="0" />
        <xs:element name="PeriodicReport" type="mcvideoloc:tIntegerAttributeType"
minOccurs="0" />
        <xs:element name="TravelledDistance" type="mcvideoloc:tIntegerAttributeType"
minOccurs="0" />
        <xs:element name="McvideoSignallingEvent" type="mcvideoloc:tSignallingEventType"
minOccurs="0" />
        <xs:element name="GeographicalAreaChange" type="mcvideoloc:tGeographicalAreaChange" />
        <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
        <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0" />
    </xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>
<xs:complexType name="tCellChange">
    <xs:sequence>
        <xs:element name="AnyCellChange" type="mcvideoloc:tEmptyTypeAttribute" minOccurs="0" />
        <xs:element name="EnterSpecificCell" type="mcvideoloc:tSpecificCellType" minOccurs="0"
maxOccurs="unbounded" />
        <xs:element name="ExitSpecificCell" type="mcvideoloc:tSpecificCellType" minOccurs="0"
maxOccurs="unbounded" />
        <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
        <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0" />
    </xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>
<xs:complexType name="tEmptyType" />
<xs:simpleType name="tEcgi">
    <xs:restriction base="xs:string">
        <xs:pattern value="\d{3}\d{3}[0-1]{28}" />
    </xs:restriction>
</xs:simpleType>
<xs:complexType name="tSpecificCellType">
    <xs:simpleContent>
        <xs:extension base="mcvideoloc:tEcgi">
            <xs:attribute name="TriggerId" type="xs:string" use="required" />
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
<xs:complexType name="tEmptyTypeAttribute">
    <xs:complexContent>
        <xs:extension base="mcvideoloc:tEmptyType">
            <xs:attribute name="TriggerId" type="xs:string" use="required" />
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
<xs:complexType name="tTrackingAreaChangeType">
    <xs:sequence>
        <xs:element name="AnyTrackingAreaChange" type="mcvideoloc:tEmptyTypeAttribute"
minOccurs="0" />
        <xs:element name="EnterSpecificTrackingArea" type="mcvideoloc:tTrackingAreaIdentity"
minOccurs="0" maxOccurs="unbounded" />
        <xs:element name="ExitSpecificTrackingArea" type="mcvideoloc:tTrackingAreaIdentity"
minOccurs="0" maxOccurs="unbounded" />
        <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
        <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0" />
    </xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>
<xs:simpleType name="tTrackingAreaIdentityFormat">
    <xs:restriction base="xs:string">
        <xs:pattern value="\d{3}\d{3}[0-1]{16}" />
    </xs:restriction>
</xs:simpleType>

```

```

<xs:complexType name="tTrackingAreaIdentity">
  <xs:simpleContent>
    <xs:extension base="mcvideoloc:tTrackingAreaIdentityFormat">
      <xs:attribute name="TriggerId" type="xs:string" use="required"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="tPlmnChangeType">
  <xs:sequence>
    <xs:element name="AnyPlmnChange" type="mcvideoloc:tEmptyTypeAttribute" minOccurs="0"/>
    <xs:element name="EnterSpecificPlmn" type="mcvideoloc:tPlmnIdentity" minOccurs="0"
maxOccurs="unbounded"/>
    <xs:element name="ExitSpecificPlmn" type="mcvideoloc:tPlmnIdentity" minOccurs="0"
maxOccurs="unbounded"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>
<xs:simpleType name="tPlmnIdentityFormat">
  <xs:restriction base="xs:string">
    <xs:pattern value="\d{3}\d{3}"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="tPlmnIdentity">
  <xs:simpleContent>
    <xs:extension base="mcvideoloc:tPlmnIdentityFormat">
      <xs:attribute name="TriggerId" type="xs:string" use="required"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="tMbmsSaChangeType">
  <xs:sequence>
    <xs:element name="AnyMbmsSaChange" type="mcvideoloc:tEmptyTypeAttribute" minOccurs="0"/>
    <xs:element name="EnterSpecificMbmsSa" type="mcvideoloc:tMbmsSaIdentity" minOccurs="0"/>
    <xs:element name="ExitSpecificMbmsSa" type="mcvideoloc:tMbmsSaIdentity" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>
<xs:simpleType name="tMbmsSaIdentityFormat">
  <xs:restriction base="xs:integer">
    <xs:minInclusive value="0"/>
    <xs:maxInclusive value="65535"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="tMbmsSaIdentity">
  <xs:simpleContent>
    <xs:extension base="mcvideoloc:tMbmsSaIdentityFormat">
      <xs:attribute name="TriggerId" type="xs:string" use="required"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="tMbsfnAreaChangeType">
  <xs:sequence>
    <xs:element name="EnterSpecificMbsfnArea" type="mcvideoloc:tMbsfnAreaIdentity"
minOccurs="0"/>
    <xs:element name="ExitSpecificMbsfnArea" type="mcvideoloc:tMbsfnAreaIdentity"
minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>
<xs:simpleType name="tMbsfnAreaIdentityFormat">
  <xs:restriction base="xs:integer">
    <xs:minInclusive value="0"/>
    <xs:maxInclusive value="255"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="tMbsfnAreaIdentity">
  <xs:simpleContent>
    <xs:extension base="mcvideoloc:tMbsfnAreaIdentityFormat">
      <xs:attribute name="TriggerId" type="xs:string" use="required"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

```

```

<xs:complexType name="tIntegerAttributeType">
  <xs:simpleContent>
    <xs:extension base="xs:integer">
      <xs:attribute name="TriggerId" type="xs:string" use="required"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="tTravelledDistanceType">
  <xs:sequence>
    <xs:element name="TravelledDistance" type="xs:positiveInteger"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>
<xs:complexType name="tSignallingEventType">
  <xs:sequence>
    <xs:element name="InitialLogOn" type="mcvideoloc:tEmptyTypeAttribute" minOccurs="0"/>
    <xs:element name="GroupCallNonEmergency" type="mcvideoloc:tEmptyTypeAttribute"
minOccurs="0"/>
    <xs:element name="PrivateCallNonEmergency" type="mcvideoloc:tEmptyTypeAttribute"
minOccurs="0"/>
    <xs:element name="LocationConfigurationReceived" type="mcvideoloc:tEmptyTypeAttribute"
minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>
<xs:complexType name="tEmergencyEventType">
  <xs:sequence>
    <xs:element name="GroupCallEmergency" type="mcvideoloc:tEmptyTypeAttribute"
minOccurs="0"/>
    <xs:element name="GroupCallImminentPeril" type="mcvideoloc:tEmptyTypeAttribute"
minOccurs="0"/>
    <xs:element name="PrivateCallEmergency" type="mcvideoloc:tEmptyTypeAttribute"
minOccurs="0"/>
    <xs:element name="InitiateEmergencyAlert" type="mcvideoloc:tEmptyTypeAttribute"
minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>
<xs:complexType name="tRequestedLocationType">
  <xs:sequence>
    <xs:element name="ServingEcgi" type="mcvideoloc:tEmptyType" minOccurs="0"/>
    <xs:element name="NeighbouringEcgi" type="mcvideoloc:tEmptyType" minOccurs="0"
maxOccurs="unbounded"/>
    <xs:element name="MbsmSaId" type="mcvideoloc:tEmptyType" minOccurs="0"/>
    <xs:element name="MbsfnArea" type="mcvideoloc:tEmptyType" minOccurs="0"/>
    <xs:element name="GeographicalCoordinate" type="mcvideoloc:tEmptyType" minOccurs="0"/>
    <xs:element name="minimumIntervalLength" type="xs:positiveInteger"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>
<xs:complexType name="tCurrentLocationType">
  <xs:sequence>
    <xs:element name="CurrentServingEcgi" type="mcvideoloc:tLocationType" minOccurs="0"/>
    <xs:element name="NeighbouringEcgi" type="mcvideoloc:tLocationType" minOccurs="0"
maxOccurs="unbounded"/>
    <xs:element name="MbsmSaId" type="mcvideoloc:tLocationType" minOccurs="0"/>
    <xs:element name="MbsfnArea" type="mcvideoloc:tLocationType" minOccurs="0"/>
    <xs:element name="CurrentCoordinate" type="mcvideoloc:tPointCoordinate" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc: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="tLocationType">
  <xs:choice minOccurs="1" maxOccurs="1">
    <xs:element name="Ecgi" type="mcvideoloc:tEcgi" minOccurs="0"/>
    <xs:element name="SaId" type="mcvideoloc:tMbsmSaIdentity" minOccurs="0"/>
    <xs:element name="MbsfnAreaId" type="mcvideoloc:tMbsfnAreaIdentity" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax"/>
    <xs:element name="anyExt" type="mcvideoinfo:anyExtType" minOccurs="0"/>
  </xs:choice>
  <xs:attribute name="type" type="protectionType"/>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>

<xs:complexType name="tGeographicalAreaChange">
  <xs:sequence>
    <xs:element name="AnyAreaChange" type="mcvideoloc:tEmptyTypeAttribute" minOccurs="0"/>
    <xs:element name="EnterSpecificAreaType" type="mcvideoloc:tSpecificAreaType"
minOccurs="0"/>
    <xs:element name="ExitSpecificAreaType" type="mcvideoloc:tSpecificAreaType"
minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>

<xs:complexType name="tSpecificAreaType">
  <xs:sequence>
    <xs:element name="GeographicalArea" type="mcvideoloc:tGeographicalAreaDef"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="TriggerId" type="xs:string" use="required"/>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>

<xs:complexType name="tPointCoordinate">
  <xs:sequence>
    <xs:element name="longitude" type="mcvideoloc:tCoordinate"/>
    <xs:element name="latitude" type="mcvideoloc:tCoordinate"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>

<xs:complexType name="tCoordinateType">
  <xs:choice minOccurs="1" maxOccurs="1">
    <xs:element name="threebytes" type="mcvideoloc:tThreeByteType" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax"/>
    <xs:element name="anyExt" type="mcvideoinfo:anyExtType" minOccurs="0"/>
  </xs:choice>
  <xs:attribute name="type" type="protectionType"/>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>

<xs:simpleType name="tThreeByteType">
  <xs:restriction base="xs:integer">
    <xs:minInclusive value="0"/>
    <xs:maxInclusive value="16777215"/>
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="tGeographicalAreaDef">
  <xs:sequence>
    <xs:element name="PolygonArea" type="mcvideoloc:tPolygonAreaType" minOccurs="0"/>
    <xs:element name="EllipsoidArcArea" type="mcvideoloc:tEllipsoidArcType" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>

<xs:complexType name="tPolygonAreaType">
  <xs:sequence>
    <xs:element name="Corner" type="mcvideoloc:tPointCoordinate" minOccurs="3"
maxOccurs="15"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0"/>
  </xs:sequence>

```

```

    <xs:anyAttribute namespace="##any" processContents="lax" />
  </xs:complexType>
  <xs:complexType name="tEllipsoidArcType">
    <xs:sequence>
      <xs:element name="Center" type="mcvideoloc:tPointCoordinate" />
      <xs:element name="Radius" type="xs:nonNegativeInteger" />
      <xs:element name="OffsetAngle" type="xs:unsignedByte" />
      <xs:element name="IncludedAngle" type="xs:unsignedByte" />
      <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
      <xs:element name="anyExt" type="mcvideoloc:anyExtType" minOccurs="0" />
    </xs:sequence>
    <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>
</xs:schema>

```

F.3.3 Semantic

The <location-info> element is the root element of the XML document. The <location-info> element contains the <Configuration>, <Request> and <Report> subelements, of which only one can be present.

<Configuration> element has a <ConfigScope> attribute that can assume the values "Full" and "Update". The value "Full" means that the <Configuration> element contains the full location configuration which replaces any previous location configuration. The value "Update" means that the location configuration is in addition to any previous location configuration. To remove configuration elements a "Full" configuration is needed. The <Configuration> element contains the following child elements:

- 1) <NonEmergencyLocationInformation>, an optional element that specifies the location information requested in non-emergency situations. The <NonEmergencyLocationInformation> has the subelements:
 - a) <ServingEcgi>, an optional element specifying that the serving E-UTRAN Cell Global Identity (ECGI) needs to be reported;
 - b) <NeighbouringEcgi>, an optional element that can occur multiple times, specifying that neighbouring ECGIs need to be reported;
 - c) <MbmsSaId>, an optional element specifying that the serving MBMS Service Area Id needs to be reported;
 - d) <MbsfnArea>, an optional element specifying that the MBSFN area Id needs to be reported;
 - e) <GeographicalCoordinate>, an optional element specifying that the geographical coordinate specified in subclause 6.1 in 3GPP TS 23.032 [39] needs to be reported; and
 - f) <minimumIntervalLength>, a mandatory element specifying the minimum time the MCVideo client needs to wait between sending location reports. The value is given in seconds;
- 2) <EmergencyLocationInformation>, an optional element that specifies the location information requested in emergency situations. The <EmergencyLocationInformation> has the subelements:
 - a) <ServingEcgi>, an optional element specifying that the serving ECGI needs to be reported;
 - b) <NeighbouringEcgi>, an optional element that can occur multiple times, specifying that neighbouring ECGIs need to be reported;
 - c) <MbmsSaId>, an optional element specifying that the serving MBMS Service Area Id needs to be reported;
 - d) <MbsfnArea>, an optional element specifying that the MBSFN area Id needs to be reported;
 - e) <GeographicalCoordinate>, an optional element specifying that the geographical coordinate specified in subclause 6.1 in 3GPP TS 23.032 [39] needs to be reported; and
 - f) <minimumIntervalLength>, a mandatory element specifying the minimum time the MCVideo client needs to wait between sending location reports. The value is given in seconds; and

- 3) <TriggeringCriteria>, a mandatory element specifying the triggers for the MCVideo client to perform reporting. The <TriggeringCriteria> element contains the following sub-elements:
- a) <CellChange>, an optional element specifying what cell changes trigger location reporting. Consists of the following sub-elements:
 - I) <AnyCellChange>, an optional element. The presence of this element specifies that any cell change is a trigger. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
 - II) <EnterSpecificCell>, an optional element specifying an ECGI which when entered triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string; and
 - III) <ExitSpecificCell>, an optional element specifying an ECGI which when exited triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
 - b) <TrackingAreaChange>, an optional element specifying what tracking area changes trigger location reporting. Consists of the following sub-elements:
 - I) <AnyTrackingAreaChange>, an optional element. The presence of this element specifies that any tracking area change is a trigger. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
 - II) <EnterSpecificTrackingArea>, an optional element specifying a Tracking Area Id which when entered triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string; and
 - III) <ExitSpecificTrackingArea>, an optional element specifying a Tracking Area Id which when exited triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
 - c) <PlmnChange>, an optional element specifying what PLMN changes trigger location reporting. Consists of the following sub-elements:
 - I) <AnyPlmnChange>, an optional element. The presence of this element specifies that any PLMN change is a trigger. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
 - II) <EnterSpecificPlmn>, an optional element specifying a PLMN Id which when entered triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string; and
 - III) <ExitSpecificPlmn>, an optional element specifying a PLMN Id which when exited triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
 - d) <MbmsSaChange>, an optional element specifying what MBMS changes trigger location reporting. Consists of the following sub-elements:
 - I) <AnyMbmsSaChange>, an optional element. The presence of this element specifies that any MBMS SA change is a trigger. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
 - II) <EnterSpecificMbmsSa>, an optional element specifying an MBMS Service Area Id which when entered triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string; and
 - III) <ExitSpecificMbmsSa>, an optional element specifying an MBMS Service Area Id which when exited triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
 - e) <MbsfnAreaChange>, an optional element specifying what MBSFN changes trigger location reporting. Consists of the following sub-elements:
 - I) <AnyMbsfnAreaChange>, an optional element. The presence of this element specifies that any MBSFN area change is a trigger. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
 - II) <EnterSpecificMbsfnArea>, an optional element specifying an MBSFN area which when entered triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string; and
 - III) <ExitSpecificMbsfnArea>, an optional element specifying an MBSFN area which when exited triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;

- f) <PeriodicReport>, an optional element specifying that periodic location reports shall be sent. The value in seconds specifies the reporting interval. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
- g) <TravelledDistance>, an optional element specifying that the travelled distance shall trigger a report. The value in metres specifies the travelled distance. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
- h) <McvideoSignallingEvent>, an optional element specifying what signalling events triggers a location report. The <McvideoSignallingEvent> element has the following sub-elements:
 - I) <InitialLogOn>, an optional element specifying that an initial log on triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
 - II) <GroupCallNonEmergency>, an optional element specifying that a non-emergency group call triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
 - III) <PrivateCallNonEmergency>, an optional element specifying that a non-emergency private call triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string; and
 - IV) <LocationConfigurationReceived>, an optional element specifying that a received location configuration triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string; and
- i) <GeographicalAreaChange>, an optional element specifying what geographical area changes trigger location reporting. Consists of the following sub-elements:
 - I) <AnyAreaChange>, an optional element. The presence of this element specifies that any geographical area change is a trigger. Contains a mandatory <TriggerId> attribute that shall be set to a unique string;
 - II) <EnterSpecificArea>, an optional element specifying a geographical area which when entered triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string. The <EnterSpecificArea> element has the following sub-elements:
 - A) <GeographicalArea>, an optional element containing a <TriggerId> attribute and the following two subelements:
 - x1) <PolygonArea>, an optional element specifying the area as a polygon specified in subclause 5.2 in 3GPP TS 23.032 [39]; and
 - x2) <EllipsoidArcArea>, an optional element specifying the area as an Ellipsoid Arc specified in subclause 5.7 in 3GPP TS 23.032 [39]; and
 - III) <ExitSpecificAreaType>, an optional element specifying a geographical area which when exited triggers a location report. Contains a mandatory <TriggerId> attribute that shall be set to a unique string.

<Request> is an element with a <RequestId> attribute. The <Request> element is used to request a location report. The value of the <RequestId> attribute is returned in the corresponding <ReportId> attribute in order to correlate the request and the report.

<Report> is an element used to include the location report. It contains a <ReportId> attribute and a <ReportType> attribute. The <ReportId> attribute is used to return the value in the <RequestId> attribute in the <Request> element. The <ReportType> attribute has two values "Emergency" and "NonEmergency" used to inform whether the client is sending the report in an emergency situation or not. The <Report> element contains the following sub-elements:

- 1) <TriggerId>, an optional element which can occur multiple times that contain the value of the <TriggerId> attribute associated with a trigger that has fired; and
- 2) <CurrentLocation>, a mandatory element that contains the location information. The <CurrentLocation> element contains the following sub-elements:
 - a) <CurrentServingEcgi>, an optional element containing the ECGI of the serving cell;
 - b) <NeighbouringEcgi>, an optional element that can occur multiple times. It contains the ECGI of any neighbouring cell the MCVideo client can detect;

- c) <MbmsSaId>, an optional element containing the MBMS Service Area Id the MCVideo client is using;
- d) <MbsfnArea>, an optional element containing the MBSFN area the MCVideo is located in; and
- e) <CurrentCoordinate>, an optional element containing the longitude and latitude coded as in subclause 6.1 in 3GPP TS 23.032 [39].

The contents of the subelements in the <CurrentLocation> subelement of the <Report> element can be encrypted. The following rules are applied when any of these elements are included:

- 1) if confidentiality protection is not required, then:
 - a) the "type" attributes associated with the <CurrentServingEcgi>, <NeighbouringEcgi>, <MbmsSaId>, and <MbsfnArea> elements of the <Report> element have the value "Normal" and
 - ii) the <Ecgi> subelement of the <CurrentServingEcgi> element contains the unencrypted value of the ECGI of the serving cell;
 - iii) the <Ecgi> subelement of the <NeighbouringEcgi> element contains the unencrypted value of the ECGI of any neighbouring cell;
 - iv) the <SaId> subelement of the <MbmsSaId> element contains the unencrypted value of the MBMS Service Area Id the MCVideo client is using; and
 - v) the <MbsfnAreaId> subelement of the <MbsfnArea>, element contains the unencrypted value of the MBSFN area the MCVideo is located in;
 - b) the "type" attributes associated with the <longitude> and <latitude> subelements of the <CurrentCoordinate> element have the value "Normal" and the <three-bytes> subelements of <longitude> and <latitude> subelements contain the unencrypted value of longitude and latitude.
- 2) if confidentiality protection is required, then:
 - a) the "type" attributes associated with the <CurrentServingEcgi>, <NeighbouringEcgi>, <MbmsSaId>, and <MbsfnArea> elements have the value "Encrypted";
 - b) the "type" attributes associated with the <longitude> and <latitude> subelements of the <CurrentCoordinate> element have the value "Encrypted";
 - c) for each of the elements described in 2a) and subelements described in 2b) above, the <xenc:EncryptedData> element from the "<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: 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.

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

F.3.4 IANA registration template

Editor's note: The application/vnd.3gpp.mcvideo-location-info+xml MIME type as defined in this subclause needs to be registered at completion of Release-14.

Your Name:

<MCC name>

Your Email Address:

<MCC email address>

Media Type Name:

Application

Subtype name:

vnd.3gpp.mcvideo-location-info+xml

Required parameters:

None

Optional parameters:

"charset" the parameter has identical semantics to the charset parameter of the "application/xml" media type as specified in section 9.1 of IETF RFC 7303.

Encoding considerations:

binary.

Security considerations:

Same as general security considerations for application/xml media type as specified in section 9.1 of IETF RFC 7303. In addition, this media type provides a format for exchanging information in SIP, so the security considerations from IETF RFC 3261 apply.

The information transported in this media type does not include active or executable content.

Mechanisms for privacy and integrity protection of protocol parameters exist. Those mechanisms as well as authentication and further security mechanisms are described in 3GPP TS 24.229.

This media type does not include provisions for directives that institute actions on a recipient's files or other resources.

This media type does not include provisions for directives that institute actions that, while not directly harmful to the recipient, may result in disclosure of information that either facilitates a subsequent attack or else violates a recipient's privacy in any way.

This media type does not employ compression.

Interoperability considerations:

Same as general interoperability considerations for application/xml media type as specified in section 9.1 of IETF RFC 7303. Any unknown XML elements and any unknown XML attributes are to be ignored by recipient of the MIME body.

Published specification:

3GPP TS 24.281 "Mission Critical Video (MCVideo) signalling control; Protocol specification" version 14.0.0, available via <http://www.3gpp.org/specs/numbering.htm>.

Applications which use this media type:

Applications supporting the mission critical video as described in the published specification.

Fragment identifier considerations:

The handling in section 5 of IETF RFC 7303 applies.

Restrictions on usage:

None

Provisional registration? (standards tree only):

N/A

Additional information:

1. Deprecated alias names for this type: none
2. Magic number(s): none
3. File extension(s): none
4. Macintosh File Type Code(s): none
5. Object Identifier(s) or OID(s): none

Intended usage:

Common

Person to contact for further information:

- Name: <MCC name>
- Email: <MCC email address>
- Author/Change controller:
 - i) Author: 3GPP CT1 Working Group/3GPP_TSG_CT_WG1@LIST.ETSI.ORG
 - ii) Change controller: <MCC name>/<MCC email address>

F.4 XML schema for MCVideo (de)-affiliation requests

F.4.1 General

This subclause defines XML schema and MIME type for MCVideo (de)-affiliation requests.

F.4.2 XML schema

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="urn:3gpp:ns:affiliationCommand:1.0"
xmlns:mcvideoaff="urn:3gpp:ns:affiliationCommand:1.0"
attributeFormDefault="unqualified" elementFormDefault="qualified">
  <xs:complexType name="affiliate-command" id="affil">
    <xs:sequence>
      <xs:element type="xs:anyURI" name="group" minOccurs="1" maxOccurs="unbounded"/>
      <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element name="anyExt" type="mcvideoaff:anyExtType" minOccurs="0"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax"/>
  </xs:complexType>
  <xs:complexType name="de-affiliate-command">
    <xs:sequence>
      <xs:element type="xs:anyURI" name="group" minOccurs="1" maxOccurs="unbounded"/>
      <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element name="anyExt" type="mcvideoaff:anyExtType" minOccurs="0"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax"/>
  </xs:complexType>
  <xs:element name="command-list">
    <xs:complexType>
      <xs:sequence>
```

```

    <xs:element name="affiliate" type="mcvideoaff:affiliate-command" minOccurs="0"
maxOccurs="1"/>
    <xs:element name="de-affiliate" type="mcvideoaff:de-affiliate-command" minOccurs="0"
maxOccurs="1"/>
    <xs:element name="anyExt" type="mcvideoaff:anyExtType" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
</xs:element>
<xs:complexType name="anyExtType">
  <xs:sequence>
    <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
</xs:schema>

```

F.4.3 Semantic

The <command-list> element is the root element of the XML document. The <command-list> element may contain <affiliate-command>, or <de-affiliate-command> subelements or both.

If the <command-list> contains the <affiliate-command> element then:

- 1) the <affiliate-command> element contains a list of <group> subelements having at least one subelement. The recipient shall perform an affiliation for all the MCVideo groups contained in the list for the clients for which the <command-list> applies.

If the <command-list> contains the <de-affiliate-command> element then:

- 1) the <de-affiliate-command> element contains a list of <group> subelements having at least one subelement. The recipient shall perform a de-affiliation for all the MCVideo groups contained in the list for the clients for which the <command-list> applies.

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

F.4.4 IANA registration template

Editor's note: The MIME type `application/vnd.3gpp.mcvideo-affiliation-command+xml` as defined in this subclause needs to be registered in the IANA registry for Application Media Types based upon the template which will be added here.

Annex G (informative): On-network emergency and imminent peril related states

G.1 MCVideo emergency state

The MCVideo emergency state is managed by the MCVideo client and MCVideo user. High-level characteristics of this state are captured in table G-1.1.

Table G.1-1: MCVideo emergency state

MCVideo emergency state	State-setting events	State-clearing events	Comments
Values: "set": MCVideo user is in a life-threatening situation "clear": MCVideo user is not in a life-threatening situation Managed by: MCVideo client and MCVideo user	MCVideo emergency alert initiated MCVideo emergency group call initiated MCVideo emergency private call initiated	MCVideo emergency alert cancelled (by initiator) MCVideo emergency alert cancelled (by authorised-user) MCVideo emergency call cancelled by initiator (if there is no outstanding MCVideo emergency alert) MCVideo user manually clears the state	While the MCVideo client is in the MCVideo emergency state, all group calls it makes will be MCVideo emergency group calls, providing the group is authorised for MCVideo emergency group calls. While in an emergency group call while in the MCVideo emergency state, the MCVideo user is an "emergency talker" and will have pre-emptive priority over non-emergency talkers in the emergency group call.

G.2 In-progress emergency group state

This state is described in both 3GPP TS 22.281 [36] and 3GPP TS 23.281 [26]. It is managed by the controlling MCVideo function. High-level characteristics of this state are captured in table G.2-1.

Table G.2-1: in-progress emergency group state

In-progress emergency group state values	State-entering events	Comments
"true"	acceptance by the controlling MCVideo function of an MCVideo emergency group call request (as per subclause 7.1.2.5.1.1 of 3GPP TS 23.281 [26]).	
"false"	initial state prior to any call activity acceptance by the controlling MCVideo function of an MCVideo emergency group cancel request (as per subclause 7.1.2.5.1.3 of 3GPP TS 23.281 [26]).	

G.3 MCVideo emergency group state

The MCVideo emergency group state is the MCVideo client's perspective of the in-progress emergency group state which is managed by the controlling MCVideo function. The MCVideo emergency group (MVEG) state is managed by the MCVideo client to enable the requesting of MCVideo emergency-level priority as early as possible in the origination of an MCVideo emergency group call. High-level characteristics of this state are captured in table G.3-1.

Table G.3-1: MCVideo emergency group state

MCVideo emergency group state values	State-entering events	Comments
MVEG 1: no-emergency	<p>initial state prior to any call activity</p> <p>Emergency group call cancel request received on behalf of another user from the MCVideo server</p> <p>Emergency group call cancel response (success) in response to initiator's request</p>	
MVEG 2: in-progress	<p>Emergency group call response received (confirm) to initiator's emergency group call request</p> <p>Emergency group call request received (on behalf of another user)</p>	In this state, all participants in calls on this group will receive emergency level priority whether or not they are in the MCVideo emergency state themselves.
MVEG 3: cancel-pending	Emergency group call cancel request sent by initiator	The controlling MCVideo server may not grant the cancel request for various reasons, e.g., other users in an MCVideo emergency state remain in the call.
MVEG 4: confirm-pending	Emergency group call request sent by initiator	The controlling MCVideo server may not grant the call request for various reasons, e.g., the MCVideo group is not configured as being emergency-capable so it can't be assumed that the group will enter the in-progress state.

G.4 MCVideo emergency group call state

Table G.4-1 provides the semantics of the MCVideo emergency group call (MVEGC) state values. This internal state of the MCVideo client and is managed by the MCVideo client. These states aid in the managing of the information elements of MCVideo emergency group calls and MCVideo emergency alerts and their cancellations.

Table G.4-1: MCVideo emergency group call state

MCVideo emergency group call state values	Semantics	Comments
MVEGC 1: emergency-gc-capable	MCVideo client emergency-capable client is not currently in an MCVideo emergency group call that it has originated, nor is it in the process of initiating one.	MCVideo emergency state: may or may not be set in this state, depending upon the MCVideo client's MVEA state
MVEGC 2: emergency-call-requested	MCVideo client has initiated an MCVideo emergency group call request.	MCVideo emergency state: is set
MVEGC 3: emergency-call-granted	MCVideo client has received an MCVideo emergency group call grant.	If the MCVideo user initiates a call while the MCVideo emergency state is still set, that call will be an MCVideo emergency group call, assuming that group is authorised for the client to initiate emergency group calls on. MCVideo emergency state: is set

G.5 MCVideo emergency alert state

Table G.5-1 provides the semantics of the MCVideo emergency alert (MVEA) state values. This is an internal state of the MCVideo client and is managed by the MCVideo client. These states aid in the managing of the information elements of MCVideo emergency group calls and MCVideo emergency alerts and their cancellations.

Table G.5-1: MCVideo emergency alert state

MCVideo emergency alert state values	State-entering events	Comments
MVEA 1: no-alert	initial state emergency alert cancelled emergency alert request denied	emergency alerts can be cancelled in several ways: MCVideo emergency alert cancel request with <alert-ind> set to "false" (by initiator) MCVideo emergency alert cancel request with <alert-ind> set to "false" (by authorised user) MCVideo emergency group call cancel request with <alert-ind> set to "false" MCVideo emergency state: may be set or clear, depending on MCVideo emergency call status
MVEA 2: emergency-alert-confirm-pending	emergency alert request sent	emergency alerts can be requested in several ways: MCVideo emergency alert request with <alert-ind> set to "true" MCVideo emergency group call request with <alert-ind> set to "true" MCVideo emergency state: is set
MVEA 3: emergency-alert-initiated	emergency alert response (success) received	MCVideo emergency state: is set
MVEA 4: emergency-alert-cancel-pending	emergency alert cancellation request sent by alert originator	MCVideo emergency state: is clear

G.6 In-progress imminent peril group state

This state is described in both 3GPP TS 22.281 [36] and 3GPP TS 23.281 [26]. It is managed by the controlling MCVideo function. High-level characteristics of this state are captured in table G.6-1.

Table G.6-1: in-progress imminent peril group state

In-progress imminent peril group state values	State-entering events	Comments
"true"	acceptance by the controlling MCVideo function of an MCVideo imminent peril group call request (as per subclause 7.1.2.5.2.1 and subclause 7.1.2.5.2.2 of 3GPP TS 23.281 [26]).	
"false"	initial state prior to any call activity acceptance by the controlling MCVideo function of an MCVideo imminent peril group cancel request (as per subclause 7.1.2.5.2.3 of 3GPP TS 23.281 [26]).	

G.7 MCVideo imminent peril group state

The MCVideo imminent peril group state is the MCVideo client's perspective of the in-progress imminent peril group state which is managed by the controlling MCVideo function. The MCVideo imminent peril group (MVIG) state is managed by the MCVideo client to enable the requesting of MCVideo imminent peril-level priority as early as possible in the origination of an MCVideo imminent peril group call. High-level characteristics of this state are captured in table G.7-1.

Table G.7-1: MCVideo imminent peril group state

MCVideo imminent peril group state values	State-entering events	Comments
MVIG 1: no-imminent peril	<p>initial state prior to any call activity</p> <p>Imminent peril group call cancel request received on behalf of another user from the MCVideo server</p> <p>Imminent peril group call cancel response (success) in response to initiator's request</p>	
MVIG 2: in-progress	<p>Imminent peril group call response received (confirm) to initiator's imminent peril group call request</p> <p>Imminent peril group call request received (on behalf of another user)</p>	In this state, all participants in calls on this group will receive imminent peril level priority whether or not they initiated an MCVideo imminent peril group call themselves.
MVIG 3: cancel-pending	Imminent peril group call cancel request sent by initiator	The controlling MCVideo server may not grant the cancel request for various reasons, e.g., other users in an MCVideo imminent peril state remain in the call.
MVIG 4: confirm-pending	Imminent peril group call request sent by initiator	The controlling MCVideo server may not grant the call request for various reasons, e.g., the MCVideo group is not configured as being imminent peril-capable so it can't be assumed that the group will enter the in-progress state.

G.8 MCVideo imminent peril group call state

Table G.8-1 provides the semantics of the MCVideo imminent peril group call (MVIGC) state values. This internal state of the MCVideo client and is managed by the MCVideo client. These states aid in the managing of the information elements of MCVideo imminent peril group calls and their cancellations.

Table G.8-1: MCVideo imminent peril group call state

MCVideo imminent peril group call state values	Semantics	Comments
MVIGC 1: imminent peril-gc-capable	MCVideo client imminent peril-capable client is not currently in an MCVideo imminent peril group call that it has originated, nor is it in the process of initiating one.	In this state, the MCVideo imminent peril group state will be set to either "MVIG 1: no-imminent-peril" or "MVIG 2 in-progress" state.
MVIGC 2: imminent peril-call-requested	MCVideo client has initiated an MCVideo imminent peril group call request.	In this state, the MCVideo imminent peril group state will be set to "MVIG 4: confirm-pending" if not already in the "MVIG 2 in-progress" state.
MVIGC 3: imminent peril-call-granted	MCVideo client has received an MCVideo imminent peril group call grant.	In this state, the MCVideo imminent peril group state will be set to "MVIG 2 in-progress".

Annex H (informative): On-network routing considerations

H.1 General

The following subclauses summarise the identities placed into SIP headers and SIP bodies during session establishment.

H.2 Group Call

Table H.2-1 describes the contents of the SIP headers and SIP bodies inserted by MCVideo clients and MCVideo servers involved in a group call.

Table H.2-1: Routing considerations for group call

Interface	Content of SIP headers	Content of "mcvideo-info" MIME body	Notes
originating MCVideo client to originating participating MCVideo function (O-PF).	Request-URI contains PSI of O-PF. P-Preferred-Identity may contain IMPU of originating user.	"mcvideo-request-uri" contains the group identity.	PSI of O-PF configured for each client. MCVideo-id of each client is never sent in session initiation.
O-PF to controlling MCVideo function (CF).	Request-URI contains PSI of CF. P-Asserted-Identity contains IMPU of originating user.	"mcvideo-request-uri" contains the group identity. "mcvideo-calling-user-id" contains MCVideo ID of originating user.	CF finds the MCVideo ID of the originating user from the stored IMPU-MCVideo ID binding and locates the PSI of the controller that serves the group identity. O-PF contains configuration of the PSIs of the CFs.
CF to terminating participating MCVideo function (T-PF).	Request-URI contains the address of the T-PF. P-Asserted-Identity contains the address of the CF.	"mcvideo-request-uri" contains the MCVideo ID of the terminating user. "mcvideo-calling-user-id" contains MCVideo ID of originating user. "mcvideo-calling-group-id" contains the group identity.	For each client in the group, CF maps the MCVideo-ID of the terminator to the address of the T-PF. If the terminator is in another domain, the CF can map the MCVideo ID of the terminator to a PSI identifying a interrogating function in the partner network that is able to find the T-PF using the MCVideo ID.
CF to non-controlling MCVideo function of an MCVideo group (NCF).	Request-URI contains the PSI of the NCF. P-Asserted-Identity contains the PSI of the CF.	"mcvideo-request-uri" contains the group identity. "mcvideo-calling-user-id" contains MCVideo ID of originating user.	-
T-PF to terminating MCVideo client.	Request-URI contains the IMPU of the terminating user. P-Asserted-Identity contains the address of the CF.	"mcvideo-request-uri" contains the MCVideo ID of the terminating user. "mcvideo-calling-user-id" contains MCVideo ID of originating user. "mcvideo-calling-group-id" contains the group identity.	T-PF finds the IMPU of the terminating user from the stored IMPU-MCVideo ID binding at the time of registration.
terminating MCVideo client to T-PF (response).	as in TS 24.229.	"mcvideo-called-party-id" contains contacted client's MCVideo ID.	-
T-PF to NCF (response)	as in TS 24.229	"mcvideo-called-party-id" contains contacted client's MCVideo ID.	-
T-PF to CF (response).	as in TS 24.229.	"mcvideo-called-user" contains contacted client's MCVideo ID.	-
NCF to CF (response)	as in TS 24.229.	-	In the case of trusted mutual aid, the NCF returns the identities of the group in a "resource-lists" MIME body.
CF to O-PF (response)	as in TS 24.229.	-	-
O-PF to originating MCVideo client (response)	as in TS 24.229.	-	-

Annex I (informative): Change history

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2017-01						Initial version.	0.0.0
2017-01						Implementing the following agreed P-CRs after CT1#101bis: C1-170280	0.1.0
2017-03						Implementing the following agreed P-CRs after CT1#102: C1-170816, C1-170817, C1-170818, C1-170819, C1-170820, C1-170821, C1-171047, C1-171049, C1-171050, C1-171053, C1-171054, C1-171120, C1-171121, C1-171122, C1-171124.	0.2.0
2017-04						Implementing the following agreed P-CRs after CT1#103: C1-171453, C1-171458, C1-171459, C1-171460, C1-171723, C1-171724, C1-171813.	0.3.0
2017-05						Implementing the following agreed P-CRs after CT1#104: C1-172055, C1-172333, C1-172336, C1-172520, C1-172522, C1-172523, C1-172526, C1-172528, C1-172754	0.4.0
2017-06	CT-76	CP-171108				Version 1.0.0 created for presentation for information at CT76	1.0.0
2017-06	CT-76					Version 14.0.0 created after approval at CT76	14.0.0

History

Document history		
V14.0.0	July 2017	Publication