Lucent Gateway Platform

FID15068.0 – Support SIP Preconditions Requirements

QDI ID 54615 – Draft

January 10, 2014

April Liu

Table of Contents

1. Introduction

1.1 Purpose and Scope

LGP Feature Number	CPDR Feature Number	Title	Release
15068.0	15068.0	Support SIP Preconditions	R9.3

1.2 Document History

Date	Version	Description / Summary of Changes	Author
07/31/2013	Draft	Initial draft version	April Liu
9/30/2013	Draft	Add 3.2.1.8 requirements of re-route	April Liu
12/20/2013	Draft	Based on comments, add requirements 0160, 0170, 0180, and modify 2050 and 3.2.1.8 re-route	April Liu
1/10/2014	Draft	Modify 3.2.1.8 re-route requirements based on comments	April Liu
2/21/2014	Draft	Add requirement 8070 for interaction with early ACM, requirement 8080 for interaction with CRBT.	April Liu

1.3 Acknowledgments

The author would like to acknowledge all reviewers who provided valuable input and feedback on the contents of this document:
Joe Kott, Katie Zhang, Gary Jin, Rowen Wang, Helen Ji, Karen

2. Feature Overview

2.1 Overview

SIP preconditions typically involves a three-step process to confirm that all preconditions have been met:

1. INVITE from UAC includes SDP offer with current quality of service (qos) and desired or mandatory qos preconditions
2. Reliable 183 Session Progress from UAS includes SDP answer with its view of current and desired qos. SDP answer usually also includes a request that the UAC send a confirmation when all preconditions have been satisfied.
3. UPDATE from UAC includes another SDP offer that confirms that all desired qos preconditions have been satisfied. When the UAS receives this confirmation, it begins alerting and sends a 180 Ringing response toward the caller.

Note that the 183 and subsequent UPDATE exchanged between UAC and UAS confirm that SDP is negotiated between the calling and called parties, but does not mean that alerting has actually started. Further, just because SDP has been negotiated does not mean that alerting tones will be carried in the RTP stream.

RFC 3312 goes to great lengths to define a call processing implementation that uses a “local status table” that keeps track of the status of both the local and remote agents. The MGC-8 is free to implement a design that uses other mechanisms, but the design used by the MGC-8 must support the capabilities defined in RFC 3312.

RFC 3312 describes both end-to-end (e2e) and segmented status types, and the MGC-8 will support only support segmented status type because e2e requires RSVP support but MGC-8 doesn't support this protocol.

2.2 Assumptions and Dependencies

1. This feature supports only precondition-type=qos.
2. This feature supports only segmented status-type=local/remote, doesn't support status-type=e2e.
3. This feature supports preconditions negotiation before answer. The post-answer preconditions will be supported in phase 2.
4. This feature supports preconditions for SIP/SIP-I to SIP/SIP-I and SIP/SIP-I <-> ISUP/ISDN calls. SIP<->BICC preconditions call is not supported, it might be supported in the future depending on customer request.
5. This feature supports receiving SDP in 580/BYE/CANCEL to indicate the reason for preconditions failure but does not support sending SDP in 580/BYE/CANCEL.

2.3 Scenarios and Call Flows

Call flows from ROM:

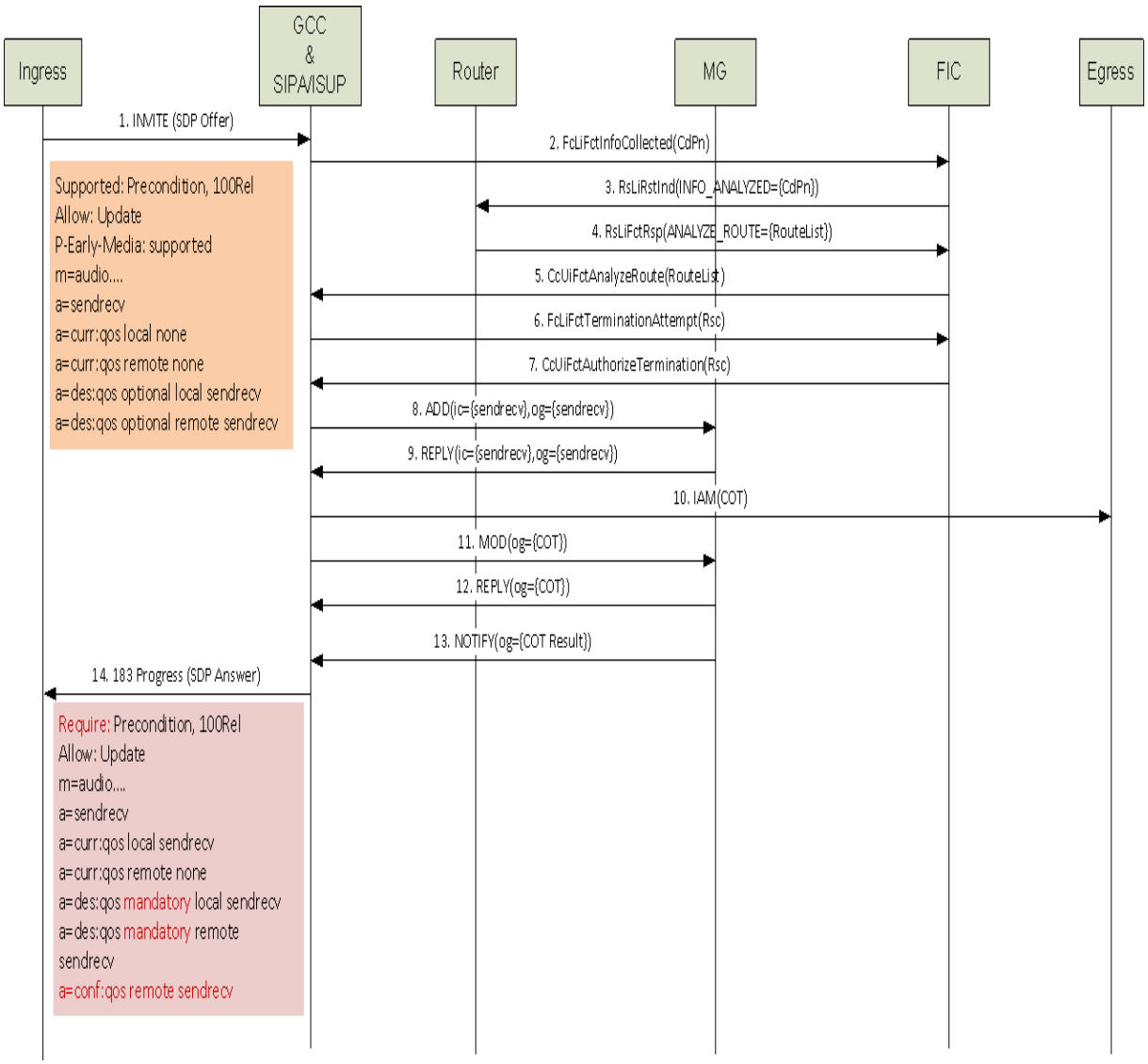

Figure 1: SIP to ISUP call with COT Preconditions – Call Flow 1

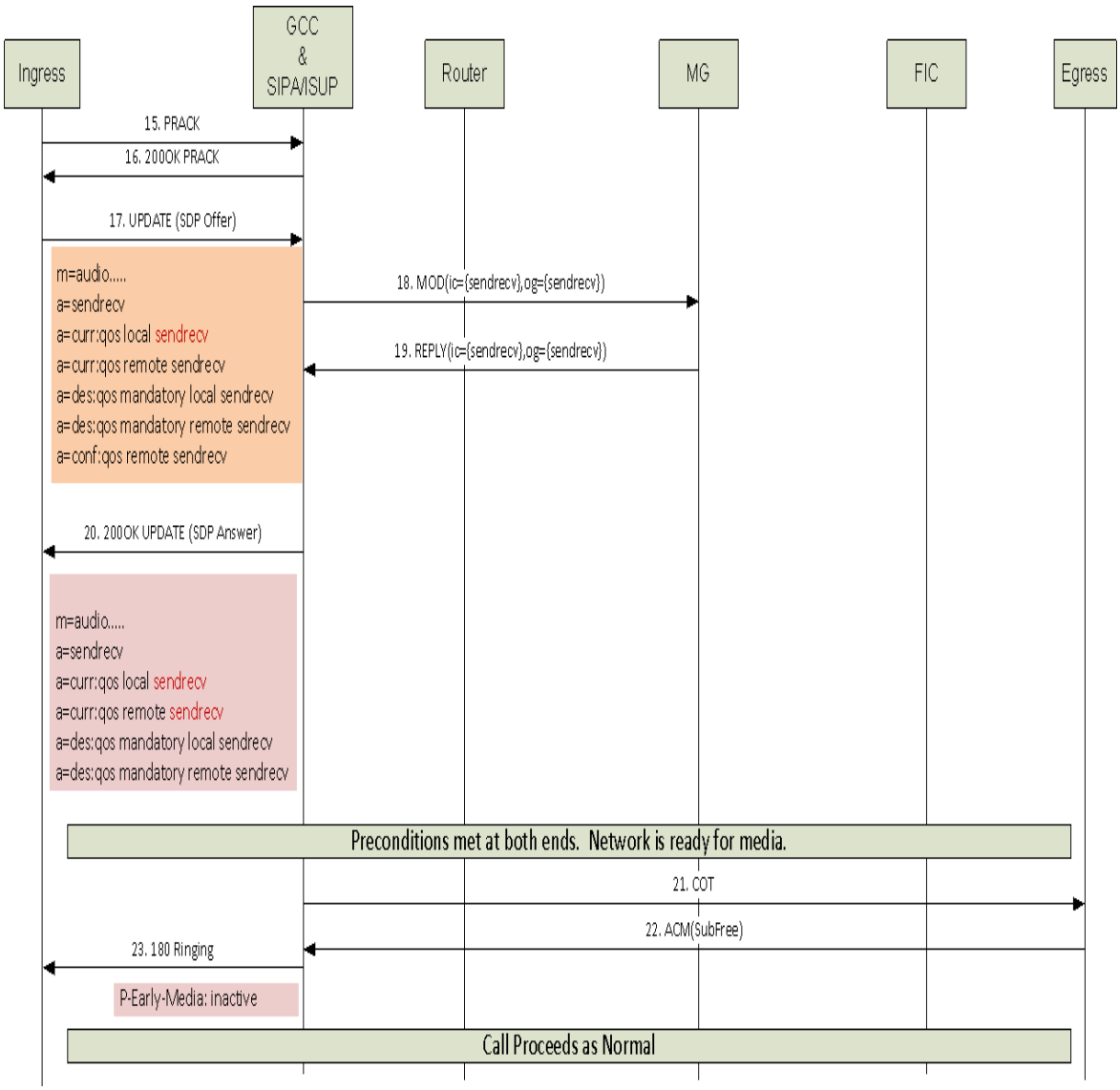

Figure 2: SIP to ISUP call with COT Preconditions – Call Flow 2

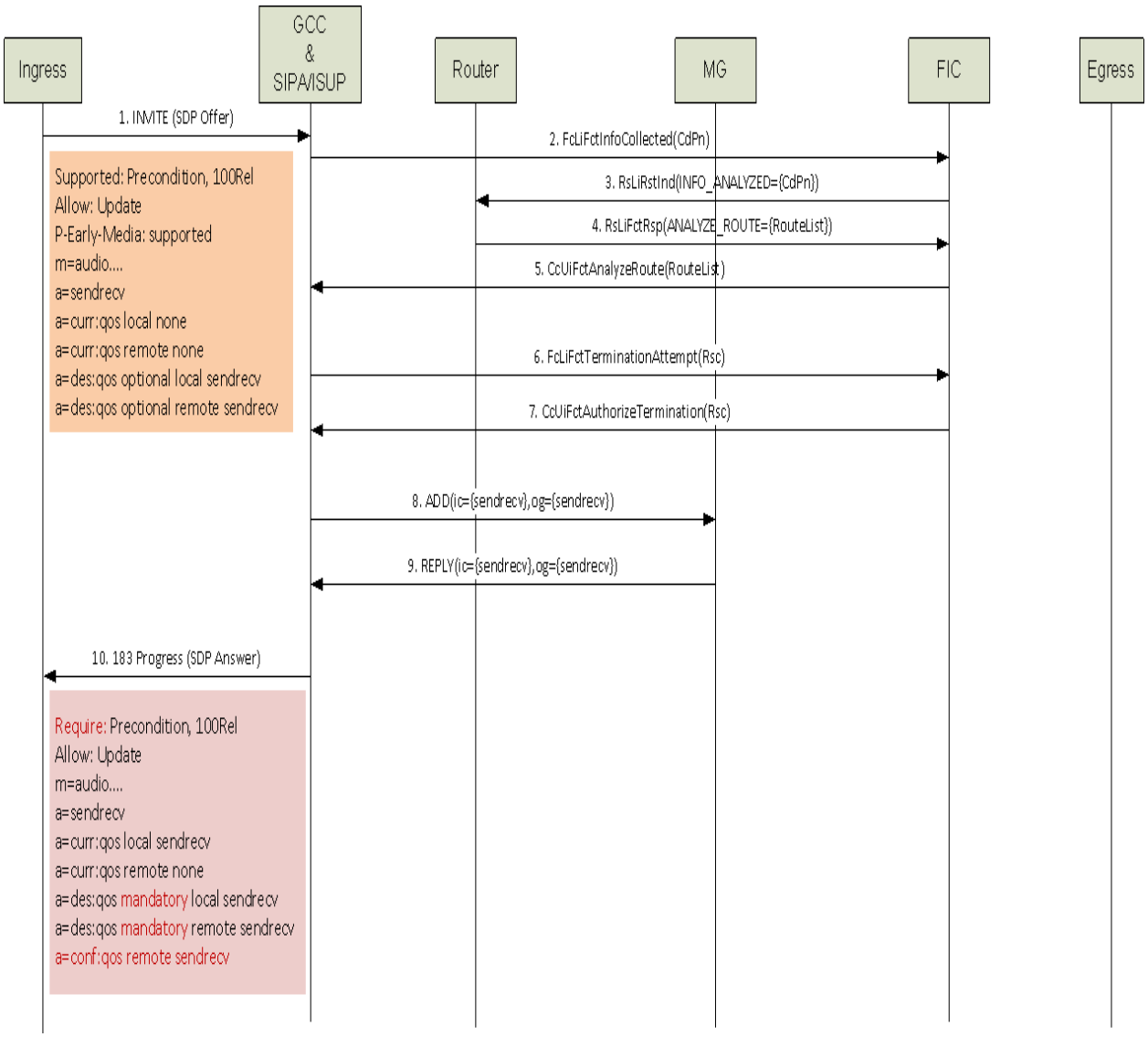

Figure 3: SIP to ISUP call without COT Preconditions – Call Flow 1

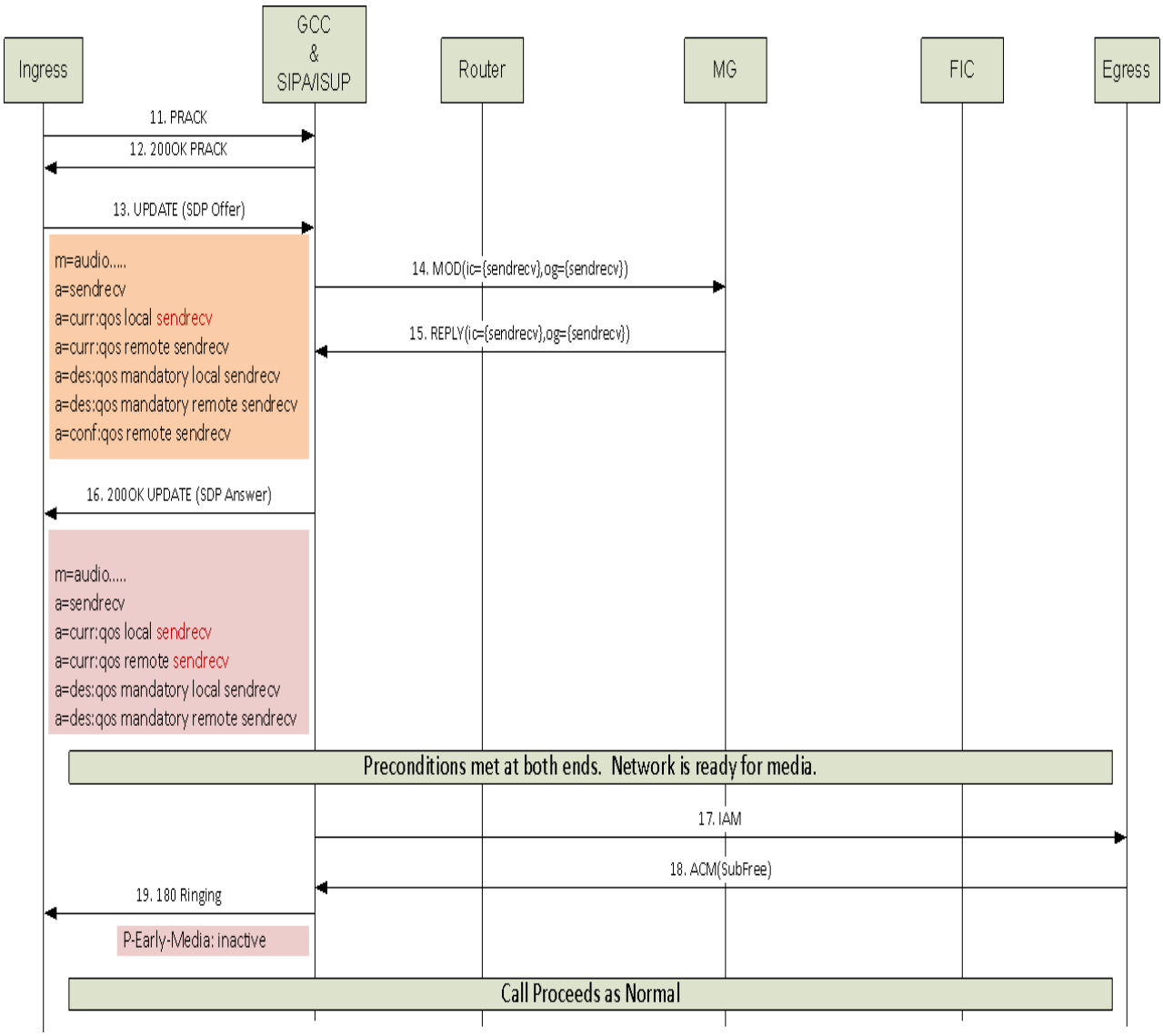

Figure 4: SIP to ISUP call without COT Preconditions – Call Flow 2

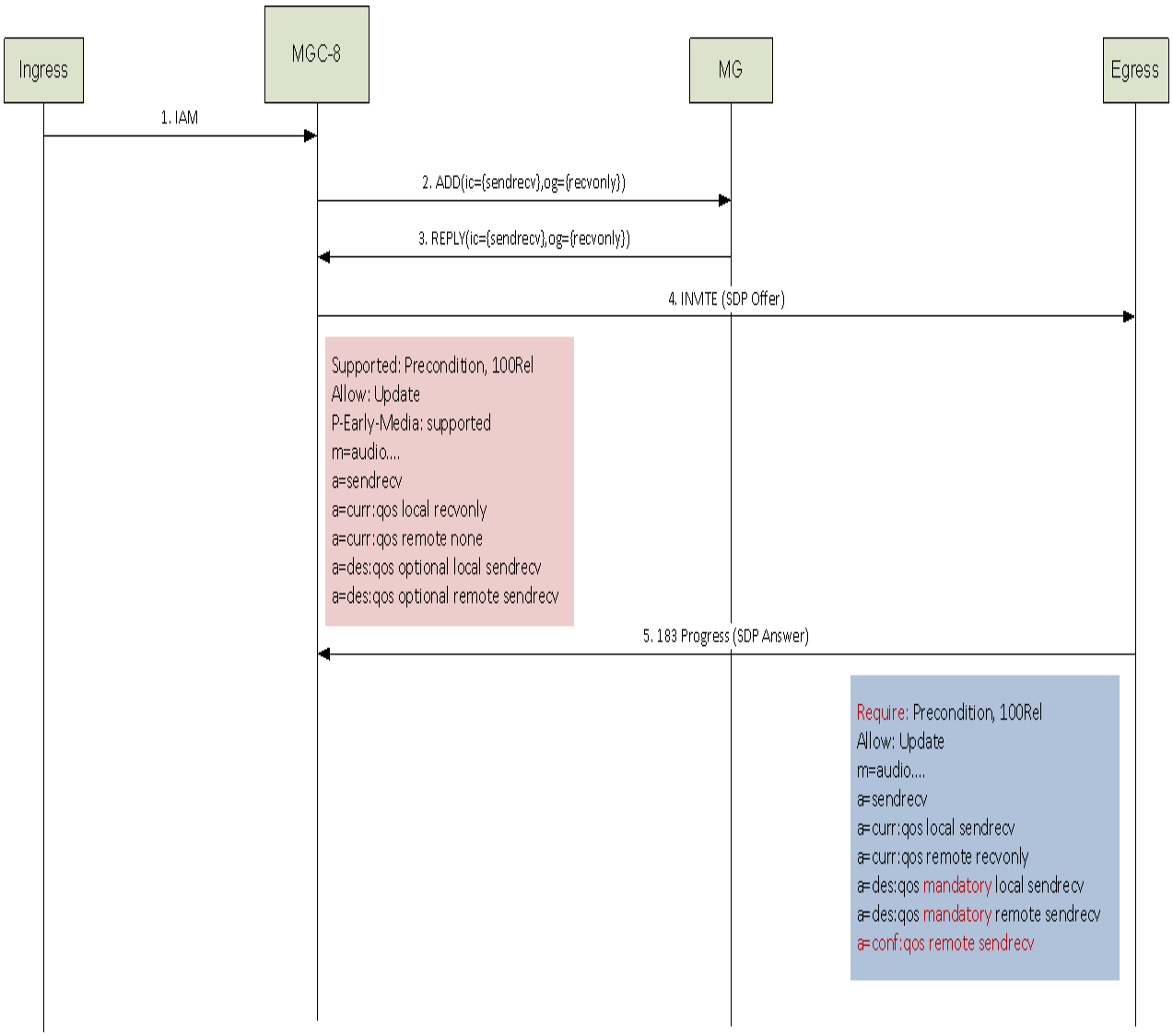

Figure 5: ISUP to SIP call Preconditions – Call Flow 1

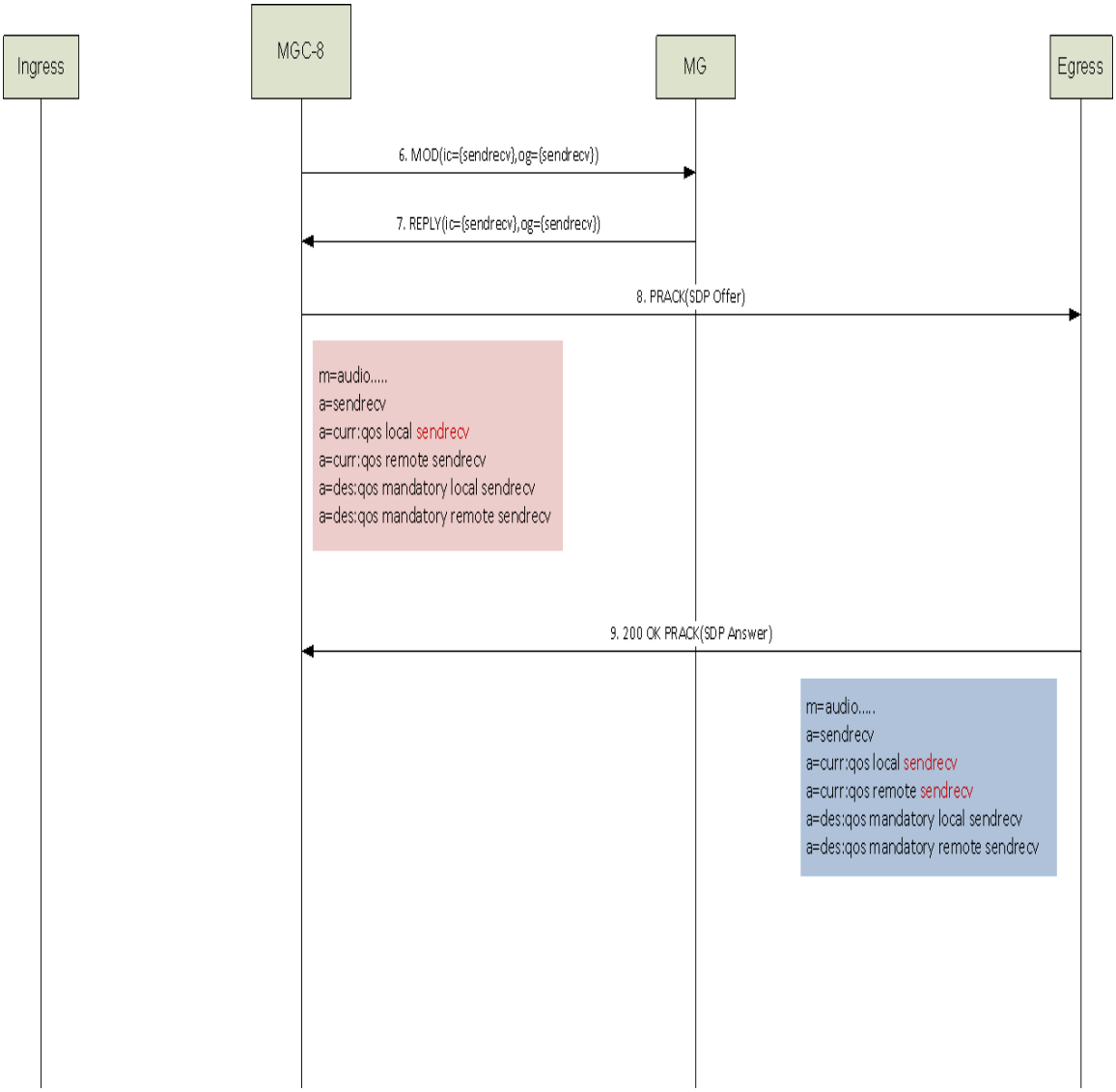

Figure 6: ISUP to SIP call Preconditions – Call Flow 2

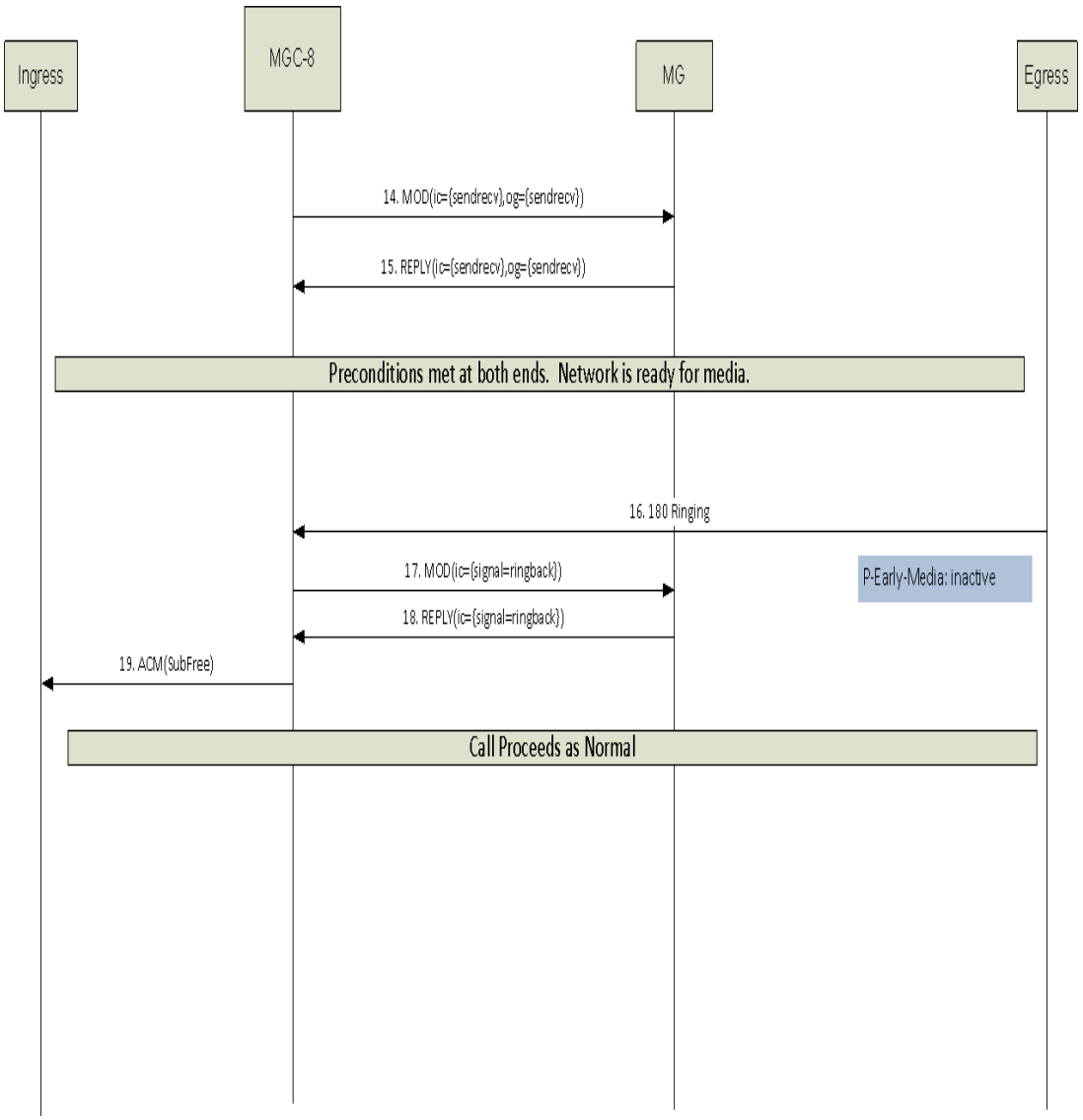

Figure 7: ISUP to SIP call Preconditions – Call Flow 3

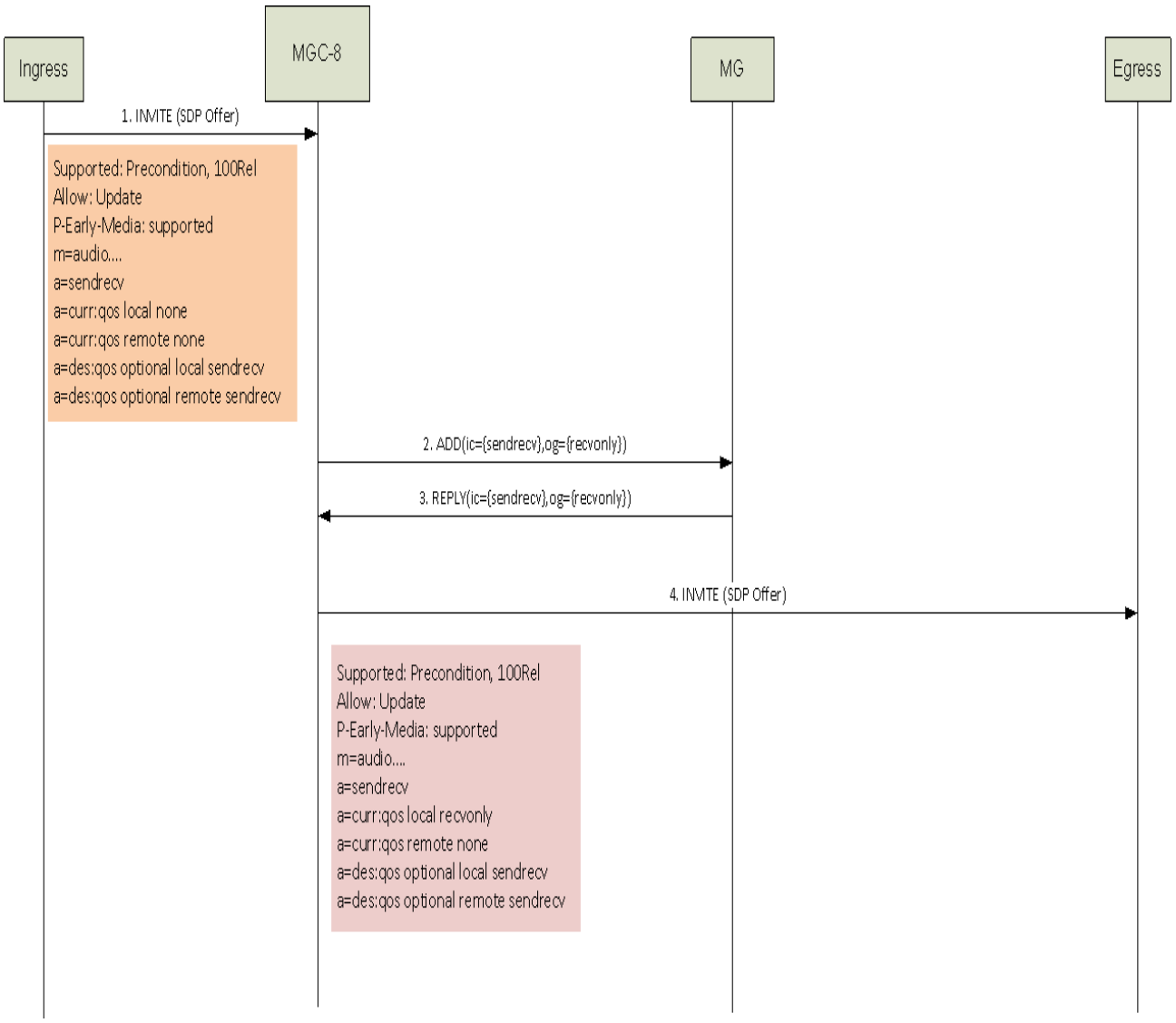

Figure 8: SIP to SIP with MGW call Preconditions – Call Flow 1

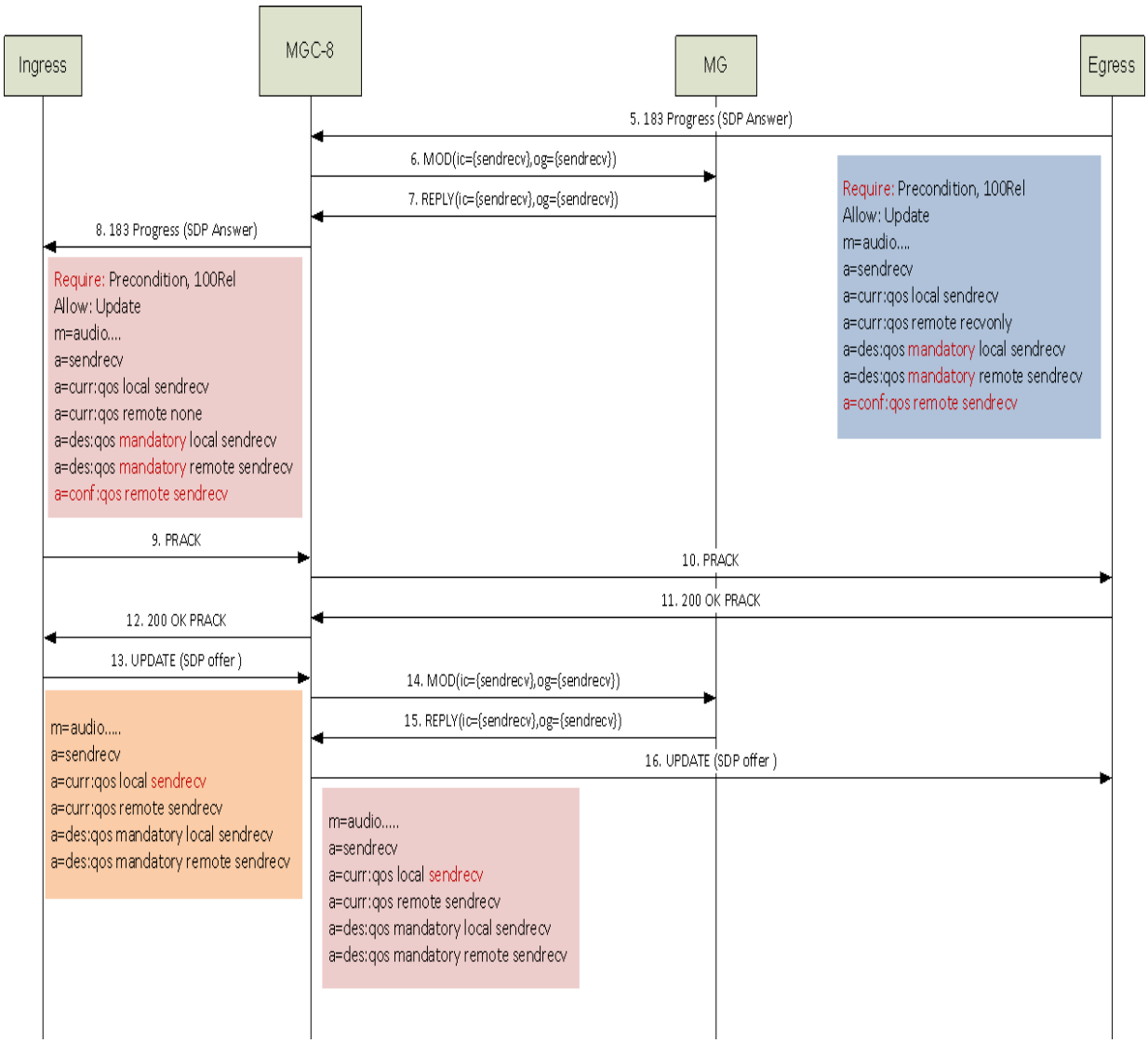

Figure 9: SIP to SIP with MGW call Preconditions – Call Flow 2

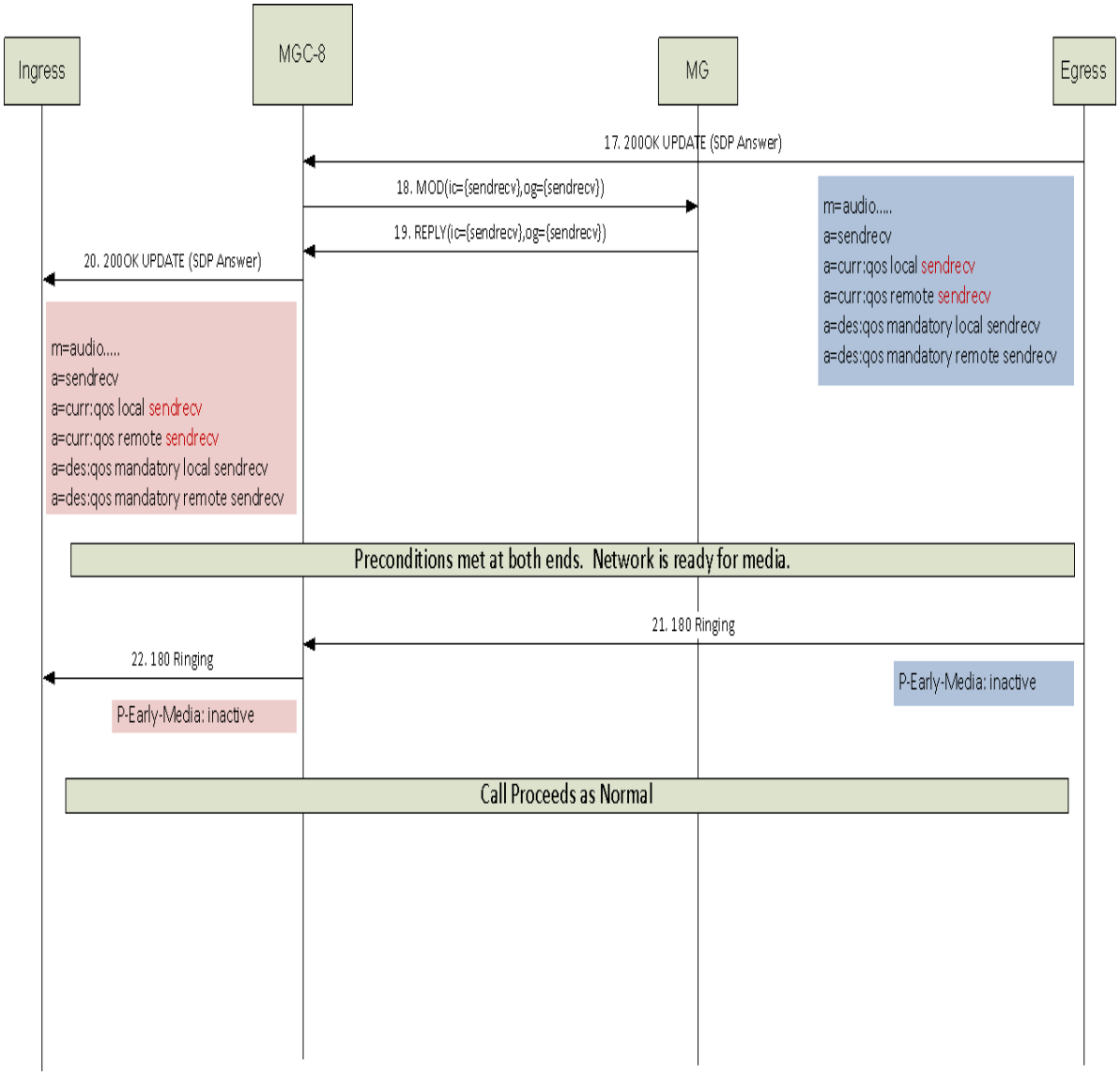

Figure 10: SIP to SIP with MGW call Preconditions – Call Flow 3

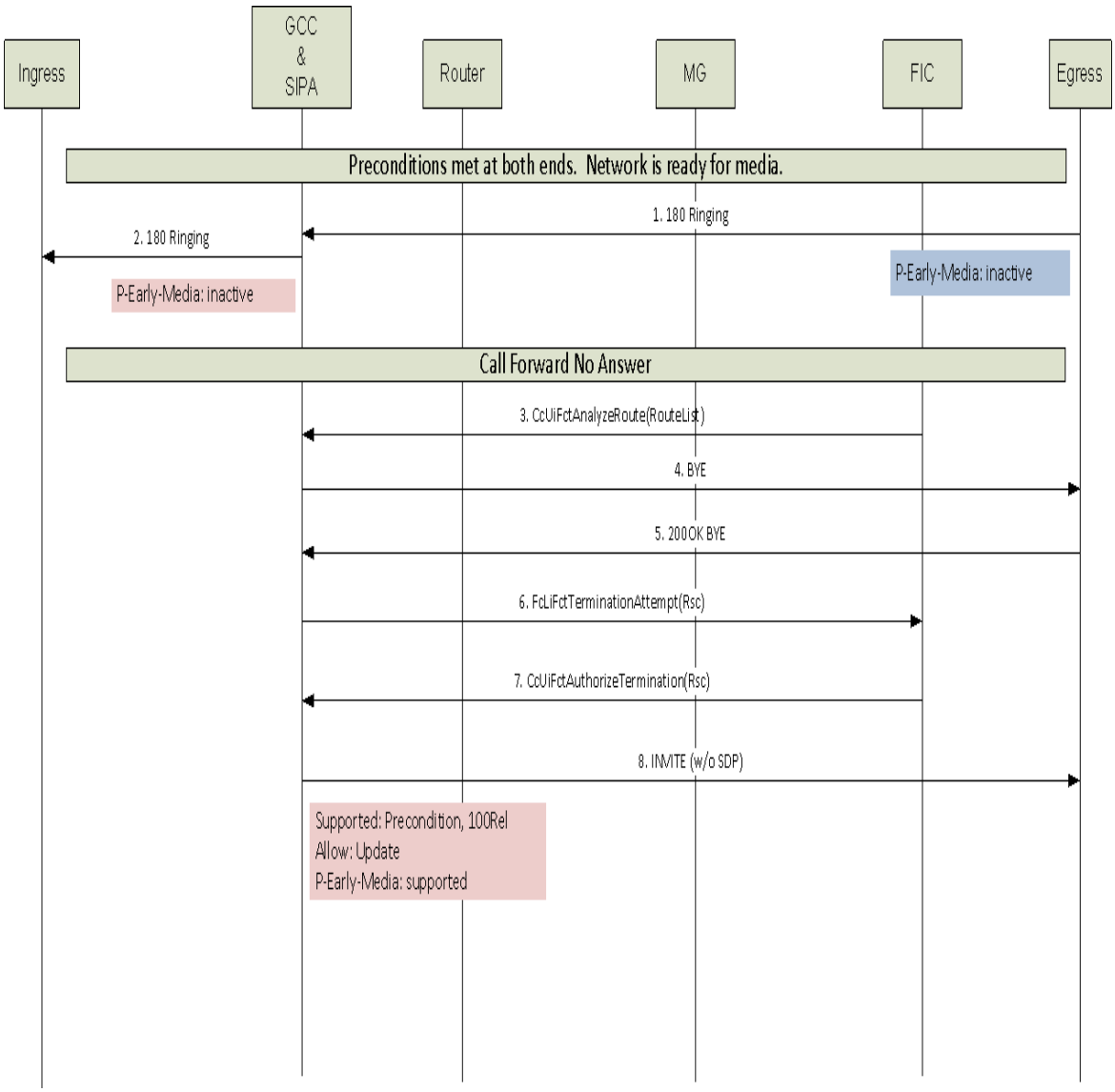

Figure 11: SIP to SIP without MGW call Preconditions – Call Flow 1

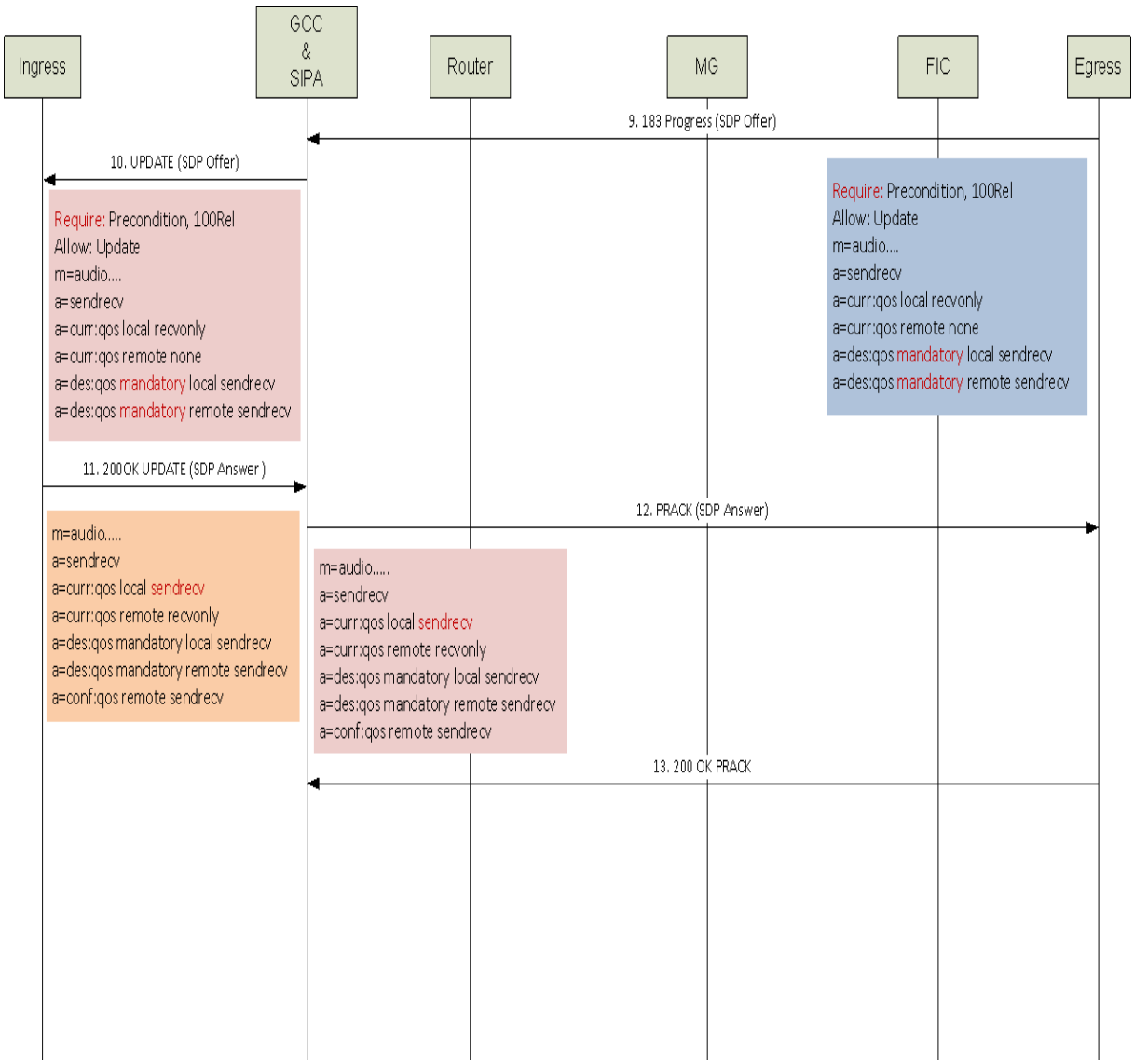

Figure 12: SIP to SIP without MGW call Preconditions – Call Flow 2

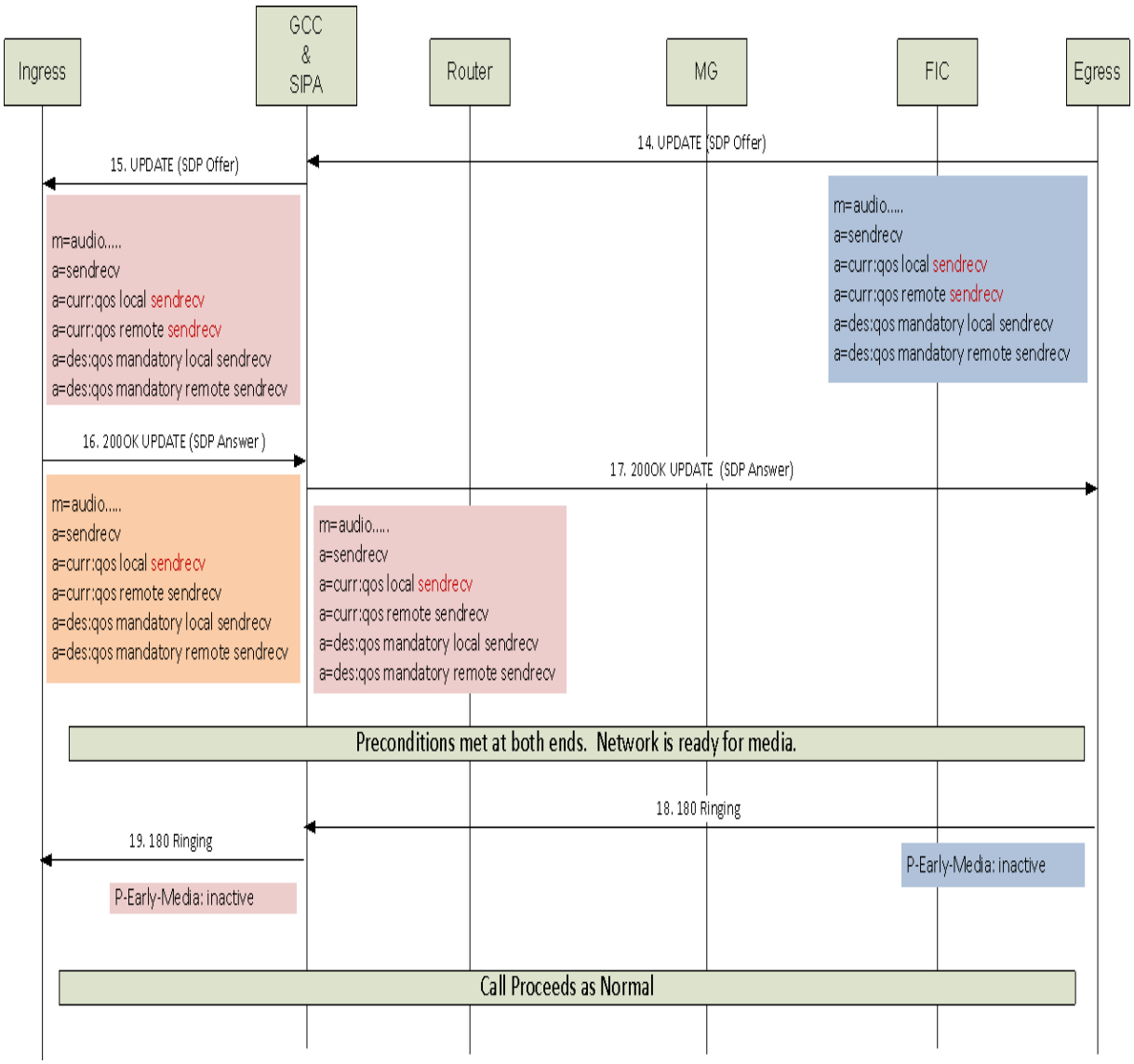

Figure 13: SIP to SIP without MGW call Preconditions – Call Flow 3

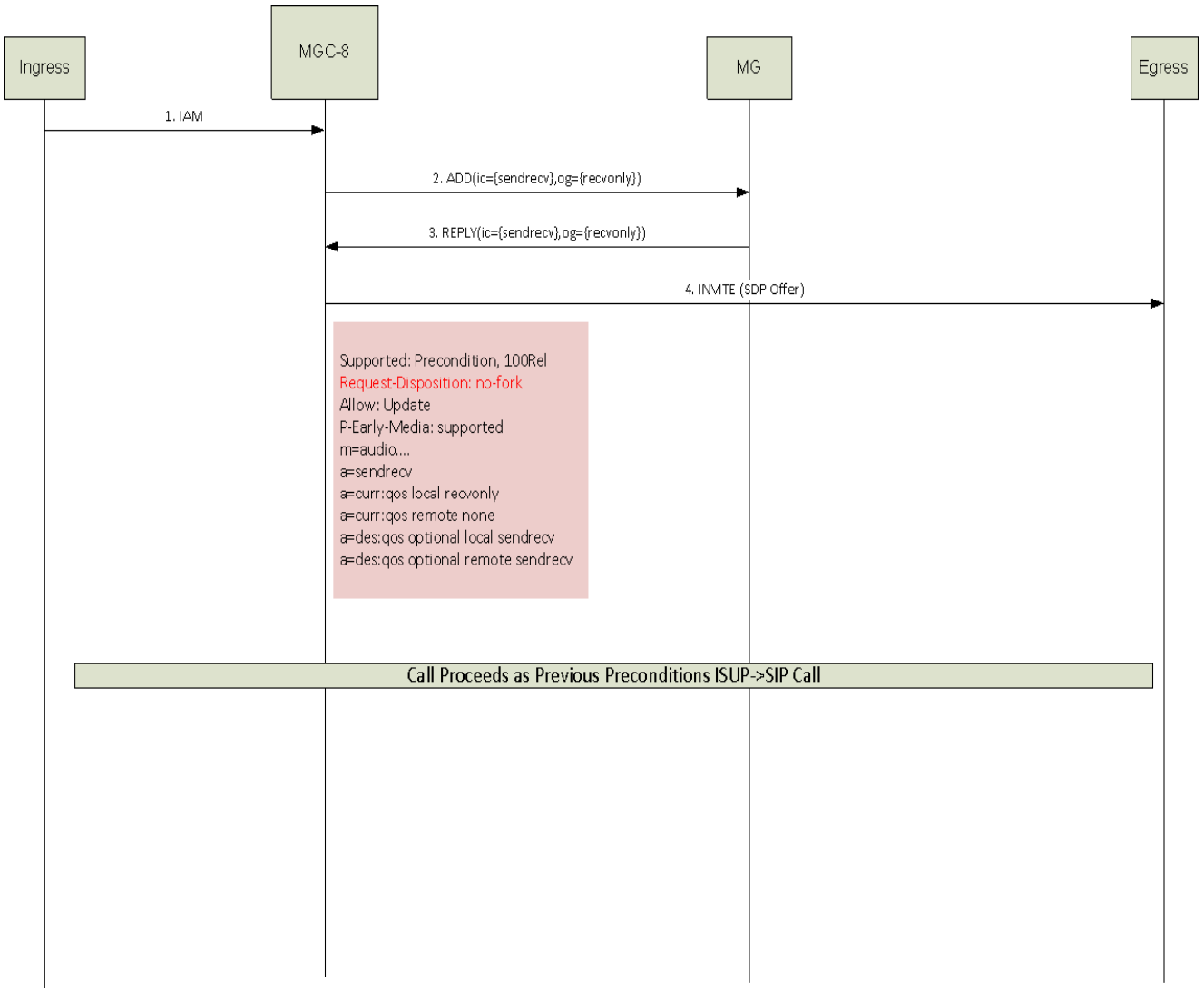

Figure 14: ISUP to SIP Preconditions No Forking Support Option Call Flow

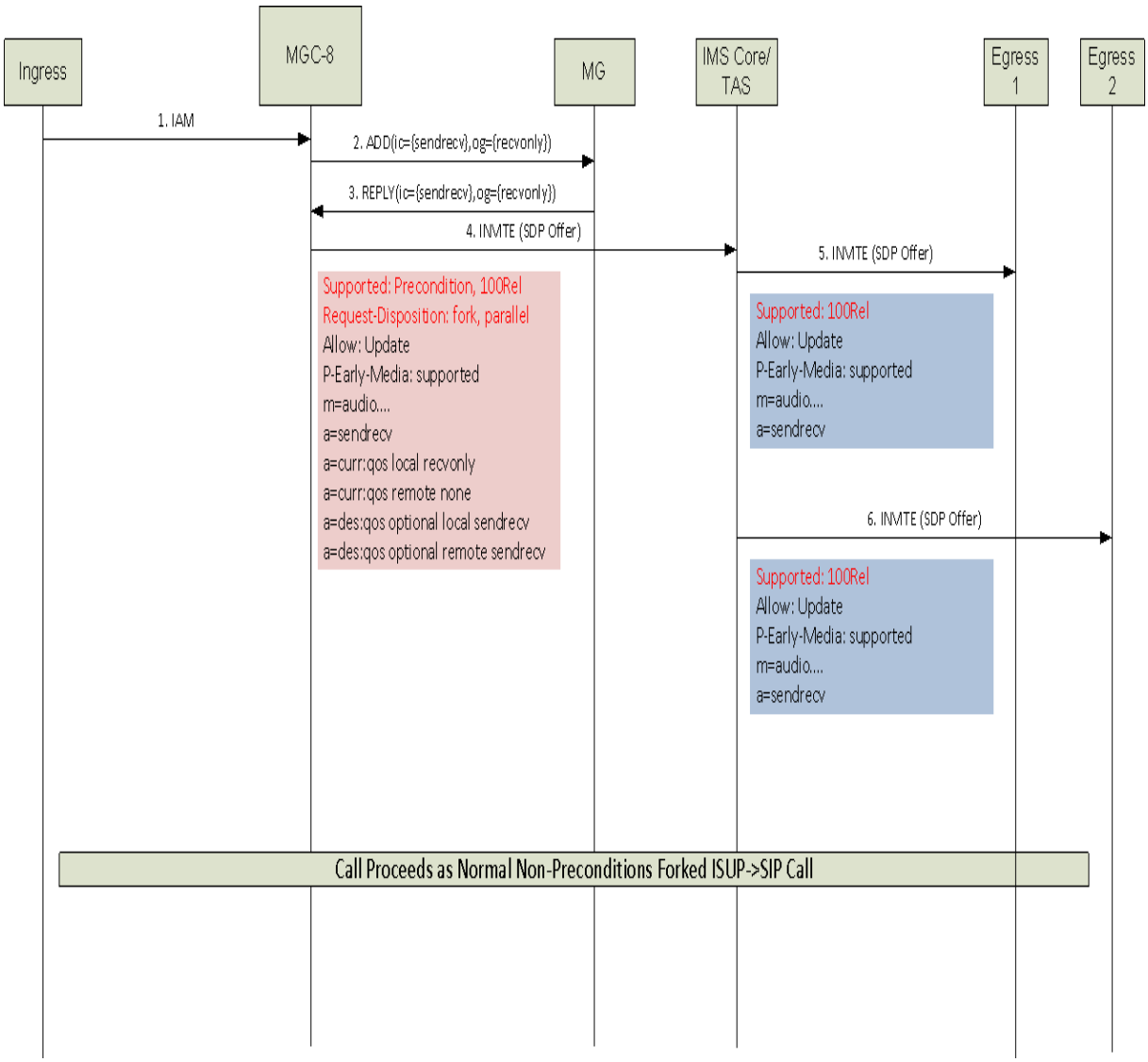

Figure 15: ISUP to SIP Preconditions Forking Call Flow where TAS Removes Preconditions Support Header

3. Requirements

3.1 Infrastructure Requirements

3.1.1 Hardware & Physical Design

N/A.

3.1.2 Software Infrastructure

N/A.

3.1.3 Common Requirements

N/A.

3.2 Network Controller Requirements

3.2.1 Call Processing

3.2.1.1 Base Requirements

REQUIREMENT BEGIN	
FID15068.0-0010	**Support SIP Preconditions SDP attributes**
Requirement:	**MGC-8 shall support SIP preconditions SDP attributes defined in RFC3312:** **current-status = "a=curr:" precondition-type SP status-type SP direction-tag** **desired-status = "a=des:" precondition-type SP strength-tag SP status-type SP direction-tag** **Confirm-status = "a=conf:" precondition-type SP status-type SP direction-tag** **precondition-type = "qos" | token** **strength-tag = ("mandatory" | "optional" | "none" = | "failure" | "unknown")** **status-type = ("e2e" | "local" | "remote")** **direction-tag = ("none" | "send" | "recv" | "sendrecv")** **Only precondition-type "qos" is supported.** **Status-type "e2e" is not supported.**
Explanation:	Note 1: "e2e" requires RSVP support, but MGC-8 doesn't support RSVP.
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN	
FID15068.0-0020	**Support the option tag "precondition" in Supported and Require headers**
Requirement:	**MGC-8 shall support the option tag "precondition" in Supported and Require headers per RFC3312.** **When MGC-8 replies 200OK to OPTIONS with MGC-8 capabilities (note 1), MGC-8 shall include the tag "precondition" in Supported header when the ingress SIP/SIP-I TG sipPreconds != off.**
Explanation:	Note 1: Including "Supported:precondition" in 200OK OPTIONS, is not applied to the scenario of proxying OPTIONS out and forwarding received 200OK to the ingress side. Note 2: RFC3312 section 12 defines to add preconditions desired-status lines into the SDP of the response to OPTIONS, which will not be supported by this feature because MGC-8 currently doesn't add SDP in 200OK to OPTIONS. Copy RFC3312 for reference:

12 Indicating Capabilities

The offer/answer model [4] describes the format of a session description to indicate capabilities. This format is used in responses to OPTIONS requests. A UA that supports preconditions SHOULD add desired status lines indicating the precondition-types supported for each media stream. These lines MUST have the "none" strength-tag, as shown in the example below:

```
m=audio 0 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=des:foo none e2e sendrecv
a=des:qos none local sendrecv
```

Note that when this document was published, the precondition-type "foo" has not been registered. It is used here in the session description above to provide an example with multiple precondition-types.

A UA that supports this framework SHOULD add a "precondition" tag to the Supported header field of its responses to OPTIONS requests.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-0040 **Ingress SIP/SIP-I TG disables preconditions support**

Requirement: **When the ingress SIP/SIP-I TG sets sipPreconds = off:**

- **if MGC-8 receives an INVITE with Supported:precondition and with/without SDP offer, MGC-8 shall ignore preconditions SDP lines if present and continue the call without preconditions (note 1).**
- **if MGC-8 receives an INVITE without "precondition" in Supported&Require headers and with/without SDP offer, MGC-8 shall ignore preconditions SDP lines if present and continue the call without preconditions (note 1).**
- **if MGC-8 receives an INVITE with Require:precondition and with/without SDP offer, MGC-8 shall reject the call with 420 Bad Extension (note 2).**

Explanation: Note 1: The egress can be ISUP/SIP/SIP-I/ISDN. The egress SIP/SIP-I may enable or disable SIP preconditions support.

Note 2: Replying 420 is the existing behavior prior to this feature.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-0050	**Cases of replying 580 when ingress SIP/SIP-I TG enables preconditions support**
Requirement:	**When the ingress SIP/SIP-I TG sets sipPreconds = ON_FORK or ON_NOFORK, MGC-8 shall reject the call with 580 as long as one of the following rainy cases is detected for one media stream:** ● **If MGC-8 receives an INVITE with Supported:precondition but the preconditions SDP lines contain at least one strength-tag=”mandatory” for precondition-type=”qos”(note 1);** ● **If MGC-8 receives an INVITE with preconditions SDP lines but neither Supported nor Require header contains “precondition” (note 1);** ● **If MGC-8 receives an INVITE with Require:precondition but neither Supported nor Require header contains “100rel” (note 2);** ● **if MGC-8 receives an INVITE with Require:precondition but without Allow:Update (note 2);** ● **if MGC-8 receives an INVITE with Require:precondition and with SDP offer but without preconditions attributes in SDP offer.**
Explanation:	Note 1: Copy RFC3312 for reference: We define the option tag "precondition" for use in the Require and Supported header fields. An offerer MUST include this tag in the Require header field if the offer contains one or more "mandatory" strength-tags. If all the strength-tags in the description are "optional" or "none", the offerer MUST include this tag in either a Supported header field or in a Require header field. It is, however, RECOMMENDED that the Supported header field be used in this case. The lack of preconditions in the answer would indicate that the answerer did not support this extension. Note 2: Copy RFC3312 for reference: The mapping of offers and answers to SIP requests and responses is performed following the rules given in [5]. Therefore, a user agent including preconditions in the SDP MUST support the PRACK and UPDATE methods. Consequently, it MUST include the "100rel" [7] tag in the Supported header field and SHOULD include an Allow header field with the "UPDATE" tag [5].
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-0060 **Parse preconditions SDP lines of INVITE when ingress SIP/SIP-I TG enables preconditions support**

Requirement: **The preconditions SDP lines per each media stream shall meet the following rules:**

- **Shall follow RFC3312 defined syntax for formats of current-status, desired-status and confirm-status lines (see FID15068.0-0010);**
- **Shall NOT contain precondition-type which is something other than "qos" (note 1);**
- **Shall NOT contain status-type which is something other than "local"/"remote";**
- **The SDP of INVITE/18x/PRACK/200OK PRACK/UPDATE/200OK UPDATE shall contain strength-tag = "none"/"optional"/"mandatory". Note strength-tag="failure"/"unknown" should be used in 580 SDP per RFC3312, but MGC-8 won't support SDP in 580.**
- **Shall NOT contain direction-tag which is something other than allowed strings defined in FID15068.0-0010.**
- **Shall contain current-status line per local/remote segment (note 2); If there are multiple correct current-status lines per local/remote segment, MGC-8 shall use the last line (note 3).**
- **Shall contain desired-status line per local/remote segment; If there are multiple correct desired-status lines for one direction (send or recv or sendrecv) of one segment (local or remote), MGC-8 shall use the last line (note 2, 3, 4).**

For a received INVITE, if its preconditions SDP lines of any one media stream don't meet the above rules, MGC-8 shall reject the INVITE with 580.

Explanation:

Note 1: For simplicity, MGC-8 rejects INVITE as long as there is precondition-type != "qos" regardless of its strength-tag and status-type, so MGC-8 implementation won't fully meet below RFC3312 requirements:

This document defines the "qos" tag for quality of service preconditions. New precondition-types defined in the future will have new associated tags. A UA that receives an unknown precondition-type, with a "mandatory" strength-tag in an offer, MUST refuse the offer unless the only unknown mandatory preconditions have the "local" tag. In this case, the UA does not need to be involved in order to meet the preconditions. The UA will ask for confirmation of the preconditions and, when the confirmation arrives, it will resume session establishment.

Note 2: Copy RFC3312 for reference:

For the segmented status type, the user agent MUST generate two current status lines: one with the tag "local" and the other with the tag "remote". The user agent MUST add one or two desired status lines per segment (i.e., local and remote). If, for a particular segment (local or remote), the tags for both directions in the transaction status table are equal (e.g., both "mandatory"), the user agent MUST add one desired status line with the tag "sendrecv". If both tags are different, the user agent MUST include two desired status lines, one with the tag "send" and the other with the tag "recv".

Examples of SDP lines complying to RFC3312:

Case 1:

```
a=curr:qos local none
a=curr:qos remote none
a=des:qos optional remote send
a=des:qos none remote recv
a=des:qos none local sendrecv
```

Case 2:

```
a=curr:qos local none
a=curr:qos remote none
a=des:qos optional remote send
a=des:qos none remote recv
a=des:qos mandatory local send
```

a=des:qos optional local recv
Case 3:
a=curr:qos local none
a=curr:qos remote none
a=des:qos optional remote sendrecv
a=des:qos mandatory local send
a=des:qos optional local recv
Case 4:
a=curr:qos local none
a=curr:qos remote none
a=des:qos optional remote sendrecv
a=des:qos none local sendrecv
a=conf:qos remote sendrecv

Note 3: To be less restricted, it's decided that to allow multiple current-status or desired-status lines for the same segment,

Note 4: To be less restricted, it's allowed to have the same strength-tag in the two desired-status lines (one for "send" and the other for "recv") of the same segment (local or remote).

Note 5: Since confirm-status line is optional, not include it as a mandatory requirement.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN	
FID15068.0-0070	**Parse preconditions SDP lines in received 18x/PRACK/200OK PRACK/UPDATE/200OK UPDATE**
Requirement:	**Before the call is answered, when MGC-8 has invoked preconditions procedure and receives 18x(reliable)/PRACK/200OK PRACK/UPDATE/200OK UPDATE which contain preconditions SDP offer/answer, MGC-8 shall do the validity check on the preconditions SDP lines per media stream following rules defined in FID15068.0-0060. Only if the preconditions SDP lines have passed checks in FID15068.0-0060, MGC-8 will follow requirements of subsequent sections for further handling of these messages.** **When MGC-8 as UAS receives PRACK/UPDATE/200OK UPDATE whose preconditions SDP lines of one media stream fail to meet FID15068.0-0060, MGC-8 shall send 580 to INVITE to the ingress side and send CANCEL to the egress side if the egress side is SIP/SIP-I, or send RELEASE/DISCONNECT to the egress side if the egress side is ISUP/ISDN.** **When MGC-8 as UAC receives 18x/200OK PRACK/UPDATE/200OK UPDATE whose preconditions SDP lines of one media stream fail to meet FID15068.0-0060, MGC-8 shall send CANCEL to the egress side and send 580 to INVITE to the ingress side if the ingress side is SIP/SIP-I, or send RELEASE/DISCONNECT to the ingress side if the ingress side is ISUP/ISDN.**
Explanation:	Note 1: See FID15068.0-0110 for Cause value.
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN	
FID15068.0-0075	**Tear down the preconditions call if SDP answer of 200OK PRACK/200OK UPDATE doesn't contain preconditions lines**
Requirement:	**For SIP/SIP-I <-> ISUP/ISDN and SIP/SIP-I to SIP/SIP-I with MGW call, when the preconditions of the call are NOT met and MGC-8 sends PRACK/UPDATE with SDP offer containing preconditions lines, but the received 200OK PRACK/UPDATE SDP answer doesn't contain preconditions lines, MGC-8 shall tear down the call , i.e.,** ● **Send Release if ingress/egress side is ISUP, note send Release to ISUP egress side only if IAM has been sent;** ● **Send Disconnect if ingress/egress side is ISDN;** ● **Send CANCEL if egress side is SIP;** ● **Send BYE if egress side is SIP-I;** ● **Send 580 if ingress side is SIP/SIP-I.**
Explanation:	Note 1: Checking the presence of preconditions lines in SDP answer of received PRACK/18x is covered in separate sections of each call scenario.
Components:	5060 MGC-8

References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN
FID15068.0-0080 **Not invoke preconditions procedure when ingress SIP/SIP-I TG enables preconditions support**

Requirement: **When the ingress SIP/SIP-I TG sets sipPreconds = ON_FORK or ON_NOFORK, for any one of following cases, MGC-8 shall continue the call without invoking preconditions:**

1. **The received INVITE (with SDP offer and with/without preconditions lines inside SDP, or without SDP offer) contains Supported:precondition, but neither Supported nor Require header contains "100rel". In case preconditions lines are present, MGC-8 shall ignore them and NOT check them with rules in FID15068.0-0060.**
2. **The received INVITE (with SDP offer and with/without preconditions lines inside SDP, or without SDP offer) contains Supported:precondition but doesn't contain Allow:Update. In case preconditions lines are present, MGC-8 shall ignore them and NOT check them with rules in FID15068.0-0060.**
3. **The received INVITE has SDP offer but no preconditions lines inside SDP, and contains Supported:precondition, "100rel" in Supported/Require header and Allow:Update.**
4. **The received INVITE has no SDP offer, neither Supported nor Require header contains "precondition".**
5. **The received INVITE has SDP offer but no preconditions lines inside SDP, neither Supported nor Require header contains "precondition".**

Explanation:

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-0090	**Ingress SIP/SIP-I TG enables preconditions support and egress SIP/SIP-I TG disables preconditions support**
Requirement:	**For SIP/SIP-I to SIP/SIP-I call, when the ingress SIP/SIP-I TG sets sipPreconds = ON_FORK or ON_NOFORK and the received INVITE requests preconditions and has passed the checks done in FID15068.0-0050 and 0060, but the egress SIP/SIP-I TG sets sipPreconds = off:** ● **If the received INVITE just requests Supported:precondition, MGC-8 shall continue the call without preconditions, i.e., send INVITE without Supported/Require:precondition header and without preconditions attributes in SDP offer (only if SDP offer is available).** ● **If the received INVITE just requests Require:precondition, MGC-8 shall reject the call with 580.**
Explanation:	
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-0100	**Not include preconditions SDP in sent 580/BYE/CANCEL**
Requirement:	**Whenever MGC-8 sends 580/BYE/CANCEL as a result of preconditions failures, MGC-8 shall NOT include the preconditions SDP in 580/BYE/CANCEL.** **For SDP in received 580/BYE/CANCEL, MGC-8 shall still ignore it as of existing way.**
Explanation:	Note 1: RFC3312 requires including preconditions SDP in 580/CANCEL, but MGC-8 currently doesn't include SDP in response/CANCEL, since this just gives some information why it's rejected, we decided not to support it in order to save development effort.
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN	
FID15068.0-0110	**Reason header and cause value in sent 580/BYE/CANCEL/RELEASE/DISCONNECT**
Requirement:	**Whenever MGC-8 sends 580/BYE/CANCEL as a result of preconditions failures, if Reason header is enabled (PRFL-SIP/SIPT reasonHdr=Y), MGC-8 shall include Reason header into sent 580/BYE/CANCEL.** **For 580/BYE/CANCEL Reason header sent in Q.850 format (PRFL-SIP/SIPT reasonHdrPrtcl=Q.850), the default cause value in Reason header is 127 if the cause value can't be mapped from egress received SIP Reason header/ISUP cause value or via FAILCND (note 1).** **For BYE/CANCEL Reason header sent in SIP format (PRFL-SIP/SIPT reasonHdrPrtcl=SIP), the status code shall be 580 with text "Precondition Failure" if the Reason header status code can't be mapped from egress received SIP Reason header/ISUP cause value or via FAILCND.** **Whenever MGC-8 sends ISUP RELEASE or ISDN DISCONNECT as a result of preconditions failures, MGC-8 shall set the default cause value to 127 if the cause value can't be mapped from SIP Reason header or via FAILCND (note 1).**
Explanation:	Note 1: Still follow the existing priority for setting cause value, i.e., FAILCND configuration > mapping from SIP Reason/ISUP cause value > default value. Note 2: Example of Reason header in SIP format: Reason:SIP;cause=580 ;text="Precondition Failure" Example of Reason header in Q.850 format: Reason:Q.850;cause=127;text="Interworking"
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN	
FID15068.0-0150	**Support preconditions for intra/inter-CCS and intra/inter-MGW**
Requirement:	**Preconditions shall be supported for intra/inter-CCS and intra/inter-MGW calls.**
Explanation:	
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN

FID15068.0-0160	**Not include encapsulated ISUP body in firstly sent 180/183 for SIP-I to SIP/SIP-I/ISUP/ISDN preconditions negotiation**
Requirement:	**For SIP-I to SIP/ISUP/ISDN preconditions call, MGC-8 shall not include encapsulated ISUP body in the first 180(note 1)/183 sent to the ingress side which contains SDP (offer or answer) with preconditions lines used for preconditions negotiation. MGC-8 shall still include encapsulated ISUP body in subsequently 18x sent to the ingress side as of existing mapping rule.** **For SIP-I to SIP-I preconditions call, the firstly sent 180(note 1)/183 used for preconditions negotiation shall not include encapsulated ISUP body unless the received 180(note 1)/183 contains ISUP body (note 2). The subsequent 18x sent to the ingress side in the middle of preconditions (note 3) shall use the same rule too.**
Explanation:	Note 1: In normal case, the firstly received/sent 18x for preconditions shall be 183. But MGC-8 handles received 180 with preconditions (in case it's received) in the same way of 183 with preconditions. Note 2: In normal case, 183 used for preconditions shall not contain ISUP body at receiving. Note 3: In normal case, it's not expected to receive more 18x in the middle of preconditions.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-0170	**Handling of the first 181/182**
Requirement:	**For ISUP/ISDN/SIP/SIP-I to SIP/SIP-I call, after MGC-8 sends INVITE with Supported:precondition or Require:precondition, if the firstly received 18x message is 181/182, 181/182 is handled in the same way of the first 180/183 for preconditions, that's to say:** ● **If 181/182 contains headers and SDP lines used for preconditions, MGC-8 invokes preconditions procedure.** ● **If 181/182 doesn't contain headers and/or SDP lines used for preconditions, MGC-8 aborts preconditions if sent INVITE contains Supported:precondition.** ● **If 181/182 doesn't contain headers and/or SDP lines used for preconditions, MGC-8 fails the call if sent INVITE contains Require:precondition.**
Explanation:	Note 1: For CFU service, currently CTS may send 181 followed by 183 connecting with MRF announcement for CFU notification if INVITE contains Supported:precondition, or send only 181 (no subsequent 183 for CFx announcement) if INVITE contains Require:precondition. The 181 and 183 for

	CFx notification don't contain preconditions. After a discussion with CTS, they agree to plan a feature to skip sending 181 when forwarding call with preconditions: http://aww.ngn.bel.alcatel.be/D/FSD_ENS_RnD_EPG/Tools/webRMT/rcr?id=95700 Note 2: There is no RFC to define how to handle the intermediate 181/182.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-0180	**Include Supported:precondition or Require:precondition in MGC-8 sent UPDATE/PRACK/200OK UPDATE/200OK PRACK containing preconditions lines**
Requirement:	**For ISUP/ISDN<->SIP/SIP-I preconditions call, whenever MGC-8 sends UPDATE/PRACK/200OK UPDATE/200OK PRACK containing SDP offer/answer with preconditions lines, if there is at least one Mandatory strength-tag, MGC-8 shall include Require:precondition; otherwise, MGC-8 shall include Supported:precondition.** **For SIP/SIP-I to SIP/SIP-I preconditions call, MGC-8 shall include precondition tag in Supported/Require header same as what's received in UPDATE/PRACK/200OK UPDATE/200OK PRACK.**
Explanation:	Note 1: For INVITE and 183 sent by MGC-8, inclusion of Supported/Require:precondition is covered in requirements of each scenario.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-0190	**SIP/SIP-I to SIP/SIP-I call – Send SDP offer w/o preconditions lines and receives SDP answer with preconditions lines**
Requirement:	**For SIP/SIP-I to SIP/SIP-I preconditions call with/without MGW, during preconditions negotiation, when MGC-8 sends SDP offer (e.g., PRACK, UPDATE) not containing preconditions lines because the received SDP offer has no preconditions lines:** ● **If receiving SDP answer with preconditions lines, MGC-8 shall use the preconditions lines of SDP answer to update preconditions status table and send SDP answer with preconditions lines.** ● **If receiving SDP answer without preconditions lines, MGC-8 shall send SDP answer without preconditions lines.**
Explanation:	

Components: 5060 MGC-8
References:
Owner: April Liu
History:
REQUIREMENT END

3.2.1.2 MGC-8 "qos" Preconditions Status Table

REQUIREMENT BEGIN
FID15068.0-0200 **MGC-8 "qos" preconditions status table**

Requirement: **For a "qos" preconditions call, MGC-8 as UAC/UAS shall maintain and update a preconditions status table per each media stream and per egress/ingress SIP/SIP-I leg as shown in Table 1:**

Table 1

Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Local	**none/send/recv/ sendrecv**	**none/optional/mandatory**	**none/optional/mandatory**
Remote	**none/send/recv/ sendrecv**	**none/optional/mandatory**	**none/optional/mandatory**

This requirement is not applicable to SIP/SIP-I to SIP/SIP-I call w/o MGW.

Explanation: Note 1: There is only one table at the egress leg for ISUP/ISDN to SIP/SIP-I call; There is only one table at the ingress leg for SIP/SIP-I to ISUP/ISDN call; There are two tables (one for the ingress leg, the other for the egress leg) per each media stream for SIP/SIP-I to SIP/SIP-I with MGW call.

Note 2: This table is defined only for requirement purpose, the development team can choose the way how they want to implement.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-0230 **Rules to build preconditions SDP lines in SDP offer/answer**

Requirement: **Assume the latest "qos" preconditions status table of the ingress/egress leg of one media stream is:**

Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Local	X=none/send/recv/sendrecv	D1=none/optional/mandatory	D2=none/optional/mandatory
Remote	Y=none/send/recv/sendrecv	D3=none/optional/mandatory	D4=none/optional/mandatory

When MGC-8 is to send SDP offer/answer towards the ingress/egress leg, MGC-8 shall follow below rules to build preconditions SDP lines into SDP offer/answer:

1. **The current-status of local segment shall be:**
   a=curr:qos local X
2. **The current-status of remote segment shall be:**
   a=curr:qos remote Y
3. **The desired-status of local segment shall be:**
   - **If D1 equals to D2:**
     a=des:qos D1 local sendrecv
   - **If D1 not equal to D2:**
     a=des:qos D1 local send
     a=des:qos D2 local recv
4. **The desired-status of remote segment shall be:**
   - **If D3 equals to D4:**
     a=des:qos D3 remote sendrecv
   - **If D3 not equal to D4:**
     a=des:qos D3 remote send
     a=des:qos D4 remote recv

Before sending SDP offer/answer to the ingress/egress leg, if MGC-8 finds the preconditions of the remote segment of the corresponding leg are not met, MGC-8 shall include a=conf:qos in SDP offer/answer except the initial SDP offer by following rules as below:

1. **If both D3 and D4 are not none:**
   a=conf:qos remote sendrecv
2. **If D3 is none and D4 is not none:**
   a=conf:qos remote recv
3. **If D3 is not none and D4 is none:**
   a=conf:qos remote send
4. **If both D3 and D4 are none, don't include a=conf:qos.**

Explanation:

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-0240	**Rules to determine preconditions are met for "qos" precondition-type**
Requirement:	**For a preconditions call, MGC-8 shall use the following rule to determine if its "qos" preconditions are met:** **1. At the ingress/egress leg, for each segment (local/remote) of one media stream, if the current "direction-tag" of the particular segment is equal to or better than (note 1) the "direction-tag" of all desired-status attributes with "strength-tag"=mandatory in the same segment, the preconditions are considered to be met for that media stream at the ingress/egress leg.** **2. If preconditions of all media streams at the ingress/egress leg (note 2) are met based on the bullet 1, then the preconditions of the call have been met.**
Explanation:	Note 1: Example 1: assume the local segment has strength-tag=mandatory only for local send direction, the preconditions of the local segment are met when local current status is either send or sendrecv. Example 2: assume the remote segment has strength-tag=mandatory for remote sendrecv direction, the preconditions of the remote segment are met only when remote current status is sendrecv. Note 2: For SIP/SIP-I to ISUP/ISDN call, only look at the preconditions status at the ingress leg; For ISUP/ISDN to SIP/SIP-I call, only look at the preconditions status at the egress leg; For SIP/SIP-I to SIP/SIP-I with MGW call, must look at the preconditions status at both ingress and egress legs.
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-0245	**Preconditions NOT met when call setup timer expires**
Requirement:	**For any types of preconditions call, if MGC-8 is holding on the call until the call setup timer expires because the preconditions of the call are "NOT met", MGC-8 shall tear down the call as of the existing way, i.e., send Release to ISUP ingress side and to egress side only if IAM has been sent; send Disconnect to the ISDN ingress/egress side, send CANCEL to SIP/SIP-I egress side, send 504 to SIP/SIP-I ingress side.**
Explanation:	Note 1: The call setup timer is 600seconds.
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	

REQUIREMENT END

3.2.1.3 SIP/SIP-I to ISUP Preconditions Call

REQUIREMENT BEGIN

FID15068.0-1010 **SIP/SIP-I to ISUP call with COT and Initial INVITE with SDP offer - Send IAM(COT) and reliable 183**

Requirement:

For SIP/SIP-I to ISUP call, when all of the following conditions are true:

1. **The initial INVITE includes the option tag "precondition" in either Supported or Require header, and**
2. **The initial INVITE includes the option tag "100rel" in either Supported or Require header, and**
3. **The initial INVITE includes the option tag "UPDATE" in Allow header, and**
4. **The TL1 knob sipPreconds != off of PRFL-SIP/SIPT, and**
5. **The initial INVITE contains SDP offer with preconditions attributes and has passed the checks done in FID15068.0-0050 and 0060, and**
6. **There is continuity test performed for this call based on egress ISUP TRKGRP CotFreq.**

MGC-8 shall insert MGW for the call (note 1) and send IAM with "continuity check performed on this call".

After the continuity test is successfully performed on the egress termination, MGC-8 shall send 183 reliably with SDP answer containing preconditions attributes, which shall be built per the below 3.2.1.3-1 "qos" preconditions status table of the ingress leg and rules defined in FID15068.0-0230.

Table 3.2.1.3-1

Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Local	= sendrecv	= mandatory (note 2)	= mandatory (note 2)
Remote	= "direction-tag" of current-status of Local segment in SDP offer	= mandatory (note 2)	= mandatory (note 2)

The sent reliable183 shall contain "Require:Precondition, 100Rel" and "Allow:Update". For SIP-I ingress TG, the sent 183 should not contain ISUP body.

Explanation:

Note 1: Follow the existing way for the content of H.248 Add/Modify.

Note 2: Per RFC3312 and RFC4032, the offer may upgrade or downgrade desired "strength-tag", and the answer may upgrade desired "strength-tag" but must not downgrade desired "strength-tag". For simplicity, it's decided that MGC-8 as answer always upgrades desired "strength-tag" to "mandatory" regardless of desired "strength-tag" in INVITE SDP offer.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:

REQUIREMENT END

REQUIREMENT BEGIN	
FID15068.0-1020	**SIP/SIP-I to ISUP call without COT and Initial INVITE with SDP offer - Send reliable 183**
Requirement:	**For SIP/SIP-I to ISUP call, when all of the following conditions are true:** **1. The initial INVITE includes the option tag "Precondition" in either Supported or Require header, and** **2. The initial INVITE includes the option tag "100Rel" in either Supported or Require header, and** **3. The initial INVITE includes the option tag "UPDATE" in Allow header, and** **4. The TL1 knob sipPreconds != off in PRFL-SIP/SIPT, and** **5. The initial INVITE contains SDP offer with preconditions attributes and has passed the checks done in FID15068.0-0050 and 0060, and** **6. There is NO continuity test for this call based on egress ISUP TRKGRP CotFreq.** **MGC-8 shall insert MGW for the call, send 183 reliably with SDP answer containing preconditions attributes based on the Table 3.2.1.3-1 of FID15068.00-1010 by following rules defined in FID15068.0-0230.** **The sent 183 shall contain "Require:Precondition, 100Rel" and "Allow:Update". For SIP-I ingress TG, the sent 183 should not contain ISUP body.** **MGC-8 shall not send IAM at this point, refer to FID15068.0-1080 for when IAM will be sent.**
Explanation:	
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN	
FID15068.0-1030	**SIP/SIP-I to ISUP call with/without COT and Initial INVITE with SDP offer – Receive PRACK with/without SDP offer**
Requirement:	**When MGC-8 receives PRACK to 183 which was sent in FID15068.0-1010 or 1020, if PRACK contains SDP offer with preconditions attributes which have passed checks in FID15068.0-0070, MGC-8 shall :** ● **Modify H.248 context with PRACK SDP offer, and** ● **Update the "qos" preconditions status table of the ingress leg to the Table 3.2.1.3-1 of FID15068.0-1010, and** ● **Reply 200OK PRACK with preconditions SDP answer based on the Table 3.2.1.3-1 of FID15068.0-1010 by following rules defined in FID15068.0-0230.** **If PRACK doesn't contain SDP offer, MGC-8 shall handle PRACK and reply 200OK PRACK without SDP answer as of existing way.** **If PRACK has SDP offer but doesn't contain preconditions lines in SDP offer, MGC-8 shall reply 200OK PRACK with SDP answer containing preconditions lines (note 1) which are the same as what are included in 183 SDP answer.**
Explanation:	Note 1: The development team thinks it's hard not to include preconditions lines in SDP answer.
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN

FID15068.0-1040 **SIP/SIP-I to ISUP call with COT and Initial INVITE w/o SDP - Send IAM(COT) and reliable 183 with SDP offer**

Requirement:

For SIP/SIP-I to ISUP call, when all of the following conditions are true:

1. **The initial INVITE includes the option tag "precondition" in either Supported or Require header, and**
2. **The initial INVITE includes the option tag "100rel" in either Supported or Require header, and**
3. **The initial INVITE includes the option tag "UPDATE" in Allow header, and**
4. **The TL1 knob sipPreconds != off of PRFL-SIP/SIPT, and**
5. **The initial INVITE has no SDP, and**
6. **There is continuity test performed for this call based on egress ISUP TRKGRP CotFreq.**

MGC-8 shall insert MGW for the call and send IAM with "continuity check performed on this call".

After the continuity test is successfully performed on the egress termination, MGC-8 shall send 183 reliably with SDP offer containing preconditions attributes, which shall be built per the below "qos" preconditions status table of the ingress leg and rules defined in FID15068.0-0230.

Table 3.2.1.3-2

Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Local	= recv	= mandatory (note 1)	= mandatory (note 1)
Remote	= none	= mandatory (note 1)	= mandatory (note 1)

The sent reliable183 shall contain "Require:precondition, 100Rel" and "Allow:Update". For SIP-I ingress TG, the sent 183 should not contain ISUP body.

Explanation: Note 1: For simplicity, MGC-8 sets to MANDATORY no matter initial INVITE contains Supported:precondition or Require:precondition.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:

REQUIREMENT END

REQUIREMENT BEGIN	
FID15068.0-1050	**SIP/SIP-I to ISUP call without COT and Initial INVITE w/o SDP - Send reliable 183 with SDP offer**
Requirement:	**For SIP/SIP-I to ISUP call, when all of the following conditions are true:** **1. The initial INVITE includes the option tag "Precondition" in either Supported or Require header, and** **2. The initial INVITE includes the option tag "100Rel" in either Supported or Require header, and** **3. The initial INVITE includes the option tag "UPDATE" in Allow header, and** **4. The TL1 knob sipPreconds != off in PRFL-SIP/SIPT, and** **5. The initial INVITE has no SDP, and** **6. There is NO continuity test for this call based on egress ISUP TRKGRP CotFreq.** **MGC-8 shall insert MGW for the call, send 183 reliably with SDP offer containing preconditions attributes based on the Table 3.2.1.3-2 of FID15068.00-1040 by following rules defined in FID15068.0-0230.** **The sent reliable183 shall contain "Require:precondition, 100Rel" and "Allow:Update". For SIP-I ingress TG, the sent 183 should not contain ISUP body.** **MGC-8 shall not send IAM at this point, refer to FID15068.0-1080 for when IAM will be sent.**
Explanation:	
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN

FID15068.0-1060 **SIP/SIP-I to ISUP call with/without COT and Initial INVITE w/o SDP – Receive PRACK with SDP answer and send UPDATE**

Requirement:

When MGC-8 receives PRACK with SDP answer containing preconditions attributes (which have passed checks in FID15068.0-0070) to 183 which was sent in FID15068.0-1040 or 1050, MGC-8 shall :

- **Modify H.248 context with PRACK SDP answer, and**
- **Reply 200OK PRACK w/o SDP, and**
- **Update the "qos" preconditions status table of the ingress leg to the Table 3.2.1.3-3:**

Table 3.2.1.3-3

Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Local	= sendrecv	= mandatory (note 2)	= mandatory (note 2)
Remote	= "direction-tag" of current-status of Local segment in SDP answer	= mandatory (note 2)	= mandatory (note 2)

If MGC-8 finds the "qos" preconditions of local segments have been satisfied based on the above Table 3.2.1.3-3 and rules defined in FID15068.0-0240, and only if the SDP answer in PRACK has contained confirm-status of remote segment (note 1), MGC-8 shall send UPDATE with SDP offer containing preconditions attributes based on the above Table 3.2.1.3-3 by following rules defined in FID15068.0-0230. And when MGC-8 receives 200OK UPDATE with SDP answer containing preconditions attributes (which have passed checks in FID15068.0-0070), MGC-8 shall update the "qos" preconditions status table of the ingress leg to the Table 3.2.1.3-3.

If PRACK doesn't contain SDP answer, which violates SDP offer/answer model, but MGC-8 shall handle it as of existing way (note 3).

If PRACK contains SDP answer but doesn't contain preconditions lines inside SDP answer, because the previously sent 183 SDP offer contains Require:precondition, MGC-8 shall send 580 (to INVITE) to the ingress side, and send RELEASE to the egress side.

Explanation:

Note 1: MGC-8 sends UPDATE only when received SDP answer contains confirm-status of remote segment, and sends UPDATE only once to notify the far end side MGC-8 local preconditions is met. In case the far end side includes confirm-status of remote segment in 200OK UPDATE, MGC-8 just ignores it and doesn't send UPDATE again.

Note 2: Per RFC3312 and RFC4032, the SDP offer may upgrade or downgrade desired "strength-tag", and the SDP answer may upgrade desired "strength-tag" but MUST not downgrade desired "strength-tag". Since the sent 183 SDP offer contains "mandatory", MGC-8 keeps "mandatory" regardless of strength-tag in PRACK SDP answer.

Note 3: The existing behavior is: MGC-8 continues to reply 200OK PRACK w/o SDP as of existing way. In case receiving UPDATE after PRACK, MGC-8 replies

491. When MGC-8 receives ANM, MGC-8 maps it to 200OK, but MGC-8 releases call when receiving ACK to 200OK.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN
FID15068.0-1065 **SIP/SIP-I to ISUP call with/without COT and Initial INVITE w/o SDP – Receive 580 to sent UPDATE**

Requirement: **When MGC-8 receives 580 to UPDATE which was sent in FID15068.0-1060, MGC-8 shall send 580 (to INVITE) to the ingress side, and send RELEASE to the egress side.**

Explanation:

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN
FID15068.0-1070 **SIP/SIP-I to ISUP call with/without COT and Initial INVITE with/without SDP offer – Receive UPDATE**

Requirement: **Before the call is answered, no matter the preconditions have been met or not, when MGC-8 receives UPDATE with SDP offer containing preconditions attributes (note 1) which have passed checks in FID15068.0-0070, MGC-8 shall:**

- **Modify H.248 context with UPDATE SDP offer, and**
- **Update the "qos" preconditions status table of the ingress leg to the Table 3.2.1.3-1 of FID15068.0-1010, and**
- **Reply 200OK UPDATE with preconditions SDP answer based on the latest "qos" preconditions status table of the ingress leg by following rules defined in FID15068.0-0230.**

Explanation: Note 1: It's possible that the preconditions are not met until multiple UPDATE/200OK exchanges.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-1080 **SIP/SIP-I to ISUP call with/without COT and Initial INVITE with/without SDP offer – Send COT/IAM after preconditions are met**

Requirement:

Before the preconditions of the call have been met, MGC-8 shall examine whether the preconditions of local and remote segments are met at each of the following points:

- **After sending reliable 183 with SDP answer in FID15068.0-1010 or FID15068.0-1020.**
- **Exchange of PRACK and 200OK PRACK described in FID15068.0-1030 or FID15068.0-1060.**
- **Exchange of UPDATE and 200OK UPDATE described in FID15068.0-1070 or FID15068.0-1060.**

If the preconditions are met at one of the above points, MGC-8 shall send COT with "continuity check successful" for with COT call, or send IAM with "continuity check not required" for without COT call; Otherwise MGC-8 shall wait for UPDATE for preconditions and hold on sending COT/IAM until the preconditions are met or until the call setup timer expires which triggers MGC-8 to tear down the call as of the existing way.

If MGC-8 receives UPDATE and sends 200OK UPDATE after the preconditions of the call have been met, which means MGC-8 has sent COT/IAM to the egress side, MGC-8 shall not send COT/IAM any more.

Explanation:

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-1100 **SIP/SIP-I to ISUP call with/without COT and Initial INVITE with/without SDP offer – Receive ACM/CPG**

Requirement:

When MGC-8 receives the first ISUP backward message (usually ACM, maybe CPG for some ISUP variants) after sending COT/IAM in 15068.0-1080, MGC-8 shall follow the existing behaviors to interwork ACM/CPG to 18x and authorize P-Early-Media (if enabled for SIP TG, note 1), but the sent reliable 18x/200OK won't contain SDP any more because SDP offer/answer negotiation has been done during preconditions negotiation.

When MGC-8 receives subsequent CPG or ANM, MGC-8 shall follow the existing way for handling.

Explanation:

Note1:When PRFL-SIP pEarlyMediaDirn=SENDRECV, P-Early-Media direction in 18x is always sendrecv even if 180 w/o SDP. When pEarlyMediaDirn=SENDRECV&INACTIVE, P-Early-Media direction in 18x is sendrecv if there is in-band info available in ACM/CPG, otherwise is inactive.

Note 2: pEarlyMediaDirn is only applied for SIP to ISUP call as of now, so for SIP to ISDN call, P-Early-Media direction in 18x is always sendrecv.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu

History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-1110	**SIP/SIP-I to ISUP call with/without COT and Initial INVITE with/without SDP offer – Receive fast answer CON**
Requirement:	**If MGC-8 receives CON after sending COT/IAM in 15068.0-1080 and before receiving any ACM/CPG, MGC-8 shall send 200OK INVITE/200OK INVITE(CON) to the ingress side as of the existing way.**

Explanation:

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-1120	**SIP/SIP-I to ISUP call with/without COT and Initial INVITE with/without SDP offer – Receive BYE/CANCEL/RELEASE**
Requirement:	**Before call is answered, after the preconditions have been met (i.e,. IAM for without COT call or IAM+COT for with COT call has been sent to the egress side), when MGC-8 receives BYE/CANCEL from the ingress side, MGC-8 shall follow the existing way for handling, i.e., terminate the session, send 200OK BYE or 200OK CANCEL followed by 487 to the ingress side, and send RELEASE to the egress side with cause value populated as of existing way.** **Before the preconditions have been met (i.e,. for without COT call, IAM has NOT been sent to the egress side; for with COT call, IAM has been sent but COT has not been sent), when MGC-8 receives BYE/CANCEL from the ingress side, MGC-8 shall terminate the session, send 200OK BYE or 200OK CANCEL followed by 487 to the ingress side, and only when IAM has been sent for with COT call, MGC-8 shall also send RELEASE to the egress side with cause value populated as of existing way.** **Before call is answered, no matter the preconditions have been met or not, whenever MGC-8 receives RELEASE from the egress side, MGC-8 shall follow the existing way for handling, i.e., terminate the session and send 4xx-6xx (to INVITE) to the ingress side, with Reason header (if enabled) populated as of existing way.**

Explanation:

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

3.2.1.4 ISUP to SIP/SIP-I Preconditions Call

REQUIREMENT BEGIN

FID15068.0-2010 **ISUP to SIP/SIP-I call – Send INVITE with preconditions SDP offer**

Requirement:

For ISUP to SIP/SIP-I call (note 1), when the TL1 knob sipPreconds != off of PRFL-SIP/SIPT, before sending INVITE, MGC-8 shall:

- **Insert MGW for the call, and**
- **Initialize the "qos" preconditions status table of the egress leg to the Table 3.2.1.4-1:**

Table 3.2.1.4-1

Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Local	= recv	= optional	= optional
Remote	= none	= optional	= optional

- **Build preconditions SDP attributes based on the above Table 3.2.1.4-1 by following rules defined in FID15068.0-0230, and include them into INVITE SDP offer, and**
- **Include the following headers in INVITE (notes 2, 3, 4):**
  Supported:Precondition, 100Rel
  Allow: Update

Explanation:

Note 1: MGC-8 sends INVITE immediately if receiving IAM with "continuity check not required", or MGC-8 defers sending INVITE until receiving COT with "continuity check successful " if the received IAM indicates "continuity check required on this circuit" or "continuity check performed on previous circuit". The two scenarios shall be tested.

Note 2: There is cross check in TL1 to make sure sendPrack must be Y when sipPreconds != off.

Note 3: Only if P-Early-Media support is enabled in the egress SIP/SIP-I TG, INVITE contains P-Early-Media:supported.

Note 4: The outgoing INVITE would contain:
Supported:Precondition, 100Rel
Allow: UPDATE
And for a=audio media stream:
a=curr:qos local recv
a=curr:qos remote none
a=des:qos optional local sendrecv
a=des:qos optional remote sendrecv

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-2020 **ISUP to SIP/SIP-I call – Receive the first 180/183 to INVITE**

Requirement:

When MGC-8 receives the first 180/183 to INVITE (which was sent per FID15068.0-2010), if 180/183 is not reliable or doesn't contain "Allow:Update" or 180/183 SDP answer doesn't contain preconditions attributes, MGC-8 shall exit from SIP preconditions procedure and continue the call without preconditions.

Otherwise, if 180/183 is reliable and contains "Allow:Update", and its SDP answer contains preconditions attributes (which have passed checks in FID15068.0-0070), MGC-8 shall:

- **Modify H.248 context with 180/183 SDP answer, and**
- **Update the "qos" preconditions status table of the egress leg to the Table 3.2.1.4-2:**

Table 3.2.1.4-2

Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Local	= sendrecv	= "strength-tag" of desired-status of Remote Send direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged	= "strength-tag" of desired-status of Remote Recv direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged
Remote	= "direction-tag" of current-status of Local segment in SDP answer	= "strength-tag" of desired-status of Local Send direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged	= "strength-tag" of desired-status of Local Recv direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged

- **Mark the remote side requests confirmation if 180/183 SDP answer contains confirm-status of remote segment.**
- **Handle P-Early-Media header (if present) in the 180/183 following the existing way for MGW local control mode change and save P-EM value but not play local RB tone in case of P-Early-Media:inactive (note 1).**

Explanation:

Note 1: It's not expected that P-Early-Media to be present. In case it's present MGC-8 handles it as of existing way but doesn't play local RB for P-EM:inactive.

Note 2: Per RFC3312 and RFC4032, the SDP offer may upgrade or downgrade desired "strength-tag", and the SDP answer may upgrade desired "strength-tag" but MUST not downgrade desired "strength-tag". Therefore MGC-8 upgrades the "strength-tag" of a particular segment&direction only when the SDP answer upgrades the corresponding "strength-tag", otherwise keeps the existing "strength-tag". The ascending order for grade of "strength-tag" is: none < optional < mandatory.

Note 3: Per RFC, MGC-8 should receive 183 for preconditions, but in case receiving 180 with preconditions, MGC-8 still handles it for preconditions.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-2030 **ISUP to SIP/SIP-I call – Send PRACK when MGC-8 local preconditions are met and previous 180/183 SDP answer contains confirm-status of remote segment**

Requirement:

Continuing from FID15068.0-2020, if MGC-8 finds its local segment preconditions have been met based on rules defined in FID15068.0-0240, and the previous 180/183 SDP answer contains confirm-status of remote segment (i.e., the far end side requests confirmation of MGC-8 preconditions met), MGC-8 shall send PRACK with SDP offer containing preconditions attributes which are built per the latest "qos" preconditions status Table 3.2.1.4-2 in FID15068.0-2020 and rules defined in FID15068.0-0230. Otherwise MGC-8 shall send PRACK without SDP offer as of existing way.

Once MGC-8 receives 200OK PRACK with SDP answer containing preconditions attributes (which have passed checks in FID15068.0-0070), MGC-8 shall:

- **Modify H.248 context with 200OK SDP answer, and**
- **Update the "qos" preconditions status table of the egress leg to the Table 3.2.1.4-2 of FID15068.0-2020, and**
- **Check whether the preconditions of both local and remote segments are met based on rules of FID15068.0-0240, if yes, mark the preconditions of the call have been met; if not, mark the preconditions of the call "NOT met" and continue to wait for UPDATE from the egress side.**

Explanation:

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-2040 **ISUP to SIP/SIP-I call – Receive UPDATE**

Requirement:

When the call has not been answered, before/after the preconditions are met, when MGC-8 as UAC receives UPDATE with SDP offer containing preconditions attributes (note 1) which have passed checks in FID15068.0-0070, MGC-8 shall:

- **Modify H.248 context with UPDATE SDP offer, and**
- **Update the "qos" preconditions status table of the egress leg to the Table 3.2.1.4-3:**

Table 3.2.1.4-3

Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Local	= sendrecv	= mandatory (note 2)	= mandatory (note 2)
Remote	="direction-tag" of current-status of Local segment in SDP offer	= mandatory (note 2)	= mandatory (note 2)

- **Reply 200OK UPDATE with preconditions SDP answer based on the above latest "qos" preconditions status Table 3.2.1.4-3 by following rules defined in FID15068.0-0230.**

After each exchange of UPDATE/200OK UPDATE, MGC-8 shall check whether the preconditions of both local and remote segments are met based on rules of FID15068.0-0240, if yes, mark the preconditions of the call have been met, if not, mark the preconditions of the call "NOT met" and continue to wait for UPDATE from the egress side.

Explanation:

Note 1: It's possible that the preconditions are not met until multiple UPDATE/200OK exchanges.

Note 2: Per RFC3312 and RFC4032, the offer may upgrade or downgrade desired "strength-tag", and the answer may upgrade desired "strength-tag" but must not downgrade desired "strength-tag". For simplicity, it's decided that MGC-8 as answer always upgrades desired "strength-tag" to "mandatory" regardless of desired "strength-tag" in SDP offer.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:

REQUIREMENT END

REQUIREMENT BEGIN	
FID15068.0-2045	**ISUP to SIP/SIP-I call – Receive subsequent 18x before preconditions are met**
Requirement:	**Before the preconditions are met, if MGC-8 receives a subsequent 180/183 (i.e., another 180/183 after the first 180/183 to the INVITE in FID15068.0-2020), MGC-8 shall not map this 180/183, but if the 180/183 is reliable, MGC-8 shall still reply PRACK.**
Explanation:	Note 1: MGC-8 shall check the latest preconditions status to make decision whether MGC-8 shall map or not map this 180/183. Note 2: 181/182 shall still be mapped, see FID15068.0-0170.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN	
FID15068.0-2050	**ISUP to SIP/SIP-I call – Receive the first 18x after preconditions are met**
Requirement:	**For ISUP to SIP call, when MGC-8 receives the first 18x after the preconditions are met, MGC-8 shall handle it as if the first 18x received for this call, i.e., follow the existing way to handle P-Early-Media (if enabled and present), play local RB tone if needed (e.g., 18x without SDP, or 18x with P-Early-Media:inactive) and map it to ACM if ACM has not been sent yet, or CPG if ACM has been sent (note 1).** **For ISUP to SIP-I call, when MGC-8 receives the first 18x after the preconditions are met, MGC-8 shall handle it as if the first 18x received for this call, i.e., play local RB tone if needed (e.g., 18x without SDP); map it to ACM/CPG depending on SIP-I 18x message and whether ACM has been sent (note 2).** **Subsequent messages18x (which are received after the first 18x once preconditions are met) shall be handled as of existing implementation too.** **After 18x is mapped to ACM/CPG because preconditions are met, if preconditions status of the call is changed to NOT MET due to receiving UPDATE again per FID15068.0-2040 (i.e. the remote side changes its status in UPDATE), MGC-8 shall allow call proceeding and not go back to hold on the call (although MGC-8 marks preconditions status NOT MET).**
Explanation:	Note 1: ACM may have been sent because 181/182 was received prior to the first 183 for preconditions (see requirement FID15068.0-0170). Note 2: The mapping behavior shall be consistent with non-preconditions call. Assume ACM has not been sent , below is expected mapping behavior from SIPT 18x to ISUP ACM/CPG: 1. 18x(ACM) --→ ACM 2. 18x(CPG) --→CPG 3. 18x w/o ISUP body --→ACM

qQ
Components: 5060 MGC-8
References:
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-2055 **ISUP to SIP/SIP-I call – Receive 200OK INVITE/4xx-6xx/RELEASE before/after preconditions are met**

Requirement: **Before the call is answered, no matter the preconditions have been met or not:**

- **If MGC-8 receives 200OK INVITE for ISUP to SIP call, MGC-8 shall handle it as of the existing implementation, i.e., send ANM if ACM has been sent or send CON if ACM has not been sent, to the ingress side and connect the call (note 1).**
- **If MGC-8 receives 200OK INVITE(ANM) for ISUP to SIP-I call after ACM has been sent, MGC-8 shall send ANM to the ingress side and connect the call.**
- **If MGC-8 receives 200OK INVITE(ANM) for ISUP to SIP-I call before ACM has been sent, MGC-8 shall tear down the call as of existing way because ISUP layer doesn't allow ANM to be sent prior to ACM.**
- **If MGC-8 receives 200OK INVITE(CON) for ISUP to SIP-I call (no matter ACM has been sent or not), MGC-8 shall send CON to the ingress side and connect the call.**
- **If MGC-8 receives 4xx-6xx (excluding 580, which refers to FID15068.0-2060) from the egress side, MGC-8 shall handle it as of the existing implementation, i.e., send RELEASE with cause value to the ingress side and release the call.**
- **If MGC-8 receives RELEASE from the ingress side, MGC-8 shall handle it as of the existing implementation, i.e., send CANCEL (with Reason header if enabled) to the egress side and release the call.**

Explanation: Note 1: It's supposed that the downstream node shall not send 200OK INVITE until preconditions are met, but in case MGC-8 receives 200OK INVITE, MGC-8 just establishes the call as of existing way.

Components: 5060 MGC-8
References:
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-2058 **ISUP to SIP/SIP-I call – Receive 3xx to sent INVITE**

Requirement: **When MGC-8 receives 3xx to INVITE which is sent in FID15068.0-2010:**

1. **If sip3xxHandling of the egress PRFL-SIP/SIPT is RELEASE, MGC-8 shall follow the existing way to release the call.**
2. **If sip3xxHandling of the egress PRFL-SIP/SIPT is NORMAL, the new INVITE shall include precondition lines same as ones contained in previously sent INVITE.**
3. **If sip3xxHandling of the egress PRFL-SIP/SIPT is ADVANCED, after MGC-8 does routing:**
   a) **If the new egress TG is SIP/SIP-I and sets sipPreconds != off, MGC-8 shall setup preconditions call in the same way of handling a normal ISUP to SIP/SIP-I preconditions call.**
   b) **If the new egress TG is SIP/SIP-I and sets sipPreconds = off, MGC-8 shall setup the call without preconditions.**
   c) **If the new egress TG is ISUP/ISDN, MGC-8 shall setup the call as of the existing way.**

Explanation:

Components: 5060 MGC-8
References:
Owner: April Liu
History:

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-2060 **ISUP to SIP/SIP-I call – Receive 580 to sent INVITE**

Requirement: **When MGC-8 receives 580 to INVITE which was sent by MGC-8 in FID15068.0-2010, MGC-8 shall send RELEASE to the ingress side with the default cause value 127 unless the cause value can be mapped from 580 Reason header or via FAILCND configuration for 580 (note 1), and terminate the session.**

Explanation: Note 1: Following the existing logic, FAILCND configuration takes precedence over the mapping from 580 Reason header which overrides the default cause value 127.

Components: 5060 MGC-8
References:
Owner: April Liu
History:

REQUIREMENT END

REQUIREMENT BEGIN	
FID15068.0-2070	**ISUP to SIP/SIP-I call – Receive 580 to sent UPDATE**
Requirement:	**When MGC-8 receives 580 to UPDATE which was sent by MGC-8 in FID15068.0-2030, MGC-8 shall:** ● **Send BYE (note 1) to the egress side, with Reason header when Reason header is enabled. If received 580 contains Reason header, the cause value of Reason header in BYE shall be the same as received Reason header; otherwise the cause value of Reason header shall be 127. – Check if BYE/CANCEL before answer** ● **Send RELEASE to the ingress side with the default cause value 127 unless the cause value can be mapped from 580 Reason header or via FAILCND configuration for 580 (note 2).** ● **Terminate the session.**
Explanation:	Note 1: Per Q.1912.5 and 29.163, a BYE is sent. Note 2: Following the existing logic, FAILCND configuration takes precedence over the mapping from 580 Reason header which overrides the default cause value 127.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

3.2.1.5 SIP/SIP-I to SIP/SIP-I Preconditions Call with MGW

3.2.1.5.1 Common Requirements

REQUIREMENT BEGIN

FID15068.0-3000 **Rules to update the "qos" preconditions status tables when MGC-8 as UAS receives SDP offer containing preconditions attributes**

Requirement: **For SIP/SIP-I to SIP/SIP-I call with MGW (either in media-aware mode or agnostic mode), when MGC-8 as UAS receives SDP offer containing preconditions lines (which have passed checks in FID15068.0-0060/0070) from the ingress side (e.g., initial INVITE, PRACK, UPDATE), MGC-8 shall update the "qos" preconditions status tables of ingress and egress legs for each media stream requesting preconditions:**

Table 3.2.1.5.1-1

	Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Ingress	Local	= sendrecv	= "strength-tag" of desired-status of Remote Send direction in SDP offer	= "strength-tag" of desired-status of Remote Recv direction in SDP offer
	Remote	= "direction-tag" of current-status of Local segment in SDP offer	= "strength-tag" of desired-status of Local Send direction in SDP offer	= "strength-tag" of desired-status of Local Recv direction in SDP o ffer
Egress	Local	= recv upon receiving initial INVITE with SDP offer; Keep unchanged (sendrecv) for other cases	= "strength-tag" of desired-status of Local Send direction in SDP offer	= "strength-tag" of desired-status of Local Recv direction in SDP offer
	Remote	Keep unchanged or initialize to "none" upon receiving initial INVITE from the ingress	= "strength-tag" of desired-status of Remote Send direction in SDP offer	= "strength-tag" of desired-status of Remote Recv direction in SDP offer

Explanation:

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu

History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-3001 **Rules to update the "qos" preconditions status tables when MGC-8 as UAC receives SDP offer containing preconditions attributes**

Requirement: **For SIP/SIP-I to SIP/SIP-I call with MGW (either in media-aware mode or agnostic mode), when MGC-8 as UAC receives SDP offer containing preconditions lines (which have passed checks in FID15068.0-0070) from the egress side (e.g., reliable 180/183 (note 1), UPDATE), MGC-8 shall update the "qos" preconditions status tables of ingress and egress legs for each media stream requesting preconditions:**

Table 3.2.1.5.1-2

	Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Ingress	**Local**	**= recv upon receiving the first 18x with initial SDP offer from the egress; Keep unchanged (sendrecv) for other cases**	**= "strength-tag" of desired-status of Local Send direction in SDP offer**	**= "strength-tag" of desired-status of Local Recv direction in SDP offer**
	Remote	**Keep unchanged or initialize to "none" upon receiving the first reliable 18x with initial SDP offer from the egress**	**= "strength-tag" of desired-status of Remote Send direction in SDP offer**	**= "strength-tag" of desired-status of Remote Recv direction in SDP offer**
Egress	**Local**	**= sendrecv**	**= "strength-tag" of desired-status of Remote Send direction in SDP offer**	**= "strength-tag" of desired-status of Remote Recv direction in SDP offer**
	Remote	**= "direction-tag" of current-status of Local segment in SDP offer**	**= "strength-tag" of desired-status of Local Send direction in SDP offer**	**= "strength-tag" of desired-status of Local Recv direction in SDP offer**

Explanation: Note 1: This is for the scenario: SIP/SIP-I to SIP/SIP-I call with MGW and initially received INVITE has no SDP.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-3002 **Rules to update the "qos" preconditions status tables when MGC-8 as UAS receives SDP answer containing preconditions attributes**

Requirement: **For SIP/SIP-I to SIP/SIP-I call with MGW (either in media-aware mode or agnostic mode), when MGC-8 as UAS receives SDP answer containing preconditions lines (which have passed checks in FID15068.0-0070) from the ingress side (e.g., PRACK (note 1), 200OK UPDATE), MGC-8 shall update the "qos" preconditions status tables of ingress and egress legs for each media stream requesting preconditions:**

Table 3.2.1.5.1-3

	Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Ingress	**Local**	**= sendrecv**	**= "strength-tag" of desired-status of Remote Send direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged**	**= "strength-tag" of desired-status of Remote Recv direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged**
	Remote	**= "direction-tag" of current-status of Local segment in SDP answer**	**= "strength-tag" of desired-status of Local Send direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged**	**= "strength-tag" of desired-status of Local Recv direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged**
Egress	**Local**	**= Keep unchanged (sendrecv)**	**= "strength-tag" of desired-status of Local Send direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged**	**= "strength-tag" of desired-status of Local Recv direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged**
	Remote	**Keep unchanged**	**= "strength-tag" of desired-status of Remote Send direction in SDP answer if it's higher grade than the existing; otherwise keep**	**= "strength-tag" of desired-status of Remote Recv direction in SDP answer if it's higher grade than the existing; otherwise keep**

			unchanged	**unchanged**

Explanation:

Note 1: This is for the scenario: SIP/SIP-I to SIP/SIP-I call with MGW and initially received INVITE has no SDP.

Note 2: Per RFC3312 and RFC4032, the SDP offer may upgrade or downgrade desired “strength-tag”, and the SDP answer may upgrade desired “strength-tag” but MUST not downgrade desired “strength-tag”. Therefore MGC-8 upgrades the “strength-tag” of a particular segment&direction only when the SDP answer upgrades the corresponding “strength-tag”, otherwise keeps the existing “strength-tag”. The ascending order for grade of “strength-tag” is: none < optional < mandatory.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-3003 **Rules to update the "qos" preconditions status tables when MGC-8 as UAC receives SDP answer containing preconditions attributes**

Requirement: **For SIP/SIP-I to SIP/SIP-I call with MGW (either in media-aware mode or agnostic mode), when MGC-8 as UAC receives SDP answer containing preconditions lines (which have passed checks in FID15068.0-0070) from the egress side (e.g., reliable 180/183, 200OK PRACK, 200OK UPDATE), MGC-8 shall update the "qos" preconditions status tables of ingress and egress legs for each media stream requesting preconditions:**

Table 3.2.1.5.1-4

	Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Ingress	Local	= Keep unchanged (sendrecv)	= "strength-tag" of desired-status of Local Send direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged	= "strength-tag" of desired-status of Local Recv direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged
	Remote	Keep unchanged	= "strength-tag" of desired-status of Remote Send direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged	= "strength-tag" of desired-status of Remote Recv direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged
Egress	Local	= sendrecv	= "strength-tag" of desired-status of Remote Send direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged	= "strength-tag" of desired-status of Remote Recv direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged
	Remote	= "direction-tag" of current-status of Local segment in SDP answer	= "strength-tag" of desired-status of Local Send direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged	= "strength-tag" of desired-status of Local Recv direction in SDP answer if it's higher grade than the existing; otherwise keep unchanged

Explanation:	Note 1: Per RFC3312 and RFC4032, the SDP offer may upgrade or downgrade desired "strength-tag", and the SDP answer may upgrade desired "strength-tag" but MUST not downgrade desired "strength-tag". Therefore MGC-8 upgrades the "strength-tag" of a particular segment&direction only when the SDP answer upgrades the corresponding "strength-tag", otherwise keeps the existing "strength-tag". The ascending order for grade of "strength-tag" is: none < optional < mandatory.
Components:	5060 MGC-8
References:	RFC3312
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-3010	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with/without SDP Offer – Not take initiative to send UPDATE**
Requirement:	**Even if the ingress or egress far end side has included confirm-status of remote segment in SDP answer, and MGC-8 ingress or egress leg local preconditions have been met, MGC-8 shall NOT generate/send UPDATE by itself. MGC-8 shall send UPDATE only when it receives UPDATE from the ingress or egress side (refer to FID15068.0-3090, 3100)**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-3090	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with/without SDP Offer – Receive UPDATE with preconditions SDP offer from the ingress side**
Requirement:	**Before the call is answered, no matter the preconditions have been met or not, when MGC-8 receives UPDATE (from the ingress side) with SDP offer containing preconditions attributes (which have passed checks in FID15068.0-0070), MGC-8 shall handle UPDATE following FID15068.0-3230 except replacing PRACK/200OK PRACK with UPDATE/200OK UPDATE.**
Explanation:	Note 1: It's possible that preconditions are not met until multiple UPDATE/200OK UPDATE exchanges.
Components:	5060 MGC-8
References:	

Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-3100 **SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with/without SDP Offer – Receive UPDATE with preconditions SDP offer from the egress side**

Requirement:

Before the call is answered, no matter the preconditions have been met or not, when MGC-8 receives UPDATE (from the egress side) with SDP offer containing preconditions attributes (which have passed checks in FID15068.0-0070), MGC-8 shall:

- **Modify H.248 context with UPDATE SDP offer, and**
- **Update the "qos" preconditions status tables of ingress and egress legs following FID15068.0-3001, and**
- **Send UPDATE to the ingress side, with SDP offer containing preconditions lines built per the latest "qos" preconditions status table of the ingress leg in FID15068.0-3001 and rules defined in FID15068.0-0230.**

Once MGC-8 receives 200OK UPDATE with preconditions SDP answer from the ingress side, MGC-8 shall:

- **Update H.248 context with 200OK SDP answer, and**
- **Update the "qos" preconditions status tables of ingress and egress legs following FID15068.0-3002, and**
- **Send 200OK UPDATE to the egress side, with SDP answer containing preconditions attributes built per the latest "qos" preconditions status table of the egress leg in FID15068.0-3002 and rules defined in FID15068.00-0230.**

Explanation:

Components: 5060 MGC-8
References:
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN	
FID15068.0-3110	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with/without SDP Offer – Check if preconditions are met after UPDATE/200OK UPDATE**
Requirement:	**After each UPDATE (received from ingress or egress)/200OK UPDATE exchange, if MGC-8 finds that the preconditions of local and remote segments of both ingress and egress legs have been satisfied for all media streams, MGC-8 shall mark the preconditions of the call have been met.** **Otherwise, MGC-8 shall mark the preconditions of the call "NOT met" and continue to wait for UPDATE from the ingress/egress side until any response is received from the egress side in FID15068.0-3120/3125/3126 to move on the call, or until the call setup timer expires which triggers MGC-8 to tear down the call as of the existing way.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN	
FID15068.0-3120	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with/without SDP Offer – Receive subsequent 18x before/after preconditions are met**
Requirement:	**When MGC-8 receives more 18x before/after the preconditions are met, MGC-8 shall follow the existing implementation (including P-Early-Media handling) to forward 18x to the ingress side.** **For incoming SIP-I, when receiving the first subsequent 18x/18x(ACM), 18x(ACM) shall be sent to the ingress side; when receiving further subsequent 18x/18x(CPG), 18x(CPG) shall be sent to the ingress side.**
Explanation:	Note 1: It's supposed that the egress side should not send multiple 18x before preconditions are met, but in case it happens, MGC-8 just forwards 18x as of existing way. Note 2: 18x refers to 180/181/182/183.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN

FID15068.0-3125	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with/without SDP Offer – Receive BYE/CANCEL/200OK INVITE/4xx-6xx before/after preconditions are met**
Requirement:	**Before the call is answered, no matter the preconditions have been met or not, if MGC-8 receives BYE/CANCEL from the ingress side or receives 4xx-6xx to INVITE from the egress side, MGC-8 shall send the message to the other leg (with Reason header if enabled) and release the call as of existing implementation. If MGC-8 receives 200OK INVITE from the egress side, MGC-8 shall send 200OK to the ingress leg and connect the call as of the existing implementation.**
Explanation:	Note 1: It's supposed that the downstream node shall not send 200OK INVITE until the preconditions are met, but in case MGC-8 receives 200OK INVITE, MGC-8 just establishes the call as of the existing way. And also MGC-8 allows to receive 200OK INVITE right after preconditions are met without receiving 18x prior to 200OK INVITE.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-3126	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with/without SDP Offer – Receive 3xx to sent INVITE**
Requirement:	**When MGC-8 receives 3xx to INVITE which is sent in FID15068.0-3210 or 4020:** **1. If sip3xxHandling of the egress PRFL-SIP/SIPT is RELEASE, MGC-8 shall follow the existing way to release the call.** **2. If sip3xxHandling of the egress PRFL-SIP/SIPT is NORMAL, the new INVITE shall include precondition lines same as ones in previously sent INVITE.** **3. If sip3xxHandling of the egress PRFL-SIP/SIPT is ADVANCED, after MGC-8 does routing:** **a) If the new egress TG is SIP/SIP-I and sets sipPreconds != off, MGC-8 shall setup preconditions call in the same way of handling a normal SIP/SIP-I to SIP/SIP-I preconditions call.** **b) If the new egress TG is SIP/SIP-I and sets sipPreconds = off and the ingress leg requests only Supported:precondition, MGC-8 shall exit from the preconditions procedure.** **c) If the new egress TG is SIP/SIP-I and sets sipPreconds = off and the ingress leg requests Require:precondition, MGC-8 shall send 580 to the ingress side and release the call.** **d) If the new egress TG is ISUP/ISDN, MGC-8 shall setup preconditions call in the same way of handling a normal SIP/SIP-I to ISUP/ISDN preconditions call.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-3127	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with/without SDP Offer – Receive 580 to sent UPDATE/PRACK**
Requirement:	**When MGC-8 receives 580 to UPDATE which was sent by MGC-8 in FID15068.0-3090/3100, MGC-8 shall send 580 (with Reason header only if Reason header is enabled and included in received 580) to the other leg, and MGC-8 shall not release the call by itself.** **When MGC-8 receives 580 to PRACK which was sent by MGC-8 in FID15068.0-3230/3270/4040, MGC-8 shall send 200OK PRACK to the ingress side as of the existing way (note 2).**
Explanation:	Note 1: It's up to the far end side receiving 580 to make the decision. Note 2: The call will eventually fail???
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-3128	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with/without SDP Offer – Receive 580 to sent INVITE**
Requirement:	**When MGC-8 receives 580 to INVITE which was sent by MGC-8 in FID15068.0-3210/4020, MGC-8 shall send 580 (with Reason header only if Reason header is enabled and included in received 580) to the ingress leg and release the call.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN	
FID15068.0-3130	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with/without SDP Offer – Not invoke preconditions**
Requirement:	**When MGC-8 receives the first 180/183 from the egress side to INVITE which was sent in FID15068.0-3210/4020, if the previously sent INVITE has Supported:Precondition, but the 180/183 is not reliable or doesn't contain "Allow:Update" or 180/183 SDP answer/offer doesn't contain preconditions attributes, MGC-8 shall exit from SIP preconditions procedure and continue the call without preconditions, i.e., MGC-8 shall send 180/183 without preconditions attributes and without Supported/Require:precondition header to the ingress side by following the existing implementation.** **For case of initial INVITE w/o SDP, after MGC-8 exits from the preconditions procedure, MGC-8 shall make sure to insert MGW in media-aware or agnostic mode since MGW is not inserted when sending INVITE w/o SDP.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN	
FID15068.0-3140	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with/without SDP Offer – The first 180/183 doesn't contain preconditions when INVITE requires preconditions**
Requirement:	**When MGC-8 receives the first 180/183 from the egress side to INVITE which was sent in FID15068.0-3210/4020, if the previously sent INVITE has Require:Precondition, but the 180/183 is not reliable or doesn't contain "Allow:Update" or 180/183 SDP answer doesn't contain preconditions attributes, MGC-8 shall send 580 to the ingress side and send CANCEL to the egress side.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

3.2.1.5.2 SIP/SIP-I to SIP/SIP-I Preconditions Call with MGW and Initial INVITE with SDP offer

REQUIREMENT BEGIN

FID15068.0-3210	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with SDP Offer – Send INVITE with preconditions SDP offer to the egress side**

Requirement:	**For SIP/SIP-I to SIP/SIP-I call, when all of the following conditions are true:**
	1. The initial INVITE includes the option tag "precondition" in either Supported or Require header, and
	2. The initial INVITE includes the option tag "100rel" in either Supported or Require header, and
	3. The initial INVITE includes the option tag "Update" in Allow header, and
	4. The initial INVITE contains SDP offer with preconditions attributes and has passed the checks done in FID15068.0-0050 and 0060, and
	5. The TL1 knob sipPreconds != off of PRFL-SIP/SIPT for both ingress and egress SIP/SIP-I TGs, and
	6. The call requires MGW in media-aware/agnostic mode based on existing IBCF settings.
	MGC-8 shall:
	● **Insert MGW in media-aware/agnostic mode for the call, and**
	● **Update the "qos" preconditions status tables of the ingress and egress legs following FID15068.0-3000, and**
	● **Build SDP offer containing preconditions attributes which shall be based on the "qos" preconditions status table of the egress leg in FID15068.0-3000 and rules defined in 15068.0-0230.**
	● **Send INVITE with preconditions attributes and**
	  ■ **If there is at least one Mandatory strength-tag, MGC-8 shall include Require:precondition; otherwise, MGC-8 shall include Supported:precondition.**
	  ■ **Supported:100rel or Require:100rel (note 1)**
	  ■ **Allow:Update.**

Explanation:	Note 1: There is cross check in TL1 to make sure sendPrack=Y for SIP/SIP-I TG enabling preconditions, so the outgoing INVITE contains Supported/Require:100rel. For media-aware mode, the outgoing INVITE always contains Supported:100rel; For media-agnostic mode, the outgoing INVITE always contains Supported:100rel if received INVITE contains only Supported:100rel, or contains Require:100rel if received INVITE contains Require:100rel. Note 3: The outgoing INVITE contains Allow:Update by default.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN	
FID15068.0-3220	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with SDP Offer – Receive the first reliable 180/183 with preconditions SDP answer from the egress side**

Requirement:	**When MGC-8 receives the first 180/183 (from the egress side) to INVITE which was sent per FID15068.0-3210, if 180/183 is reliable and contains "Allow:Update" and its SDP answer contains preconditions attributes which have passed checks in FID15068.0-0070, MGC-8 shall:**
	● **Modify H.248 context with 180/183 SDP answer, and**
	● **Handle P-Early-Media (if present) as of existing way, and**
	● **Update the "qos" preconditions status tables of the ingress and egress legs following FID15068.0-3003, and**
	● **Send 180/183 reliably towards the ingress side, which should contain:**
	  ■ **SDP answer with preconditions attributes which shall be built per the latest "qos" preconditions status table of the ingress leg in FID15068.0-3003 and rules defined in FID15068.00-0230, and**
	  ■ **Require:100Rel and Allow:Update, and**
	  ■ **Require:precondition if at least one desired "strength-tag"of the ingress leg is mandatory; or "Supported:precondition" if all desired "strength-tags" of the ingress leg are optional/none.**

Explanation:	Note 1: Per RFC, MGC-8 should receive 183 for preconditions, but in case receiving 180 with preconditions, MGC-8 still handles it for preconditions.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN

FID15068.0-3230 **SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with SDP Offer – Receive PRACK with preconditions SDP offer from the ingress side**

Requirement:

When MGC-8 receives PRACK (from the ingress side) to 183 which was sent in FID15068.0-3220, if PRACK contains SDP offer with preconditions attributes which have passed checks in FID15068.0-0070, MGC-8 shall:

- **Modify H.248 context with PRACK SDP offer, and**
- **Update the "qos" preconditions status tables of the ingress and egress legs following FID15068.0-3000, and**
- **Send PRACK to the egress side, with SDP offer containing preconditions attributes which shall be built per the latest "qos" preconditions status table of the egress leg in FID15068.0-3000 and rules defined in FID15068.0-0230.**

Once MGC-8 receives 200OK PRACK with preconditions SDP answer from the egress side, MGC-8 shall:

- **Update H.248 context with 200OK SDP answer, and**
- **Update the "qos" preconditions status tables of the ingress and egress legs following FID15068.0-3003, and**
- **Send 200OK PRACK to the ingress side, with SDP answer containing preconditions attributes which shall be built per the latest "qos" preconditions status table of the ingress leg in FID15068.0-3003 and rules defined in FID15068.00-0230.**

After PRACK/200OK PRACK exchange, if MGC-8 finds that the preconditions of local and remote segments of both ingress and egress legs have been satisfied for all media streams (based on rules defined in FID15068.0-0240), MGC-8 shall mark the preconditions of the call have been met and be ready to receive 18x from the egress side.

Explanation:

Components: 5060 MGC-8
References:
Owner: April Liu
History:

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-3240 **SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE with SDP Offer – Receive PRACK without preconditions offer from the ingress side**

Requirement:

When MGC-8 receives PRACK (from the ingress side) to 183 which was sent in FID15068.0-3220, if PRACK doesn't contain SDP offer or doesn't contain preconditions lines in its SDP offer, MGC-8 shall handle PRACK as of existing way for SIP/SIP-I to SIP/SIP-I call, i.e., send PRACK w/o SDP or with SDP but w/o preconditions lines to the egress side.

Explanation:

Components: 5060 MGC-8
References:
Owner: April Liu

History:
REQUIREMENT END

3.2.1.5.3 SIP/SIP-I to SIP/SIP-I Preconditions Call with MGW and Initial INVITE w/o SDP offer

REQUIREMENT BEGIN	
FID15068.0-4020	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE w/o SDP – Send INVITE w/o SDP to the egress side**
Requirement:	**For SIP/SIP-I to SIP/SIP-I call, when all of the following conditions are true:** **1. The initial INVITE includes the option tag "precondition" in either Supported or Require header, and** **2. The initial INVITE includes the option tag "100rel" in either Supported or Require header, and** **3. The initial INVITE includes the option tag "Update" in Allow header, and** **4. The initial INVITE has no SDP, and** **5. The TL1 knob sipPreconds != off of PRFL-SIP/SIPT for both ingress and egress SIP/SIP-I TGs, and** **6. The call requires MGW in media-aware/agnostic mode based on existing IBCF settings.** **MGC-8 shall send INVITE w/o SDP offer (note 1), with "100rel" in Supported or Require header and with "Update" in Allow header. Besides that, MGC-8 shall include "precondition" in Supported header of the outgoing INVITE if the received INVITE has "precondition" only in Supported header, or shall include "precondition" in Require header of the outgoing INVITE if the received INVITE has "precondition" in Require header.**
Explanation:	Note 1: There is behavior change to calls requiring MGW in media-aware mode, i.e., when preconditions is requested, MGC-8 will send INVITE w/o SDP instead of with SDP, MGC-8 will insert MGW after receiving 18x with SDP offer. For calls requiring MGW in agnostic mode, there is no behavior change because the 16118.0 existing implementation inserts MGW after receiving 18x with SDP offer.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN

FID15068.0-4030 **SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE w/o SDP – Receive the first reliable 180/183 with preconditions SDP offer from the egress side**

Requirement:

When MGC-8 receives the first 180/183 to the INVITE w/o SDP which was sent in FID15068.0-4020, if the 180/183 is reliable and contains "Allow:Update" and its SDP offer contains preconditions attributes (which have passed checks in FID15068.0-0070), MGC-8 shall:

- **Insert MGW in media-aware/agnostic mode for the call, and**
- **Handle P-Early-Media (if present) as of existing way, and**
- **Update the "qos" preconditions status tables of ingress and egress legs following FID15068.0-3001, and**
- **Send reliable 180/183 towards the ingress side, which shall contain:**
  - **SDP offer containing preconditions attributes which shall be built per the "qos" preconditions status table of the ingress leg in FID15068.0-3001 and rules defined in 15068.0-0230, and**
  - **Require:100Rel and Allow:Update, and**
  - **If received 180/183 contains Supported/Require:precondition:**
    - **The sent 180/183 shall contain Supported:precondition if received 180/183 has "precondition" only in Supported header, or Require:precondition if received 18x has "precondition" in Require header.**
  - **Or if received 180/183 doesn't contain either Supported:precondition or Require:precondition:**
    - **The sent 180/183 shall contain Require:precondition if at least one desired "strength-tag" of the ingress leg is mandatory; or Supported:precondition if all of desired "strength-tags" of the ingress leg are optional/none.**

Explanation: Note 1: Per RFC, MGC-8 should receive 183 for preconditions, but in case receiving 180 with preconditions, MGC-8 still handles it for preconditions.

Components: 5060 MGC-8

References:

Owner: April Liu

History:

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-4040 **SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE w/o SDP – Receive PRACK with preconditions SDP answer from the ingress side**

Requirement:

When MGC-8 receives PRACK (from the ingress side) to 183 which was sent in FID15068.0-4030, if PRACK contains SDP answer with preconditions attributes (which have passed checks in FID15068.0-0070), MGC-8 shall:

- **Modify H.248 context with PRACK SDP answer, and**
- **Update the "qos" preconditions status tables of ingress and egress legs following FID15068.0-3002, and**
- **Send 200OK PRACK w/o SDP to the ingress side, and**
- **Send PRACK to the egress side, with SDP answer containing preconditions lines built per the latest "qos" preconditions status table of the egress leg in FID15068.0-3002 and rules defined in FID15068.0-0230.**

After PRACK/200OK PRACK exchange, if MGC-8 finds that the preconditions of local and remote segments of both ingress and egress legs have been satisfied for all media streams (based on rules defined in FID15068.0-0240), MGC-8 shall mark the preconditions of the call have been met.

Explanation:

Components: 5060 MGC-8
References:
Owner: April Liu
History:

REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-4050 **SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware/Agnostic Mode and Initial INVITE w/o SDP – Receive PRACK without preconditions attributes from the ingress side**

Requirement:

When MGC-8 receives PRACK (from the ingress side) to 183 which was sent in FID15068.0-4030, if PRACK doesn't contain SDP answer which violates SDP offer/answer model, MGC-8 current behavior is to let PRACK w/o SDP through and let somewhere fail the call, MGC-8 shall still behave in the same way.

If received PRACK contains SDP answer but doesn't contain preconditions attributes (which implies the ingress side doesn't want to invoke preconditions):

1. **If the 180/183 previously sent in FID15068.0-4030 has Supported:precondition, MGC-8 shall continue the call without preconditions – i.e., send PRACK with SDP answer without preconditions attributes to the egress side.**
2. **If the 180/183 previously sent in FID15068.0-4030 has Require:precondition, MGC-8 shall send 580 to the ingress side and send CANCEL to the egress side.**

Explanation:

Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	

REQUIREMENT END

REQUIREMENT BEGIN	
FID15068.0-4060	**SIP/SIP-I to SIP/SIP-I call with MGW in Media-Aware Mode and Initial INVITE w/o SDP – Insert MGW before sending INVITE if preconditions is not triggered**
Requirement:	**Upon receiving initial INVITE w/o SDP for SIP/SIP-I to SIP/SIP-I call requiring MGW in media-aware mode, if it's determined that SIP preconditions is not invoked for the call (any cases defined in FID15068.0-0080, 0090), MGC-8 shall still follow the existing way to insert MGW before sending INVITE and send INVITE with SDP offer.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

3.2.1.6 SIP/SIP-I to SIP/SIP-I Preconditions Call without MGW

FID15068.0-4500 **SIP/SIP-I to SIP/SIP-I call without MGW**

Requirement:

For SIP/SIP-I to SIP/SIP-I call without MGW, when all of the following conditions are true:

1. **The initial INVITE includes the option tag "Precondition" in either Supported or Require header, and**
2. **The initial INVITE includes the option tag "100Rel" in either Supported or Require header, and**
3. **The initial INVITE includes the option tag "Update" in Allow header, and**
4. **The TL1 knob sipPreconds != off of PRFL-SIP/SIPT for both ingress and egress SIP/SIP-I TGs, and**
5. **The INVITE has passed through checks in FID15068.0-0050 and 0060.**

When sending INVITE, MGC-8 shall pass through the tag "precondition" in Supported or Require header as what's received, pass through preconditions SDP attributes (if present), and include "Allow:Update" and Supported/Require:100rel (note 1).

For subsequent requests/responses (18x/PRACK/200OK PRACK/UPDATE/200OK UPDATE for preconditions), MGC-8 shall just relay received Supported/Require:precondition header (if present) and preconditions SDP attributes (if present) without change.

MGC-8 shall also save preconditions SDP attributes by following FID15068.0-4510 and 4520 (note 2).

Since no MGW is inserted for the call, MGC-8 doesn't need to check if local preconditions is met or not, and shall not take initiative to generate/send UPDATE by itself for notification of local preconditions met. MGC-8 shall send UPDATE only when it receives UPDATE from the ingress or egress side.

FID15068.0-0160 and FID15068.0-0170 are applied to SIP/SIP-I to SIP/SIP-I without MGW call.

Explanation:

Note 1: Follow the existing behavior to publish "100rel" in Supported/Require header and include "Allow:Update" in outgoing INVITE.

Note 2: Preconditions attributes are saved for re-building preconditions in case of call reroute.

Components: 5060 MGC-8
References:
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN

FID15068.0-4510 **SIP/SIP-I to SIP/SIP-I call without MGW - Rules to update the "qos" preconditions status tables when MGC-8 as UAS receives SDP offer/answer containing preconditions attributes**

Requirement: **For SIP/SIP-I to SIP/SIP-I call without MGW, when MGC-8 as UAS receives SDP offer/answer (note 1) containing preconditions lines (which have passed checks in FID15068.0-0060/0070) from the ingress side, MGC-8 shall update the "qos" preconditions status tables of ingress and egress legs for each media stream requesting preconditions:**

Table 3.2.1.6-1

	Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Ingress	**Local**	**= "direction-tag" of current-status of Remote segment in SDP**	**= "strength-tag" of desired-status of Remote Send direction in SDP (note 2)**	**= "strength-tag" of desired-status of Remote Recv direction in SDP (note 2)**
	Remote	**= "direction-tag" of current-status of Local segment in SDP**	**= "strength-tag" of desired-status of Local Send direction in SDP (note 2)**	**= "strength-tag" of desired-status of Local Recv direction in SDP (note 2)**
Egress	**Local**	**= "direction-tag" of current-status of Local segment in SDP**	**= "strength-tag" of desired-status of Local Send direction in SDP (note 2)**	**= "strength-tag" of desired-status of Local Recv direction in SDP (note 2)**
	Remote	**= "direction-tag" of current-status of Remote segment in SDP**	**= "strength-tag" of desired-status of Remote Send direction in SDP (note 2)**	**= "strength-tag" of desired-status of Remote Recv direction in SDP (note 2)**

Explanation: Note 1: Initial INVITE/PRACK/UPDATE with SDP offer, PRACK with SDP answer in case of initial INVITE w/o SDP, 200OK UPDATE with SDP answer.

Note 2: One exception is: keep existing strength tag unchanged if received SDP answer strength leg downgrades compared to existing strength tag, because RFC3312 and RFC4032 define that SDP answer should not downgrade strength tag. It's expected that remote UE should follow RFC, but in case the rainy case happens, the remote UE should be responsible for fix, MGC-8 still passes through received SDP answer preconditions attributes unchanged for w/o MGW call although MGC-8 doesn't change strength tag saved in its own table.

Components: 5060 MGC-8

References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN
FID15068.0-4520 **SIP/SIP-I to SIP/SIP-I call without MGW - Rules to update the "qos" preconditions status tables when MGC-8 as UAC receives SDP offer/answer containing preconditions attributes**

Requirement: **For SIP/SIP-I to SIP/SIP-I call without MGW, when MGC-8 as UAC receives SDP offer/answer containing preconditions lines (which have passed checks in FID15068.0-0070) from the egress side, MGC-8 shall update the "qos" preconditions status tables of ingress and egress legs for each media stream requesting preconditions:**

Table 3.2.1.6-2

	Segment	Current "direction-tag"	Desired "strength-tag" of send	Desired "strength-tag" of recv
Ingress	**Local**	**= "direction-tag" of current-status of Local segment in SDP**	**= "strength-tag" of desired-status of Local Send direction in SDP (Note 2)**	**= "strength-tag" of desired-status of Local Recv direction in SDP (Note 2)**
	Remote	**= "direction-tag" of current-status of Remote segment in SDP**	**= "strength-tag" of desired-status of Remote Send direction in SDP (Note 2)**	**= "strength-tag" of desired-status of Remote Recv direction in SDP (Note 2)**
Egress	**Local**	**= "direction-tag" of current-status of Remote segment in SDP**	**= "strength-tag" of desired-status of Remote Send direction in SDP (Note 2)**	**= "strength-tag" of desired-status of Remote Recv direction in SDP (Note 2)**
	Remote	**= "direction-tag" of current-status of Local segment in SDP**	**= "strength-tag" of desired-status of Local Send direction in SDP (Note 2)**	**= "strength-tag" of desired-status of Local Recv direction in SDP (Note 2)**

Explanation: Note 1: Reliable 18x with SDP offer in case of initial INVITE w/o SDP, reliable 18x with SDP answer, UPDATE with SDP offer, 200OK UPDATE with SDP answer, 200OK PRACK with SDP answer.

Note 2: One exception is: keep existing strength tag unchanged if received SDP answer strength leg downgrades compared to existing strength tag, because RFC3312 and RFC4032 define that SDP answer should not downgrade strength tag. It's expected that remote UE should follow RFC, but in case the rainy case happens, the remote UE should be responsible for fix, MGC-8 still passes through received SDP answer preconditions attributes unchanged for w/o MGW call although MGC-8 doesn't change strength tag saved in its own table.

Components: 5060 MGC-8
References: RFC3312
Owner: April Liu
History:
REQUIREMENT END

REQUIREMENT BEGIN
FID15068.0-4530 **SIP/SIP-I to SIP/SIP-I call without MGW – Receive 3xx to sent INVITE**

Requirement: **When MGC-8 receives 3xx to INVITE which is sent in FID15068.0-4500:**

4. **If sip3xxHandling of the egress PRFL-SIP/SIPT is RELEASE, MGC-8 shall follow the existing way to release the call.**
5. **If sip3xxHandling of the egress PRFL-SIP/SIPT is NORMAL, the new INVITE shall include precondition lines same as ones in previously sent INVITE.**
6. **If sip3xxHandling of the egress PRFL-SIP/SIPT is ADVANCED, after MGC-8 does routing:**
   a) **If the new egress TG is SIP/SIP-I and sets sipPreconds != off, MGC-8 shall setup preconditions call in the same way of handling a normal SIP/SIP-I to SIP/SIP-I preconditions call.**
   b) **If the new egress TG is SIP/SIP-I and sets sipPreconds = off and the ingress leg requests only Supported:precondition, MGC-8 shall exit from the preconditions procedure.**
   c) **If the new egress TG is SIP/SIP-I and sets sipPreconds = off and the ingress leg requests Require:precondition, MGC-8 shall send 580 to the ingress side and release the call.**
   d) **If the new egress TG is ISUP/ISDN, MGC-8 shall handle preconditions call in the same way of handling a normal SIP/SIP-I to ISUP/ISDN preconditions call.**

Explanation:

Components: 5060 MGC-8
References:
Owner: April Liu
History:
REQUIREMENT END

3.2.1.7 ISDN <-> SIP/SIP-I Preconditions Call

FID15068.0-4700	**ISDN to SIP/SIP-I Call**
Requirement:	**MGC-8 shall follow requirements (section 3.2.1.4) of ISUP to SIP/SIP-I call to handle preconditions for ISDN to SIP/SIP-I call, except using corresponding ISDN messages instead of ISUP messages.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

FID15068.0-4710	**SIP/SIP-I to ISDN Call**
Requirement:	**MGC-8 shall follow requirements (section 3.2.1.3) of SIP/SIP-I to ISUP without COT to handle preconditions for SIP/SIP-I to ISDN call, except using corresponding ISDN messages instead of ISUP messages.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

3.2.1.8 Preconditions in case of call reroute/forwarding

When MGC-8 receives call rejection/release message from the egress leg before call answer and MGC-8 has configured call reroute (e.g., REROUTE=Y in ROUTE-DIGITS, or FAILCND and TREATMENT with action REROUTE), MGC-8 will reroute the call to the 2nd egress leg.
In addition, the SCP server may trigger MGC-8 to forward a call to another destination for CFNA/CFB etc. services.

FID15068.0-7010	**Incoming ISUP/ISDN call rerouted/forwarded to SIP/SIP-I**
Requirement:	**When an incoming ISUP/ISDN call is rerouted/forwarded to the 2nd egress leg which is SIP/SIP-I, if the TL1 knob sipPreconds != off of egress PRFL-SIP/SIPT, MGC-8 shall clean previous egress leg "qos" preconditions status table if it exists, and trigger preconditions negotiation on the 2nd egress leg in the same way as a non-rerouted ISUP/ISDN to SIP/SIP-I call, i.e., following 3.2.1.4 requirements.** **If the TL1 knob sipPreconds = off of egress PRFL-SIP/SIPT, MGC-8 shall setup the call without preconditions as of the existing way.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu

History:	
REQUIREMENT END	

FID15068.0-7020	Incoming SIP/SIP-I call rerouted/forwarded to ISUP/ISDN
Requirement:	**When an incoming SIP/SIP-I call is rerouted/forwarded to the 2nd egress leg which is ISUP/ISDN:** **1. If the call before reroute (note 1) has NOT invoked preconditions and has done offer/answer negotiation (e.g., has sent 18x to the ingress side), MGC-8 shall continue the rerouted call without preconditions as of the existing way.** **2. If the call before reroute (note 1) has NOT done offer/answer negotiation (i.e., has NOT sent 18x to the ingress side):** ■ **if the initial INVITE and the ingress TG match the requirement of triggering preconditions defined in FID15068.0-1010/1020/1040/1050, MGC-8 shall handle the rerouted SIP/SIP-I to ISUP/ISDN call with preconditions by following 3.2.1.3 requirements;** ■ **otherwise, MGC-8 shall continue the rerouted call without preconditions.** **3. If the call before reroute (note 1) has invoked preconditions and has exchanged SDP offer/answer for preconditions, MGC-8 shall follow FID15068.0-7025/7028/7030 for handling.**
Explanation:	Note 1: The 1st call could be: SIP/SIP-I to ISUP/ISDN preconditions call, or SIP/SIP-I to SIP/SIP-I with/without MGW preconditions call.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

<table>
<tr><td>FID15068.0-7025</td><td>Incoming SIP/SIP-I call rerouted/forwarded to ISUP/ISDN - the call before reroute has invoked preconditions and exchanged SDP offer/answer at ingress leg for preconditions</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Requirement:</td><td>When an incoming SIP/SIP-I call is rerouted/forwarded to the 2nd egress leg which is ISUP/ISDN, the call before reroute has invoked preconditions and exchanged SDP offer/answer for preconditions (no mater met or not met), there are 3 cases:
Case 1: There is no MGW inserted before reroute.
Case 2: There is MGW inserted before reroute but ingress termination is changed after reroute.
Case 3: There is MGW inserted before reroute and ingress termination is not changed after reroute.

For any cases, MGC-8 shall:
■ Insert MGW as of the existing way if needed, and
■ Only for egress ISUP with COT call, send IAM with "continuity check performed on this call" (note 1) and perform the continuity test on the egress termination, and
■ Update the “qos” preconditions status table of the ingress leg as below, and check if the ingress leg preconditions have been met based on the following table – if met, go to FID15068.0-7028, if not met, go to FID15068.0-7030:
Table 3.2.1.8-1
<table>
<tr><td></td><td>Segment</td><td>Current “direction-tag”</td><td>Desired “strength-tag” of send</td><td>Desired “strength-tag” of recv</td></tr>
<tr><td rowspan="2">Ingress</td><td>Local</td><td>= sendrecv</td><td>Keep unchanged</td><td>Keep unchanged</td></tr>
<tr><td>Remote</td><td>Keep unchanged</td><td>Keep unchanged</td><td>Keep unchanged</td></tr>
</table></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Explanation:</td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Components:</td><td>5060 MGC-8</td></tr>
<tr><td>References:</td><td></td></tr>
<tr><td>Owner:</td><td>April Liu</td></tr>
<tr><td>History:</td><td></td></tr>
<tr><td>REQUIREMENT END</td><td></td></tr>
</table>

FID15068.0-7028	**Incoming SIP/SIP-I call rerouted/forwarded to ISUP/ISDN – the ingress leg preconditions are met**
Requirement:	**If the ingress leg preconditions have been met:** ● **For egress ISUP with COT call, send COT with "continuity check successful"once continuity check is successfully done.** ● **For egress ISUP without COT call, send IAM with "continuity check not required".** ● **For egress ISDN call, send SETUP.** **For incoming SIP, upon receiving backward response messages (e.g., ACM/CPG for ISUP, Alerting for ISDN, etc.) from the 2nd egress side, MGC-8 shall follow the existing reroute call flow for mapping.** **For incoming SIP-I:** ● **For cases 1 and 2 (ingress termination is changed after reroute) in FID15068.0-7025, when receiving the first backward response message (e.g., ACM for ISUP, Alerting for ISDN) from the 2nd egress side:** ■ **if 18x(ACM) has not been sent to the ingress side before reroute, MGC-8 shall map to UPDATE with SDP followed by 18x(ACM) w/o SDP towards the ingress side. Subsequent backward response messages will be mapped to 18x(CPG) w/o SDP.** ■ **if 18x(ACM) has been sent to the ingress side before reroute, MGC-8 shall map to UPDATE with SDP towards the ingress side. Subsequent backward response messages will not be mapped (this is the existing reroute behavior).** ● **For case 3 (ingress termination is NOT changed after reroute) in FID15068.0-7025, when receiving the first backward response message (e.g., ACM for ISUP, Alerting for ISDN) from the 2nd egress side:** ■ **if 18x(ACM) has not been sent to the ingress side, MGC-8 shall map to 18x(ACM) w/o SDP towards the ingress side.** ■ **if 18x(ACM) has been sent to the ingress side, MGC-8 shall send 18x(CPG) w/o SDP as of existing way.** ■ **Subsequent backward response messages from the 2nd egress side will be mapped to 18x(CPG) w/o SDP as of existing way.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

FID15068.0-7030	**Incoming SIP/SIP-I call rerouted/forwarded to ISUP/ISDN – the ingress leg preconditions are NOT met**
Requirement:	**If the ingress leg remote preconditions have NOT been met, MGC-8 shall not send COT(for egress ISUP with COT call)/IAM(for egress ISUP without COT call)/SETUP right away to the egress side. Once MGC-8 receives UPDATE from the ingress side to indicate ingress remote preconditions are met, go to FID15068.0-7028.**
Explanation:	

Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

FID15068.0-7040	**Incoming SIP/SIP-I call rerouted/forwarded to SIP/SIP-I**
Requirement:	**When an incoming SIP/SIP-I call is rerouted/forwarded to the 2nd egress leg which is SIP/SIP-I:** **1. If the call before reroute has NOT invoked preconditions and has done offer/answer negotiation (e.g., has sent 18x to the ingress side), MGC-8 shall continue the rerouted call without preconditions as of the existing way, regardless of the setting of 2nd egress SIP/SIP-I trunk group sipPreconds.** **2. If the call before reroute has invoked preconditions and has exchanged SDP offer/answer for preconditions but the 2nd egress SIP/SIP-I trunk group sets sipPreconds = off, MGC-8 shall continue the rerouted call without preconditions as of the existing way, and not include preconditions SDP for messages sent to the ingress leg.** **3. If the call before reroute has invoked preconditions and has exchanged SDP offer/answer for preconditions and the 2nd egress SIP/SIP-I trunk group sets sipPreconds != off, MGC-8 shall follow FID15068.0-7050/7110 for handling of different scenarios.** **4. If the call before reroute has NOT done offer/answer negotiation (e.g., has NOT sent 18x to the ingress side):** **● if the initial INVITE and the ingress&new egress trunk groups match the requirement of triggering preconditions defined in FID15068.0-3210/4020/4500, MGC-8 shall handle the rerouted SIP/SIP-I to SIP/SIP-I call with preconditions by following 3.2.1.5 (with MGW) or 3.2.1.6 (without MGW) requirements;** **● if the new egress SIP/SIP-I TG sets sipPreconds=off and the initial INVITE has Require:precondition, MGC-8 shall send 580 to the ingress leg and release the call;** **● otherwise, MGC-8 shall continue the rerouted call without preconditions (note 1).**

Explanation:	Note 1: Cases include:
	a) The new egress SIP/SIP-I TG has sipPreconds=off and initial INVITE has Supported:precondition;
	b) The original ingress SIP/SIP-I TG has sipPreconds=off;
	c) The initial INVITE doesn't request preconditions.

Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

FID15068.0-7050	**Incoming SIP/SIP-I call rerouted/forwarded to SIP/SIP-I and there is NO MGW after reroute – Send INVITE without SDP to the egress side**
Requirement:	**When an incoming SIP/SIP-I call is rerouted/forwarded to the 2nd egress leg which is SIP/SIP-I:** ● **if the 1st call has invoked preconditions and exchanged SDP offer/answer for preconditions between calling and called parties, and** ● **if the 2nd egress SIP/SIP-I trunk group sets sipPreconds != off, and** ● **if there is NO MGW after reroute (note 1).** **MGC-8 shall clean the "qos" preconditions tables of ingress and egress legs, send INVITE w/o SDP to the 2nd egress leg, containing "Supported:precondition", "Allow:Update" and declaring "100rel" in Supported/Require header (based on received initial INVITE).** **When receiving the first 180/183 with SDP offer, MGC-8 shall send UPDATE to the ingress side, with precondition tag in Supported/Require header and SDP offer (including preconditions lines if received) same as what are received in 180/183. When receiving 200OK UPDATE with SDP answer, MGC-8 shall send PRACK to the egress side, with SDP answer (including preconditions lines if received) same as what are received in 200OK UPDATE.** **Refer to Figures 11, 12 and 13 for call flows.** **MGC-8 shall handle other cases in the same way of a non-rerouted SIP/SIP-I to SIP/SIP-I call without MGW (refer to FID15068.0-4500, 4510, 4520, 4530).**
Explanation:	Note 1: The call before reroute may have inserted MGW or not inserted MGW and the re-routed call is SIP/SIP-I to SIP/SIP-I without MGW, MGC-8 follows the existing way to subtract MGW which was inserted before reroute.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

<table>
<tr><td>FID15068.0-7110</td><td>Incoming SIP/SIP-I call rerouted/forwarded to SIP/SIP-I and there is MGW after reroute – Send INVITE with SDP offer to the egress side</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Requirement:</td><td>When an incoming SIP/SIP-I call is rerouted/forwarded to the 2nd egress leg which is SIP/SIP-I:
● if the call before reroute has invoked preconditions and exchanged SDP offer/answer for preconditions between calling and called parties, and
● if there is MGW after reroute (note 1), and
● if the 2nd egress SIP/SIP-I trunk group sets sipPreconds != off.

MGC-8 shall update the egress leg “qos” preconditions status table as below:
Table 3.2.1.8-3
<table>
<tr><th></th><th>Segment</th><th>Current “direction-tag”</th><th>Desired “strength-tag” of send</th><th>Desired “strength-tag” of recv</th></tr>
<tr><td>Egress</td><td>Local</td><td>= Recv</td><td>= Desired “strength-tag” of Ingress leg Remote Send</td><td>= Desired “strength-tag” of Ingress leg Remote Recv</td></tr>
<tr><td></td><td>Remote</td><td>= None</td><td>= Desired “strength-tag” of Ingress leg Local Send</td><td>= Desired “strength-tag” of Ingress leg Local Recv</td></tr>
</table>
MGC-8 shall send INVITE with SDP offer containing preconditions lines built per the above table and rules of FID15068.0-0230. If there is at least one Mandatory strength-tag, MGC-8 shall include Require:precondition; otherwise, MGC-8 shall include Supported:precondition.</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Explanation:</td><td>Note 1: This requirement covers 3 cases:
■ Case a - There is MGW inserted before reroute and the ingress termination is kept after reroute.
■ Case b - There is MGW inserted before reroute and the reroute call actually doesn’t require MGW but the MGW is removed after call answer - the route advance “reroute=Y” behaves in this way.
■ Case c - There is MGW inserted before reroute and the ingress termination is changed after reroute because new MGW is inserted.
■ Case d - There is NO MGW inserted before reroute, and there is MGW inserted after reroute.</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Components:</td><td>5060 MGC-8</td></tr>
<tr><td>References:</td><td></td></tr>
<tr><td>Owner:</td><td>April Liu</td></tr>
<tr><td>History:</td><td></td></tr>
<tr><td>REQUIREMENT END</td><td></td></tr>
</table>

FID15068.0-7120	**Incoming SIP/SIP-I call rerouted/forwarded to SIP/SIP-I and there is MGW inserted after reroute – Receive the first 180/183 from the egress side**
Requirement:	**Continuing from FID15068.0-7110, when MGC-8 receives the first 180/183 to INVITE:** ● **If sent INVITE contains "Supported:preconditions", and if 180/183 is not reliable or doesn't contain "Allow:Update" or SDP answer doesn't contain preconditions attributes, MGC-8 shall exit from SIP preconditions procedure and continue rerouted call setup without preconditions.** ● **If sent INVITE contains "Require:preconditions", and if 180/183 is not reliable or doesn't contain "Allow:Update" or SDP answer doesn't contain preconditions attributes, MGC-8 shall send CANCEL to the egress side and send 580 to the ingress side.** ● **If 180/183 is reliable and contains "Allow:Update", and its SDP answer contains preconditions attributes (which have passed checks in FID15068.0-0070):** ■ **For the case that media-aware ingress termination is not changed after reroute and MGC-8 doesn't owe an UPDATE to the ingress remote side for local preconditions status update, MGC-8 shall not map this 180/183 to the ingress side. MGC-8 shall modify H.248 context with 180/183 SDP answer, and update the "qos" preconditions status table of the ingress and egress legs following FID15068.0-3003. If the received 180/183 contains Confirm-status, MGC-8 shall directly reply PRACK with preconditions SDP offer to the egress side; otherwise, MGC-8 shall reply PRACK without SDP.** ■ **For other cases (note 1), MGC-8 shall follow FID15068.0-3220 except that MGC-8 shall send UPDATE with SDP offer containing preconditions to the ingress side instead of 180/183. When receiving 200OK UPDATE with SDP answer containing preconditions line from the ingress side, MGC-8 shall follow FID15068.0-3002 for handling and send PRACK to the egress side. If the received 180/183 contains Confirm-status, MGC-8 shall send PRACK with preconditions SDP offer; otherwise, MGC-8 shall send PRACK without SDP** ■ **For any cases, MGC-8 shall follow FID15068.0-3090, 3110, 3120, 3125, 3126, 3127, 3128 for subsequent cases handling.**
Explanation:	Note 1: Other cases include: a) ingress termination is changed after reroute (no matter media aware or agnostic) – UPDATE is sent to the ingress in existing reroute logic; b) ingress termination is not changed after reroute but it's media agnostic call – UPDATE is sent to the ingress in existing reroute logic; c) media-aware call, ingress termination is not changed but initial received INVITE was w/o SDP and the ingress remote UE required confirm-status in PRACK answer and MGC-8 hasn't sent UPDATE for local preconditions status update when reroute happens.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

FID15068.0-7140	**Incoming SIP/SIP-I call rerouted/forwarded to SIP/SIP-I – Receive UPDATE from the ingress before 2nd egress leg offer/answer done**
Requirement:	**When MGC-8 receives UPDATE with SDP preconditions from the ingress side before the egress leg INVITE/18x offer/answer exchange is done:** ● **If there is MGW after reroute, MGC-8 shall reply 200OK UPDATE with SDP preconditions directly.** ● **If there is no MGW after reroute, MGC-8 shall reply 491.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN	
FID15068.0-7200	**Incoming SIP-I call rerouted/forwarded to SIP – 18x(ACM/CPG) sent to the ingress leg**
Requirement:	**For reroute cases defined in FID15068.0-7050/7110 while incoming leg is SIP-I and 2nd egress leg is SIP, after the 2nd egress SIP leg has done preconditions negotiation, when receiving subsequent 18x from the 2nd egress SIP leg:** ● **if 18x(ACM) has never been sent to the ingress SIP-I leg (before/after reroute), MGC-8 shall send 18x(ACM) to the ingress SIP-I leg.** ● **if 18x(ACM) has been sent to the ingress SIP-I leg (before/after reroute), MGC-8 shall send 18x(CPG) to the ingress SIP-I leg.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

REQUIREMENT BEGIN	
FID15068.0-7210	**Incoming SIP-I call rerouted/forwarded to SIP-I – 18x(ACM/CPG) sent to the ingress leg**
Requirement:	**For reroute cases defined in FID15068.0-7050/7110 while incoming leg is SIP-I and 2nd egress leg is SIP-I, after the 2nd egress SIP-I leg has done preconditions negotiation (i.e., 183 for preconditions), when receiving 18x(ACM) from the 2nd SIP-I leg:** ● **if 18x(ACM) has never been sent to the ingress SIP-I leg (before/after reroute), MGC-8 shall send 18x(ACM) to the ingress SIP-I leg.** ● **if 18x(ACM) has been sent to the ingress SIP-I leg (before/after reroute), MGC-8 shall send 18x(CPG) to the ingress SIP-I leg (following the existing behavior).** **When receiving subsequent 18x(CPG) from the 2nd SIP-I leg, MGC-8 shall send 18x(CPG) to the ingress SIP-I leg.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

3.2.1.9 Interaction with other features

FID15068.0-8010	**Interaction with forking**
Requirement:	**1. When PRFL-SIP/SIPT sipPreconds = ON_NOFORK, the outgoing INVITE/INVITE(IAM) shall contain Request-Disposition: no-fork for ISDN/ISUP/SIP/SIP-I to SIP/SIP-I call.** **2. When PRFL-SIP/SIPT sipPreconds = off or ON_FORK:** **A) For ISUP to SIP call, the outgoing INVITE shall contain Request-Disposition: fork, parallel (the existing behavior).** **B) For ISUP to SIP-I call and SIP/SIP-I to SIP/SIP-I (except the bullet 3) call, the outgoing INVITE/INVITE(IAM) shall contain Request-Disposition: fork, sequential (the existing behavior).** **3. For SIP/SIP-I to SIP/SIP-I call with MGW in agnostic call and initial INVITE w/o SDP, and for ISDN to SIP/SIP-I call, the outgoing INVITE/INVITE(IAM) shall contain Request-Disposition: no-fork (the existing behavior), regardless of the value of PRFL-SIP/SIPT sipPreconds.** **No matter in which configuration, when MGC-8 detects preconditions and forking happen at the same time, MGC-8 shall terminate the call since MGC-8 doesn't support preconditions for forking calls.**
Explanation:	
Components:	5060 MGC-8

References:	
Owner:	April Liu
History:	
REQUIREMENT END	

FID15068.0-8020	**Interaction with LI**
Requirement:	**For SIP/SIP-I to ISUP without COT preconditions call, MGC-8 shall send X2 messages only when IAM is sent since MGC-8 defers sending IAM until the preconditions are met.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

FID15068.0-8030	**Interaction with SIP FED**
Requirement:	**There shall have testing to verify, when SIP FED is enabled, all scenarios of SIP/SIP-I to SIP/SIP-I, SIP/SIP-I <-> ISUP/ISDN preconditions calls work normally.**
Explanation:	Note 1: Refer to 16720.0 and 16897.0.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

FID15068.0-8040	**Interaction with A-A GR**
Requirement:	**There shall have testing to verify, when inter-MGC or intra-MGC overflow happens for SIP/SIP-I to SIP/SIP-I, SIP/SIP-I <-> ISUP/ISDN call in A-A GR configuration, all scenarios of preconditions shall work normally.**
Explanation:	Note 1: Need to test all overflow cases, refer to 14716.0 and 15068.0.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

FID15068.0-8060	**Interaction with media and signaling CAC**
Requirement:	**All requirements for preconditions shall be applied only for calls which have passed media and signaling call admission control.**
Explanation:	
Components:	5060 MGC-8

References:	
Owner:	April Liu
History:	
REQUIREMENT END	

FID15068.0-8070	**Interaction with early ACM**
Requirement:	**For ingress ISUP/SIPT call with preconditions, if early ACM timer is set (TRKGRP acmTMR), when the timer fires:** ● **If the preconditions of the call has been met and wait for called party's backward message (i.e., ACM has not been sent to the ingress side), MGC-8 shall send early ACM as of the existing way.** ● **If the preconditions of the call has not been met, MGC-8 shall delay sending early ACM until the preconditions is met.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

FID15068.0-8080	**Interaction with IN triggered CRBT**
Requirement:	**For a CRBT call, MGC-8 shall not do preconditions on both CRBT leg and called party leg.**
Explanation:	FID1697 CRBT feature allows MGC-8 to connect a CRBT server before connecting with the real called party, this service is triggered by IN service, and is being used only by Sprint, but Sprint is going to move this feature from MGC-8 in their evolution plan.
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	
REQUIREMENT END	

3.2.2 Signaling

N/A.

3.3 Signaling Gateway Requirements

3.3.1 Message Processing

N/A.

3.3.2 Signaling

N/A.

3.4 Network Gateway Requirements

3.4.1 Call Processing

N/A.

3.4.2 Signaling

N/A.

3.4.3 VoIP Bearer Network

N/A.

3.4.4 Voice Quality

N/A.

3.5 OAM&P Requirements

3.5.1 Faults and Alarms

N/A.

3.5.2 Configuration

REQUIREMENT BEGIN

FID15068.0-9010	**PRFL-SIP/SIPT**
Requirement:	**MGC-8 shall add one TL1 knob (e.g., sipPreconds) in PRFL-SIP/SIPT to identify whether SIP preconditions is supported, its value can be:** • **OFF - SIP preconditions support is not enabled. It's the default value.** • **ON_FORK – SIP preconditions support is enabled when the associated SIP/SIPT TG is the ingress or egress TG for a call. In addition, when the TG is the egress side, besides publishing "precondition" tag in Supported/Require header, MGC-8 also publishes forking tag in Request-Disposition header as of existing way. For example, for ISUP to SIP call, the outgoing INVITE would contain Request-Disposition: fork, parallel; for ISUP to SIPT call and SIP/SIPT to SIP/SIPT call, the outgoing INVITE would contain Request-Disposition: fork, sequential. Note MGC-8 actually doesn't support SIP preconditions and forking at the same time, it terminates the call when receiving forked response while SIP preconditions procedure is undergoing. Therefore this value is used only when the downstream node doesn't trigger both at the same time, The MGC-8 relies on the downstream node to remove Supported:preconditions or Require:precondition when it invokes a feature that uses forking.** • **ON_NOFORK - SIP preconditions support is enabled when the associated SIP/SIPT TG is the ingress or egress TG for a call. In addition, the INVITE outgoing over this TG would always contain Request-Disposition: no-fork.** **This knob can be set to ON_FORK or ON_NOFORK only when sendPrack of PRFL-SIP/SIPT is Y.** **The sendPrack of PRFL-SIP/SIPT can be set to N only when this knob is off.**
Explanation:	
Components:	5060 MGC-8
References:	
Owner:	April Liu
History:	

REQUIREMENT END

3.5.3 Accounting

N/A.

3.5.4 Performance Measurements

N/A.

3.5.5 Security

N/A.

3.5.6 Software Upgrade

3.5.7 Maintainability

3.6 Capacity & Performance Requirements

N/A.

3.7 Reliability & Availability Requirements

N/A.

4. Future Considerations

N/A.

5. Glossary

N/A.

6. References

1. ROM of 15068.0: QDI49342 http://www-qdi.lucent.com/qms2/search/wwwcompas4.php/49342.pdf?prodid=49342&version=-1&dformat=pdf&txttype=msword&cstatus=