**3GPP TSG-CT WG1 Meeting #122-eC1-200787**

**Electronic meeting, 20-28 February 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.182** | **CR** | **0114** | **rev** | **2** | **Current version:** | **16.1.0** |  |
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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:*** | Use precondition only for CAT when network disables precondition | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, China Telecom, China Unicom, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eIMSVideo | | | | |  | ***Date:*** | | | 2020-02-17 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Precondition mechanism is important for providing video CAT service. Because more resources are nceeded to play video CAT, if precondition is not used, clipping of video CAT media will be more obvious than audio CAT. To ensure video CAT user’s experience, precondition is recommended by some operators to be used for video CAT.  As per GSMA IR.65/92, the network may disable precondition mechanism by removing the "precondition" option-tag and other precondition related SDP lines from the SIP request/response. If so, the AS do not know whether the network support precondition for CAT.  One simple method for the AS is to use precondtion based on local configuration. This method need to be considered in TS24.182. | | | | | | | | |
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| ***Summary of change:*** | | Support using precondition for CAT when preconditions is local configured as allowed. | | | | | | | | |
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| ***Consequences if not approved:*** | | Without local configuration, the AS cannot know precondition mechanism is allowed for CAT when network disables precondition. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 4.5.5.2.6, 4.5.5.3.7 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

\*\*\*\*\* Next change \*\*\*\*\*

# 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] 3GPP TS 22.182: "Customized Alerting Tones (CAT) Requirements; Stage 1".

[3] 3GPP TS 24.238: "Session Initiation Protocol (SIP) based user configuration; Stage 3".

[4] 3GPP TS 24.229: "Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[5] RFC 3262: "Reliability of Provisional Responses in the Session Initiation Protocol (SIP)".

[6] 3GPP TS 24.623: "Extensible Markup Language (XML) Configuration Access Protocol (XCAP) over the Ut interface for Manipulating Supplementary Services".

[7] RFC 3959: "The Early Session Disposition Type for the Session Initiation Protocol (SIP)".

[8] RFC 3960: "Early Media and Ringing Tone Generation in the Session Initiation Protocol (SIP)".

[9] RFC 5009 (September 2007): "Private Header (P-Header) Extension to the Session Initiation Protocol (SIP) for Authorization of Early Media".

[10] 3GPP TS 24.607: "Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[11] RFC 6086 (January 2011): "Session Initiation Protocol (SIP) INFO Method and Package Framework".

[12] RFC 4796 (February 2007): "The Session Description Protocol (SDP) Content Attribute".

[13] RFC 3311: "The Session Initiation Protocol (SIP) UPDATE Method".

[14] 3GPP TS 24.628: "Common Basic Communication procedures; Protocol specification".

[15] RFC 4566: "SDP: Session Description Protocol".

[xx] RFC 3312: "Integration of Resource Management and Session Initiation Protocol (SIP)"

\*\*\*\*\* Next change \*\*\*\*\*

##### 4.5.5.2.6 AS Actions for Gateway model

The AS performing the Gateway model shall follow the procedure as specified in RFC 3960 [8] and annex G in 3GPP TS 24.628 [14] with the additional procedures described in this subclause.

Upon receiving an initial INVITE request, before forwarding the initial INVITE request towards the terminating UE, the AS shall:

a) store the SDP offer sent from the originating side if the AS is going to update media with both originating side and terminating side when the 200 (OK) response to the initial INIVTE request is received;

b) if required by local policy, remove the P-Early-Media header field, if present; and

c) contact the MRF to request CAT resource.

When the video media feature tag is not included in the Contact header field of the initial INVITE request towards the terminating UE and there is no video description in the SDP offer included in the initial INVITE request, the AS shall not request video CAT resource from MRF, and shall not apply video CAT media to the originating UE.

Editor’s note: [TEI15, CR0096] the mechanism and procedure to support the selection of the media type of early media by end users is FFS.

NOTE: If playing customized media before alerting is allowed based on operator's policy, upon forwarding the initial INVITE request to the terminating UE, the AS can play customized media before alerting by following the procedure as specified in annex G in 3GPP TS 24.628 [14]. When to stop the customized media depends on operator's policy.

Upon receiving an SIP 180 (Ringing) response or SIP 183 (Session Progress) response to the initial SIP INVITE request sent to the terminating UE, before forwarding the response towards the originating UE, the AS shall:

a) if the SIP 180 (Ringing) response or the SIP 183 (Session Progress) response to the initial SIP INVITE request includes an SDP answer, store the SDP answer received from the terminating UE;

b) if the AS has not sent an SDP answer:

1) generate an SDP answer, either:

i) based on the SDP answer as received from the terminating UE, if:

- the originating UE requires the use of precondition mechanism and the resources required between the originating UE and the terminating UE are more than the resources required between originating UE and MRF associated with the AS for CAT; or

- the media types required between originating UE and MRF associated with the AS for CAT are different from the media types required between the originating UE and the terminating UE; or

ii) based on the information received from the MRF associated with AS for CAT, for all other cases;

2) include an SDP content media-level attribute, as specified in RFC 4796 [12], with a "g.3gpp.cat" value in the generated SDP answer; and

3) remove the received P-Early-Media header field if present, and include a P-Early-Media header field with a "sendrecv" value or a "sendonly" value; and

c) if the AS has sent an SDP answer, the AS shall not generate an SDP answer.

NOTE: The procedures for handling multiple early dialogs, due to forking, is not specified in the current release of this specification.

When "precondition" option-tag is not included in the value of Supported header field in the received initial INVITE request, if precondition mechanism is allowed to be used based on local configuration, the AS may send an UPDATE request, as specified in RFC 3311 [13] and RFC 3312 [xx], to use precondition mechanism for CAT media. The AS shall include "a=content" media-level attribute with a "g.3gpp.cat" value in the SDP offer of the UPDATE request.

If the originating UE requires the use of precondition mechanism, the AS shall not instruct the MRF to start applicable media for the CAT service before the originating UE has indicated that preconditions are fulfilled. The point when the AS instruct the MRF to start applicable media for the CAT service is based on local policy.

If the originating UE requires the use of precondition mechanism, upon receiving an SIP 200 (OK) response for SIP UPDATE request from terminating UE which corresponds to UPDATE request sent by the originating UE to indicate that resources at the originating UE is available, the AS shall:

a) store the SDP of the terminating UE; and

b) forward the SDP of the terminating UE to the originating UE.

If the originating UE requires the use of precondition mechanism, upon receiving an SIP 180 (Ringing) response for SIP INVITE request from terminating UE used to indicate that resources are available on the terminating UE and user is being alerted, the AS shall forward the SDP of the CAT to the originating UE in an UPDATE request as specified in RFC 3311 [13]; the media types required in the SDP of the CAT can be different from the media types required in the SDP offer initiated by originating UE in previous INVITE request.

When the media types required in the SDP of the CAT and the previous SDP offer in INVITE request are different, if the originating UE requires the use of precondition mechanism, the AS shall not instruct the MRF to start applicable media for the CAT service before the originating UE has indicated that preconditions are fulfilled in the 200 (OK) response to the UPDATE request or consequent UPDATE request. The point when the AS instructs the MRF to start applicable media for the CAT service is based on local policy.

When the media types required in the SDP of the CAT and the previous SDP offer in INVITE request are different, and if the originating UE does not require the use of precondition mechanism, the AS shall forward the SDP of the CAT to the originating UE in UPDATE request as specified in RFC 3311 [13].

If UPDATE request containing an SDP offer from terminating side is received when a 180 (Ringing) response has been sent and a 200 (OK) response to the initial INVITE has not been sent yet, the AS shall:

a) not forward the UPDATE request to the originating side;

b) store the SDP offer contained in the UPDATE request, and if SDP answer or SDP offer from terminating side has been stored previously, the AS shall replace it with the new received SDP offer; and

c) respond to the UPDATE request with a 200 (OK) response and generate an SDP answer based on the SDP offer previously sent from the originating side.

Upon receiving an SIP 200 (OK) (INVITE) from terminating UE, if it is not allowed to continue playing video CAT by operator or user settings, or if video CAT media has not been played during the called party alerting, the AS shall instruct the MRF to stop the media for the CAT service and either:

a) if the AS is going to update media only with the originating side, generate an UPDATE request as specified in RFC 3311 [13] to update the media with the originating UE using either:

1) if the AS has previously stored the SDP answer or SDP offer sent from the terminating side, the SDP answer of the terminating UE as previously stored; or

2) if the AS has not previously stored SDP answer or SDP offer sent from the terminating side, the SDP answer received in the immediate 200 (OK) response to the SIP INVITE request; or

b) if the AS is going to update media with both originating side and terminating side:

1) send an offerless re-INVITE request to the terminating side;

2) upon receiving a SIP response to the re-INVITE request containing an SDP offer from the terminating side, generate an UPDATE request as specified in RFC 3311 [13] to send an SDP offer to the originating UE. The SDP offer shall only contain the media components which appeared both in the SDP offer contained in the SIP response to the re-INVITE request and the previously stored SDP offer in the initial INVITE, and set the port number of the corresponding m-line to zero if it has been set to zero during previous SDP negotiation; and

3) upon receiving a 200 (OK) response to the UPDATE request from the originating side, generate an SDP answer to the terminating side, included in the ACK request associated with the re-INVITE request. The SDP answer shall be based on the SDP answer contained in the 200 (OK) response to the UPDATE request, and for the media components which not appear in the SDP answer in the 200 (OK) response, set the port number of the corresponding m-line to zero.

If video CAT has been played during the called party alerting, and if it is allowed to continue playing video CAT by operator and user settings during converstion, upon receiving an SIP 200 (OK) (INVITE) from terminating UE, the AS shall perform either above bullet a) or bullet b) in the paragraph above related to the reception of 200 (OK) on INVITE with additions described below:

a) before using the SDP answer received from terminating UE to update media with originating UE by UPDATE request, the AS shall:

1) if the SDP answer only includes audio components, which means the conversation is going to be audio conversation, insert video components into this SDP answer based on the CAT information previously received from MRF, the video components shall include:

i) a media-level attribute "c=", as specified in RFC 4566 [15], with a value of the corresponding IP address for CAT media;

ii) a media-level attribute with a "g.3gpp.cat" value; and

iii) an "a=sendonly" attribute.

2) if the SDP answer includes video components but with zero port number or with an "a=inactive" attribute, which also means the conversation is going to be audio conversation, replace the existed video components with new video components based on the CAT information previously received from MRF, the new video media components shall include:

i) a media-level attribute "c=", as specified in RFC 4566 [15], with a value of the corresponding IP address for CAT media;

ii) a media-level attribute with a "g.3gpp.cat" value; and

iii) an "a=sendonly" attribute.

3) if the SDP answer includes video descriptions with port number greater than zero and without an "a=inactive" attribute, instruct the MRF to stop to play CAT media.

b) upon receiving a 200 (OK) response associated with the UPDATE request mentioned in the first sentence of bullet a) from the originating side:

1) if the AS is going to forward the SDP answer contained in this 200 (OK) response to terminating UE, before forwarding the SDP answer to the terminating UE, the AS shall exclude CAT related media descriptions from the SDP answer; and

2) if the SDP answer in this 200 (OK) response includes the video components of video CAT, after the media update in bullet a) in the paragraph above related to continue playing video CAT is finished, the AS shall instruct the MRF to stop the audio stream of video CAT.

\*\*\*\*\* Next change \*\*\*\*\*

##### 4.5.5.3.7 AS Actions for Gateway model

The AS performing the Gateway model shall follow the procedure as specified in RFC 3960 [8] and annex G in 3GPP TS 24.628 [14] with the additional procedures described in this subclause.

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a) if the SIP 180 (Ringing) response or the SIP 183 (Session Progress) response to the initial SIP INVITE request includes an SDP answer, store the SDP answer received from the terminating UE;

b) if the AS has not sent an SDP answer:

1) generate an SDP answer, either:

i) based on the SDP answer as received from the terminating UE, if:

- the originating UE requires the use of precondition mechanism and the resources required between the originating UE and the terminating UE are more than the resources required between originating UE and MRF associated with the AS for CAT; or

- the media types required between originating UE and MRF associated with the AS for CAT are different from the media types required between the originating UE and the terminating UE; or

ii) based on the information received from the MRF associated with AS for CAT, for all other cases;

2) include an SDP content media-level attribute, as specified in RFC 4796 [12], with a "g.3gpp.cat" value in the generated SDP answer; and

3) remove the received P-Early-Media header field if present, and include a P-Early-Media header field with a "sendrecv" value or a "sendonly" value; and

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If the originating UE requires the use of precondition mechanism, the AS shall not instruct the MRF to start applicable media for the CAT service before the originating UE has indicated that preconditions are fulfilled. The point when the AS instruct the MRF to start applicable media for the CAT service is based on local policy.

If the originating UE requires the use of precondition mechanism, upon receiving an SIP 200 (OK) response for SIP UPDATE request from terminating UE which corresponds to UPDATE request sent by the originating UE to indicate that resources at the originating UE is available, the AS shall:

a) store the SDP of the terminating UE; and

b) forward the SDP of the terminating UE to the originating UE.

If the originating UE requires the use of precondition mechanism, upon receiving an SIP 180 (Ringing) response for SIP INVITE request from terminating UE used to indicate that resources are available on the terminating UE and user is being alerted, the AS shall forward the SDP of the CAT to the originating UE in UPDATE request as specified in RFC 3311 [13]; the media types required in the SDP of the CAT can be different from the media types required in the SDP offer initiated by originating UE in previous INVITE request.

When the media types required in the SDP of the CAT and the previous SDP offer in INVITE request are different, if the originating UE requires the use of precondition mechanism, the AS shall not instruct the MRF to start applicable media for the CAT service before the originating UE has indicated that preconditions are fulfilled in the 200 (OK) response to the UPDATE request or consequent UPDATE request. The point when the AS instructs the MRF to start applicable media for the CAT service is based on local policy.

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If UPDATE request containing an SDP offer from terminating side is received when a 180 (Ringing) response has been sent and a 200 (OK) response to the initial INVITE has not been sent yet, the AS shall:

a) not forward the UPDATE request to the originating side; and

b) store the SDP offer contained in the UPDATE request, and if SDP answer or SDP offer from terminating side has been stored previously, the AS shall replace it with the new received SDP offer; and

c) respond to the UPDATE request with a 200 (OK) response and generate an SDP answer based on the SDP offer previously sent from the originating side.

Upon receiving an SIP 200 (OK) (INVITE) from terminating UE, if it is not allowed to continue playing video CAT by operator or user settings, or if video CAT media has not been played during the called party alerting, the AS shall instruct the MRF to stop the media for the CAT service and either:

a) if the AS is going to update media only with the originating side, generate an UPDATE request as specified in RFC 3311 [13] to update the media with the originating UE using either:

1) if the AS has previously stored the SDP answer or SDP offer sent from the terminating side, the SDP answer of the terminating UE as previously stored; or

2) if the AS has not previously stored SDP answer or SDP offer sent from the terminating side, the SDP answer received in the immediate 200 (OK) response to the SIP INVITE request.or

b) if the AS is going to update media with both originating side and terminating side:

1) send an offerless re-INVITE request to the terminating side;

2) upon receiving a SIP response to the re-INVITE request containing an SDP offer from the terminating side, generate an UPDATE request as specified in RFC 3311 [13] to send an SDP offer to the originating UE. The SDP offer shall only contain the media components which appeared both in the SDP offer contained in the SIP response to the re-INVITE request and the previously stored SDP offer in the initial INVITE, and set the port number of the corresponding m-line to zero if it has been set to zero during previous SDP negotiation; and

3) upon receiving a 200 (OK) response to the UPDATE request from the originating side, generate an SDP answer to the terminating side, included in the ACK request associated with the re-INVITE request. The SDP answer shall be based on the SDP answer contained in the 200 (OK) response to the UPDATE request, and for the media components which not appear in the SDP answer in the 200 (OK) response, set the port number of the corresponding m-line to zero.

If video CAT has been played during the called party alerting, and if it is allowed to continue playing video CAT by operator and user settings during converstion, upon receiving an SIP 200 (OK) (INVITE) from terminating UE, the AS shall perform either above bullet a) or bullet b) in the paragraph above related to the reception of 200 (OK) on INVITE with additions described below:

a) before using the SDP answer received from terminating UE to update media with originating UE by UPDATE request, the AS shall:

1) if the SDP answer only includes audio components, which means the conversation is going to be audio conversation, insert video components into this SDP answer based on the CAT information previously received from MRF, the video components shall include:

i) a media-level attribute "c=", as specified in RFC 4566 [15], with a value of the corresponding IP address for CAT media;

ii) a media-level attribute with a "g.3gpp.cat" value; and

iii) an "a=sendonly" attribute.

2) if the SDP answer includes video components but with zero port number or with an "a=inactive" attribute, which also means the conversation is going to be audio conversation, replace the existed video components with new video components based on the CAT information previously received from MRF, the new video media components shall include:

i) a media-level attribute "c=", as specified in RFC 4566 [15], with a value of the corresponding IP address of CAT media;

ii) a media-level attribute with a "g.3gpp.cat" value; and

iii) an "a=sendonly" attribute.

3) if the SDP answer includes video descriptions with port number greater than zero and without an "a=inactive" attribute, which means the conversation is going to be video conversation, instruct the MRF to stop to play CAT media.

b) upon receiving a 200 (OK) response associated with the UPDATE request mentioned in the first sentence of bullet a) from the originating side:

1) if the AS is going to forward the SDP answer contained in this 200 (OK) response to terminating UE, before forwarding the SDP answer to the terminating UE, the AS shall exclude CAT related media descriptions from the SDP answer; and

2) if the SDP answer in this 200 (OK) response includes the video components of video CAT, after the media update in bullet a) in the paragraph above related to continue playing video CAT is finished, the AS shall instruct the MRF to stop the audio stream of video CAT.