**3GPP TSG-CT WG1 Meeting #133-eC1-21xxxx**

**Electronic meeting, 11-19 November 2021 (was C1-216648)**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.281** | **CR** | **0143** | **rev** | **1** | **Current version:** | **14.11.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Non-controlling MCVideo function | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | FirstNet | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | MCImp-MCVIDEO-CT | | | | |  | ***Date:*** | | | 11 November 2021 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-14 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17)  Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The signalling procedures (clause 6.3.4 and subclauses) for the non-controlling MCVideo function are missing. References to these procedures are stubbed off with references to "clause x.x.x" in the remainder of TS 24.281. | | | | | | | | |
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| ***Summary of change:*** | | The non-controlling MCVideo function signaling procedures for clause 6.3.4 and its subclauses are provided. Stubbed off references to those procedures are corrected with the proper references. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The signalling procedures for the non-controlling MCVideo function will be missing from TS 24.281. This will make it impossible for MCVideo to support regroup operations. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | (all new) 6.3.4, 6.3.4.1, 6.3.4.1.1, 6.3.4.1.2, 6.3.4.1.3, 6.3.4.1.4, 6.3.4.1, 6.3.4.2.1, 6.3.4.2.2, 6.3.4.2.2.1, 6.3.4.2.2.2, 6.3.4.3,  (existing subclauses) 9.2.1.5, 9.2.1.5.1, 9.2.5.2.2, 9.2.1.5.2.3, 9.2.1.5.5, 9.2.2.5, 9.2.2.5.1.2, 9.2.2.5.1.3, 9.2.2.5.1.8, I.1  (all new) I.1.1, I.1.2, I.1.2.1, I.1.2.2, I.1.2.3, I.1.2.4, I.1.2.5, I.1.2.6, I.1.2.7, I.1.2.8, I.1.2.9, I.1.2.10, I.1.2.11 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev 1:   * Updated clause I.1 and added subclauses (adapted directly from TS 24.379) to define the g.3gpp.mcvideo-transmission-request INFO package * Updated clause 6.3.4.2.1 based on TS 24.379 clause 6.3.4.2.1. * Corrected the name of the MIME body in clause 6.3.4.1.3 step 3. * Removed step a) under step 3) and renumbered the steps. * In clause 6.3.4.2.2.2, added steps 5 and 10 and renumbered the other steps. * In clause 9.2.1.5.2.2, reworded the EN slightly for readability. * In clause 9.2.1.5.2.3 under receipt of the SIP ACK request, corrected the wording to "non-"controlling MCVideo function and corrected the name of the entity to "transmitting MCVideo client" in step 1. | | | | | | | | |

**\* \* \* \* \* FIRST CHANGE \* \* \* \* \***

### 6.3.4 Non-controlling MCVideo function of an MCVideo group

#### 6.3.4.1 Request initiated by the non-controlling MCVideo function of an MCVideo group

##### 6.3.4.1.1 SDP offer generation

The SDP offer is generated based on the received SDP offer. The SDP offer generated by the non-controlling MCVideo function of an MCVideo group:

1) shall include only one SDP media-level section for MCVideo video media stream according to 3GPP TS 24.229 [11], as contained in the received SDP offer;

2) shall include only one SDP media-level section for MCVideo audio media stream according to 3GPP TS 24.229 [11], as contained in the received SDP offer; and

3) shall contain one SDP media-level section for a media transmission control entity according to 3GPP TS 24.229 [11], if present in the received SDP offer.

When composing the SDP offer according to 3GPP TS 24.229 [4], the non-controlling MCVideo function of an MCVideo group:

1) shall replace the IP address and port number for the offered audio media stream in the "m=audio" media-level section with an IP address and port number of the non-controlling MCVideo function;

2) for the MCVideo audio media stream, shall include all media-level attributes from the received SDP offer;

3) shall replace the IP address and port number for the offered video media stream in the "m=video" media-level section with an IP address and port number of the non-controlling MCVideo function;

4) for the MCVideo video media stream, shall include all media-level attributes from the received SDP offer;

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

6) shall include the offered media transmission control entity 'fmtp' attributes as specified in 3GPP TS 24.581 [5].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

##### 6.3.4.1.2 Sending an INVITE request towards the MCVideo client

This subclause is referenced from other procedures.

The non-controlling MCVideo function of an MCVideo group shall generate initial SIP INVITE requests according to 3GPP TS 24.229 [11].

For each SIP INVITE request, the non-controlling MCVideo function of an MCVideo group:

1) shall generate a new MCVideo session identity for the MCVideo session with the invited MCVideo client and include it in the Contact header field together with the g.3gpp.mcvideo media feature tag, the g.3gpp.icsi-ref media feature tag with the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo", and the isfocus media feature tag according to IETF RFC 3840 [22];

2) 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];

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-Id header field according to IETF RFC 6050 [14] in the SIP INVITE request;

4) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref with the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo" along with parameters "require" and "explicit" according to IETF RFC 3841 [20];

5) shall set the Request-URI to the public service identity of the terminating participating MCVideo function associated to the MCVideo ID of the MCVideo user to be invited;

NOTE 1: How the non-controlling MCVideo function finds the address of the terminating participating MCVideo 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.

6) shall copy the application/vnd.3gpp.mcvideo-info+xml MIME body in the received SIP INVITE request to the outgoing SIP INVITE request;

7) shall update the application/vnd.3gpp.mcvideo-info+xml MIME body with: an <mcvideo-request-uri> element set to the MCVideo ID of the invited MCVideo user;

8) shall include the public service identity of the non-controlling MCVideo function in the P-Asserted-Identity header field;

9) shall include the received Referred-By header field with the public user identity of the inviting MCVideo client;

10) should include the Session-Expires header field according to rules and procedures of IETF RFC 4028 [23]. The refresher parameter shall be omitted;

11) shall include the Supported header field set to "timer";

12) shall include an unmodified Answer-Mode header field, if present in the incoming SIP INVITE request; and

13) shall include the warning text set to "148 group is regrouped" in a Warning header field as specified in clause 4.4.

NOTE 3: As long as the MCVideo group is regrouped the transmission control messages in the media plane include a grouped regrouped indication as specified in 3GPP TS 24.581 [5].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

##### 6.3.4.1.3 Sending a SIP INFO request

This clause is referenced from other procedures.

The non-controlling MCVideo function shall generate a SIP INFO request according to rules and procedures of 3GPP TS 24.229 [11] and IETF RFC 6086 [54].

The non-controlling MCVideo function:

1) shall include the Info-Package header field set to "g.3gpp.mcvideo-transmission-request";

2) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideo-request-uri> set to the temporary MCVideo group ID and the <mcvideo-calling-group-id> element with the constituent MCVideo group ID;

3) shall include an application/vnd.3gpp.mcvideo-transmission-request+xml MIME body with the Content-Disposition header field set to "Info-Package". For each currently transmitting MCVideo client the application/vnd.3gpp.mcvideo-transmission-request+xml MIME body shall be populated as follows:

a) the SSRC of the MCVideo client with the permission to send media in the <ssrc> element;

b) the actual transmission priority in the <transmission-priority> element;

c) the MCVideo ID of the MCVideo user with the permission to send media in the <user-id> element;

d) the queueing capability in the <queueing-capability> element of the <track-info> element;

e) the participant type in the <participant-type> in the <track-info> element;

f) one or more <transmission-participant-reference> elements in the <track-info> element in the same order as the would appear in the Track Info field as specified in 3GPP TS 24.581 [5] clause 9.2.3.13; and

g) if available, additional information in the <transmission-indicator> element.

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

##### 6.3.4.1.4 Sending an INVITE request towards the controlling MCVideo function

This clause is referenced from other procedures.

The non-controlling MCVideo function shall generate a SIP INVITE request according to rules and procedures of 3GPP TS 24.229 [11].

The non-controlling MCVideo function:

1) shall include in the Contact header field the g.3gpp.mcvideo media feature tag, the g.3gpp.icsi-ref media feature tag with the value of "urn:urn-7:3gpp-service.ims.icsi.mcvideo", and the isfocus media feature tag according to IETF RFC 3840 [22];

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-Asserted-Service-Id header field according to IETF RFC 6050 [14] in the SIP INVITE request;

3) shall set the Request-URI to the public service identity of the controlling MCVideo function based on the <mcvideo-request-uri> element received in the "SIP INVITE request for controlling MCVideo function of an MCVideo group";

NOTE 1: How the non-controlling MCVideo function finds the address of the controlling MCVideo 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.

4) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body with:

a) the <session-type> element set to "prearranged";

NOTE 3: The <session-type> element is set to "prearranged" regardless of which type of group the constituent MCVideo group is.

b) the <mcvideo-request-uri> element set to the TGI retrieved from the <on-network-regrouped> element in the group document;

c) the <MCVideo-calling-user-id> element set to the constituent MCVideo group ID; and

d the <required> element set to "true", if the group document retrieved from the group management server contains <on-network-required> group members as specified in 3GPP TS 24.481 [24];

5) shall include the public service identity of the non-controlling MCVideo function in the P-Asserted-Identity header field;

6) should include the Session-Expires header field according to rules and procedures of IETF RFC 4028 [23]. The refresher parameter shall be omitted; and

7) shall include the Supported header field set to "timer".

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

#### 6.3.4.2 Requests terminated by the non-controlling MCVideo function of an MCVideo group

##### 6.3.4.2.1 SDP answer generation

When composing the SDP answer according to 3GPP TS 24.229 [4], the non-controlling MCVideo function of an MCVideo group:

1) for the accepted audio media stream in the received SDP offer:

a) shall replace the IP address and port number in the received SDP offer with the IP address and port number of the non-controlling MCVideo function;

2) for the accepted video media stream in the received SDP offer:

a) shall replace the IP address and port number in the received SDP offer with the IP address and port number of the non-controlling MCVideo function; and

3) for the accepted media transmission control entity, if present in the received SDP offer:

a) shall replace the IP address and port number in the received SDP offer with the IP address and port number of the non-controlling MCVideo function; and

b) shall include 'fmtp' attributes as specified in 3GPP TS 24.581 [5].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

##### 6.3.4.2.2 Sending a SIP response to the SIP INVITE request

###### 6.3.4.2.2.1 Sending a SIP 183 (Session Progress) response

When sending a SIP 183 (Session Progress) the non-controlling MCVideo function of an MCVideo group:

1) shall generate a SIP 183 (Session Progress) response according to 3GPP TS 24.229 [11];

2) 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";

3) shall include the public service identity of the non-controlling MCVideo function in the P-Asserted-Identity header field; and

4) shall include the option tag "tdialog" in a Supported header field according to rules and procedures of IETF RFC 4538 [32];

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

###### 6.3.4.2.2.2 Sending a SIP 200 (OK) response

When sending a SIP 200 (OK) response, the non-controlling MCVideo function of an MCVideo group:

1) shall generate the SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [11];

2) shall include the Session-Expires header field and start supervising the SIP session according to rules and procedures of IETF RFC 4028 [23], "UAS Behavior". The "refresher" parameter in the Session-Expires header field shall be set to "uac";

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

4) shall include the public service identity of the non-controlling MCVideo function in the P-Asserted-Identity header field;

5) shall include a SIP URI for the MCVideo session identity in the Contact header field identifying the MCVideo session at the non-controlling MCVideo function;

6) 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";

7) shall include Warning header field(s) received in incoming responses to the SIP INVITE request;

8) shall include the option tag "tdialog" in a Supported header field according to rules and procedures of IETF RFC 4538 [32];

9) shall include an application/vnd.3gpp.mcvideo-info+xml MIME body with the <mcvideo-called-party-id> element set to the constituent MCVideo group ID and the <transmission-state> element set to the state of the transmission; and

10) shall interact with the media plane as specified in 3GPP TS 24.581 [5].**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

#### 6.3.4.3 Generating a SIP NOTIFY request

The non-controlling MCVideo function shall generate a SIP NOTIFY request according to 3GPP TS 24.229 [11] with the clarification in this clause.

In the SIP NOTIFY request, the non-controlling MCVideo function:

1) shall set the P-Asserted-Identity header field to the public service identity of the non-controlling MCVideo function;

2) shall include an Event header field set to "conference";

3) shall include an Expires header field set to 3600 seconds according to IETF RFC 4575 [57], as default value;

4) 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]; and

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

a) the <mcvideo-calling-group-id> set to the value of the constituent MCVideo group ID;

b) if the target is an MCVideo user, the value of <mcvideo-request-uri> element set to the MCVideo ID of the targeted MCVideo user; and

c) if the target is the controlling MCVideo function the value of <mcvideo-request-uri> element set to the temporary MCVideo group ID.

In the SIP NOTIFY request, the non-controlling MCVideo function shall include application/conference-info+xml MIME body according to IETF RFC 4575 [57] as specified in clause 6.3.3.4 with the following exceptions:

1) the non-controlling MCVideo function shall not regard the controlling MCVideo function as a participant and not include the controlling MCVideo function in a <user> element; and

NOTE: The controlling MCVideo function initiated the temporary group call and will appear as a participant in the group session.

2) the non-controlling MCVideo function shall include stored conference status information received in SIP NOTIFY requests from the controlling MCVideo function in clause 9.2.3.5.3 and status information about own participants.

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

#### 9.2.1.5 Non-controlling function of an MCVideo group procedures

##### 9.2.1.5.1 Originating procedures

This clause 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 clause 9.2.1.5.2 or clause 9.2.1.5.5.

The non-controlling MCVideo function:

1) shall invite the MCVideo clients as specified in clause 6.3.4.1.2;

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 clause 6.3.4.1.1; 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 clause 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 inititated by the receipt of the "SIP INVITE request for non-controlling MCVideo function of an MCVideo group" as specified in clause 9.2.1.5.2, shall cache the SIP 3xx, 4xx, 5xx or 6xx response.

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

###### 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 clause 4.4, and shall not process the remaining steps;

Editor's Note: [CT1#133-e, C1-21xxxx, CR 0143 rev 1] Step 5 is absent on purpose. In 3GPP TS 24.379 clause 10.1.1.5.2.2, that this procedure is a copy of, step 5 deals with "a trusted mutual aid relationship … between the partner MCPTT system and the primary MCPTT system" and references 3GPP TS 23.379 clause 10.6.2.4.2. There is no equivalent clause in 3GPP TS 23.281. If 3GPP TS 23.281were to include an equivalent clause, this EN can be removed and replaced by a step 5 equivalent to that of 3GPP TS 24.379.

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 clause 6.3.5.2 and continue with the rest of the steps if the checks in clause 6.3.5.2 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 clause 6.3.5.5;

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 clause 6.3.4.2.2.1 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 clause 6.3.4.2.2.1;

12) shall invite each group member determined in step 9) above, to the group session, as specified in clause 9.2.1.5.1; and

13) shall interact with the media plane as specified in 3GPP TS 24.581 [5] clause 6.3;

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 clause 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 clause 6.3.4.2.2.1; 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 clause 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 clause 6.3.4.2.2.2 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 clause 6.3.4.2.1;

3) shall interact with the media plane as specified in 3GPP TS 24.581 [5] clause 6.3.5; 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 [24], then upon receiving the first SIP 200 (OK) response to a SIP INVITE request sent to an invited MCVideo client as specified in clause 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 clause 6.3.4.2.2.2 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 clause 6.3.4.2.1;

3) shall interact with the media plane as specified in 3GPP TS 24.581 [5] clause 6.3.5; 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].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

###### 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 merge 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 clause 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 clause 6.3.4.2.2.2 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 clause 6.3.4.2.1;

NOTE 2: Resulting media plane processing is completed before the next step is performed.

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 clause 9.2.3.5.3.

Upon receipt of the SIP ACK request, the non-controlling MCVideo function of an MCVideo group:

1) if information about a currently transmitting MCVideo client is cached:

a) shall generate a SIP INFO request as specified in clause 6.3.4.1.3; 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] clause 6.3.5.3; and

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 clause 9.2.3.5.3.

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

##### 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 clause 6.3.5.2 and continue with the rest of the steps if the checks in clause 6.3.5.2 succeed;

NOTE 2: If the checks are not succesful, the SIP response to the "SIP INVITE request "SIP INVITE request for controlling MCVideo function of an MCVideo group" is already sent in the clause 6.3.5.2.

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 clause 6.3.5.4, if the MCVideo user is unauthorized to initiated 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 clause 4.4.

8) shall generate a SIP INVITE request to the controlling MCVideo function as specified in clause 6.3.4.1.4; 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 clause 6.3.4.2.1 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 clause 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] clause 6.5;

4) shall determine the members to invite to the prearranged MCVideo group call as specified in clause 6.3.5.2; and

5) shall invite each group member determined in step 2) above, to the group session, as specified in clause 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 clause 9.2.1.4 and invite members as specified in clause 6.3.4.1.2.

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].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

#### 9.2.2.5 Non-controlling function of an MCVideo group procedures

###### 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 clause 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 clause 6.3.4.2.2.2 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 clause 6.3.4.2.1;

8) shall interact with the media plane as specified in 3GPP TS 24.581 [5] clause 6.3.5; 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].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

###### 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 clause 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 clause 6.3.4.2.2.2 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 clause 6.3.4.2.1;

8) shall instruct the media plane to initialise the switch to the non-controlling mode as specified in 3GPP TS 24.581 [5] clause 6.5.2.3;

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 clause 6.3.4.1.3; 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] clause 6.3.5.3; and

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 clause 9.2.3.5.3.

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

###### 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 clause 6.3.5.2 and continue with the rest of the steps if the checks in clause 6.3.5.2 succeed;

NOTE 2: If the checks are not succesful, the SIP response to the "SIP INVITE request "SIP INVITE request for controlling MCVideo function of an MCVideo group" is already sent in the clause 6.3.5.2.

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 clause 6.3.5.2, 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 clause 4.4.

8) shall generate a SIP INVITE request to the controlling MCVideo function as specified in clause 6.3.4.1.4; 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 clause 6.3.4.2.1 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 clause 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] clause 6.5.

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 clause 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.

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

Annex I (informative):  
INFO packages defined in the present document

# I.1 Info package for transfer of transmission participants requests

Editor’s note: [CT1#133-e, C1-21xxxx, CR0143 rev 1]: The info package type "application/vnd.3gpp.mcvideo-transmission-request+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 at the completion of 3GPP release 17.

## I.1.1 Scope

This clause contains the information required for the IANA registration of info package g.3gpp.mcvideo-transmission-request in accordance with IETF RFC 6086 [21].

## I.1.2 g.3gpp.mcvideo-transmission-request info package

### I.1.2.1 Overall description

When a temporary group call includes constituent MCVideo groups in partner systems where an MCVideo call is ongoing and if there is a participant with permission to transmit, the non-controlling MCVideo function of an MCVideo group needs to transfer information of the currently transmitting user(s) to the controlling MCVideo function hosting the temporary group. The information is transferred in the form of a transmission request.The controlling MCVideo function will then determine if the participant will be permitted to continue to transmit or if the permission to transmit is revoked.

### I.1.2.2 Applicability

This package is used to transport a transmission request from the non-controlling MCVideo function of an MCVideo group to the controlling MCVideo function hosting the temporary group.

I.1.2.3 Appropriateness of INFO Package Usage

A number of solutions were discussed for the transportation of the transmission request to the controlling MCVideo function hosting the temporary MCVideo group. The solutions were:

1) Use of the session related methods (e.g. SIP 200 (OK) response to the SIP INVITE request).

2) Use of the SIP MESSAGE method.

3) Use of the SIP INFO method as described in IETF RFC 6086 [21], by defining a new info package.

The result of the evaluation of the above solutions were:

1) To include such a large amount of data in a SIP 200 (OK) response to an SIP INVITE request could cause problems with the size of the SIP 200 (OK) response resulting in packet fragmentation.

2) The use of the SIP MESSAGE request would result in that the recommended value of size of the information transferred by the SIP MESSAGE request would be exceeded.

3) The use of SIP INFO request was found as the most appropriate solution since the SIP INFO request could be sent in the existing SIP session.

### I.1.2.4 Info package name

g.3gpp.mcvideo-transmission-request

### I.1.2.5 Info package parameters

None defined

### I.1.2.6 SIP options tags

None defined

### I.1.2.7 INFO message body parts

The MIME type of the message body carrying participant identities is application/vnd.3gpp.mvideo-transmission-request+xml. The application/vnd.3gpp.mcvideo-transmission-request+xml MIME type is defined in 3GPP TS 24.281.

When associated with the g.3gpp.mcvideo-transmission-request info package, the Content-Disposition value of the message body carrying the floor request is "info-package".

### I.1.2.8 Info package usage restrictions

None defined.

### I.1.2.9 Rate of INFO Requests

Single INFO request generated after session set up.

### I.1.2.10 Info package security considerations

The security is based on the generic security mechanism provided for the underlying SIP signalling. No additional security mechanism is defined.

### I.1.2.11 Implementation details and examples

UAC generation of INFO requests: See 3GPP TS 24.281: "Mission Critical Video (MCVideo) signalling control; Protocol specification".

UAS processing of INFO requests: See 3GPP TS 24.281: "Mission Critical Video (MCVideo) signalling control; Protocol specification".

EXAMPLE: A controlling MCVideo function hosting a temporary MCVideo group inviting a constituent MCVideo group hosted by a non-controlling MCVideo function of an MCVideo group in a partner system where an MCVideo call is ongoing with one or two of the participants granted to transmit. Then the non-controlling MCVideo function of the constituent MCVideo group sends a SIP INFO request carrying a transmission request in an application/vnd.3gpp.mcvideo-transmission-request+xml MIME body using the g.3gpp.mcvideo-transmission-request info package.

**\* \* \* \* \* END CHANGES \* \* \* \* \***