

IMS Originating to PSTN ISUP Call (IMS-PSTN(ISUP) Call; Megaco/H.248 Signaling; IMS Caller Initiated Call Release)						
Calling UE	IMS Core Network		PSTN Interface			EventStudio System Designer 4.0
Caller User Equipment	Visited IMS	Home IMS	Signaling		Media	25-Feb-08 08:08 (Page 1)
Caller	Orig P-CSCF	Orig S-CSCF	BGCF	MGCF	IM-MGW	

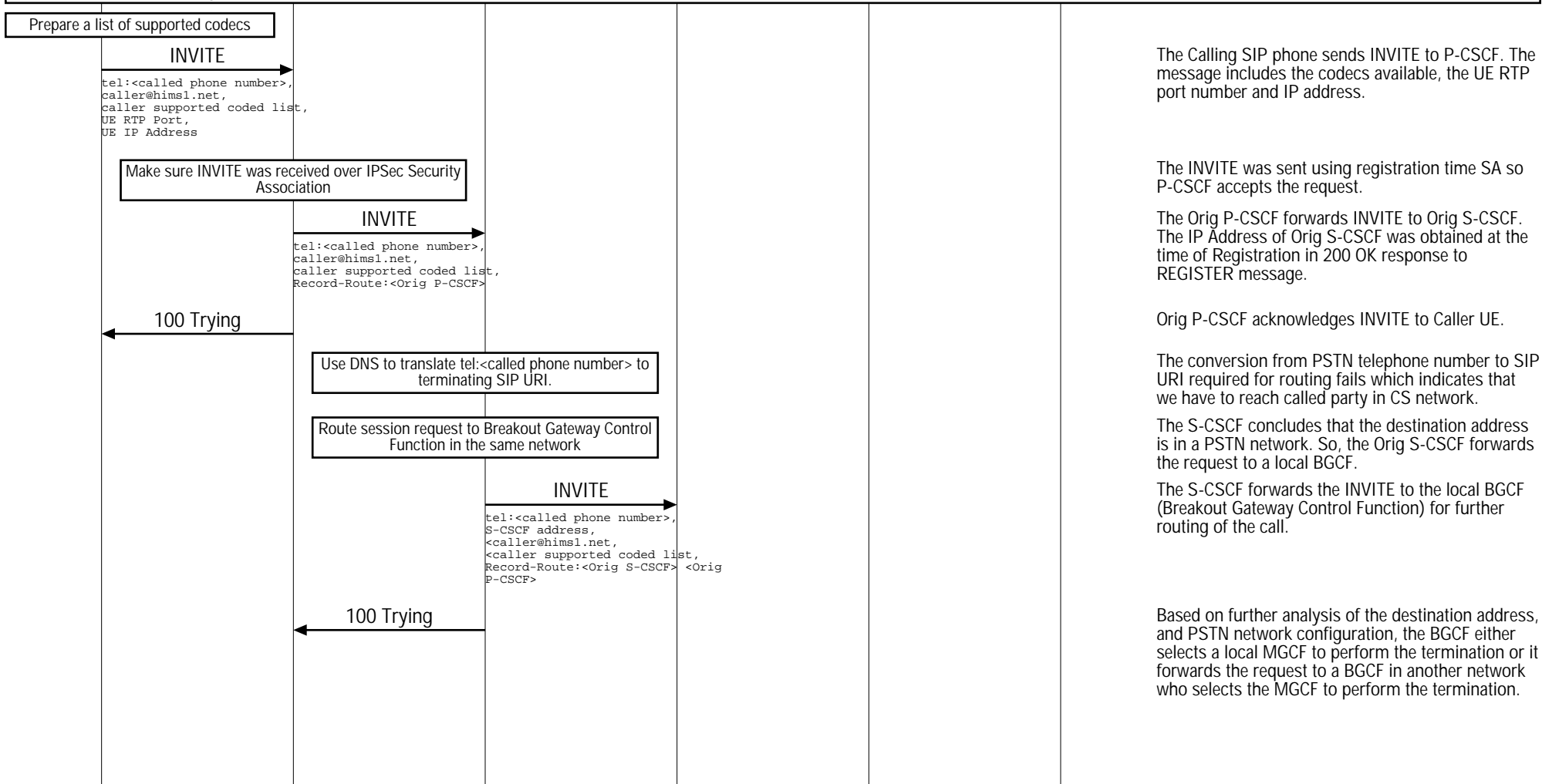
LEG: Detailed IMS to PSTN(ISUP) Call Setup

This sequence diagram was generated with EventStudio System Designer 4.0 (<http://www.EventHelix.com/EventStudio>). Copyright © 2008 EventHelix.com Inc. All Rights Reserved. The EventStudio source files for this document can be downloaded from <http://www.eventhelix.com/call-flow/ims-pstn-call.zip>.

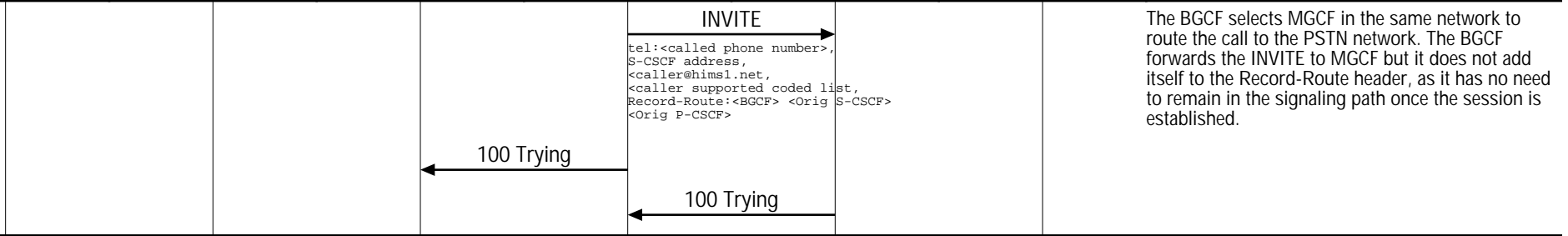
This call flow describes the call setup from one IMS subscriber to ISUP PSTN termination. The call is routed via the BGCF (Border Gateway Control Function) to the MGCF (Media Gateway Control Function). The MGCF uses one context with two terminations in IM-MGW (Media Gateway). The termination RTP1 is used towards IMS Core network subsystem entity and the bearer termination TDM1 is used for bearer towards PSTN CS network element.



### IMS to PSTN Call Routing via BGCF

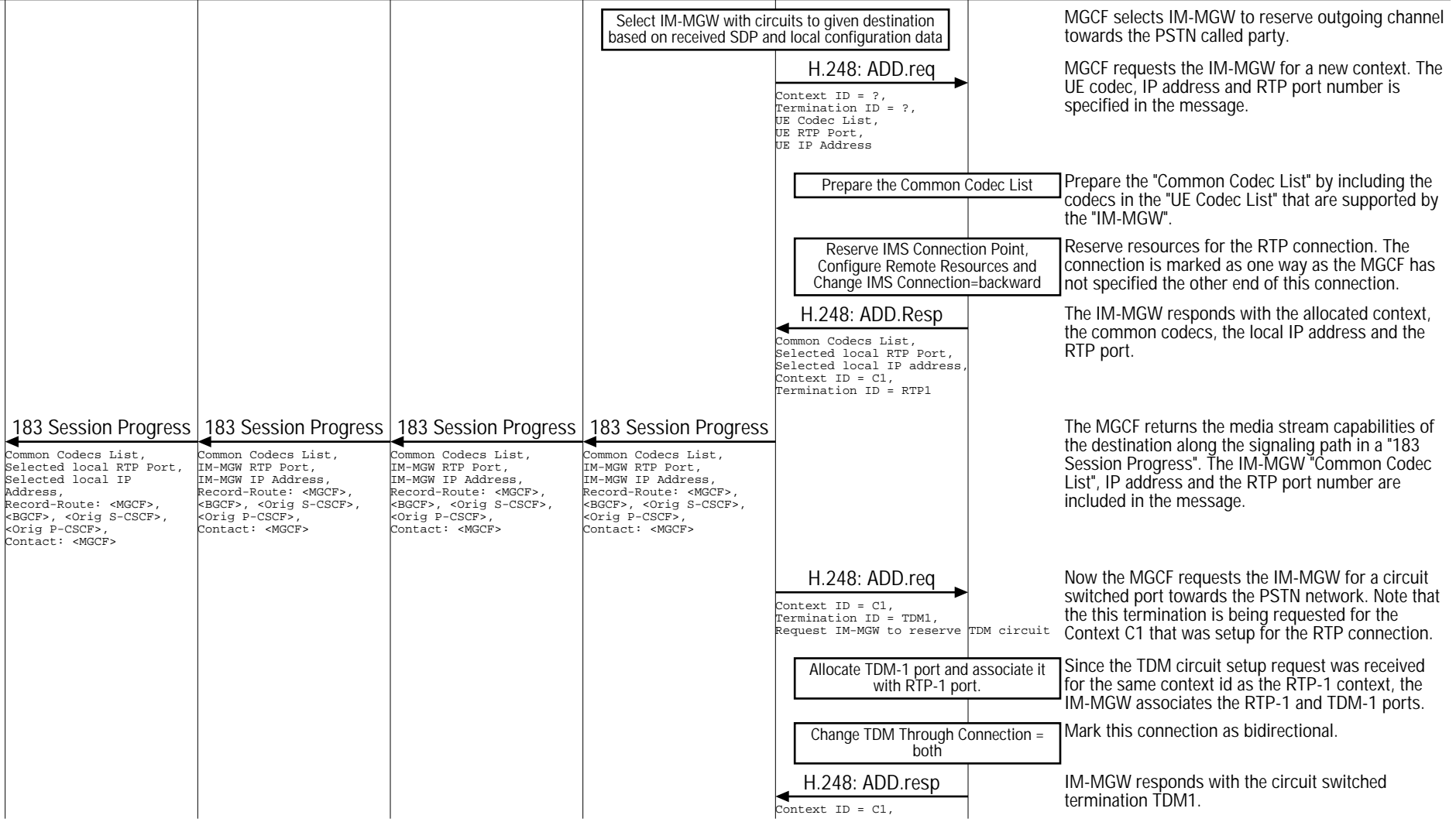


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The BGCF selects MGCF in the same network to route the call to the PSTN network. The BGCF forwards the INVITE to MGCF but it does not add itself to the Record-Route header, as it has no need to remain in the signaling path once the session is established.

**IM-MGW Initial Setup**



MGCF selects IM-MGW to reserve outgoing channel towards the PSTN called party.

MGCF requests the IM-MGW for a new context. The UE codec, IP address and RTP port number is specified in the message.

Prepare the "Common Codec List" by including the codecs in the "UE Codec List" that are supported by the "IM-MGW".

Reserve resources for the RTP connection. The connection is marked as one way as the MGCF has not specified the other end of this connection.

The IM-MGW responds with the allocated context, the common codecs, the local IP address and the RTP port.

The MGCF returns the media stream capabilities of the destination along the signaling path in a "183 Session Progress". The IM-MGW "Common Codec List", IP address and the RTP port number are included in the message.

Now the MGCF requests the IM-MGW for a circuit switched port towards the PSTN network. Note that the this termination is being requested for the Context C1 that was setup for the RTP connection.

Since the TDM circuit setup request was received for the same context id as the RTP-1 context, the IM-MGW associates the RTP-1 and TDM-1 ports.

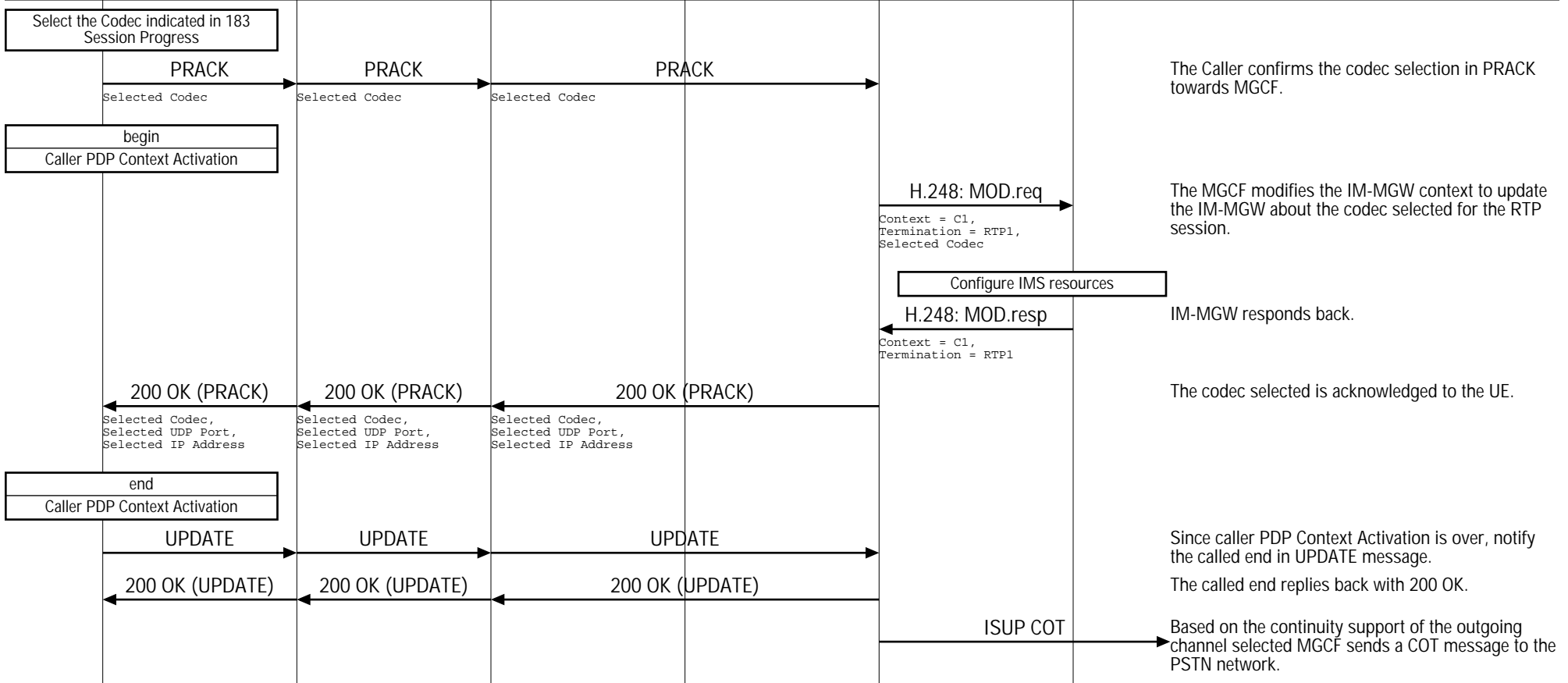
Mark this connection as bidirectional.

IM-MGW responds with the circuit switched termination TDM1.

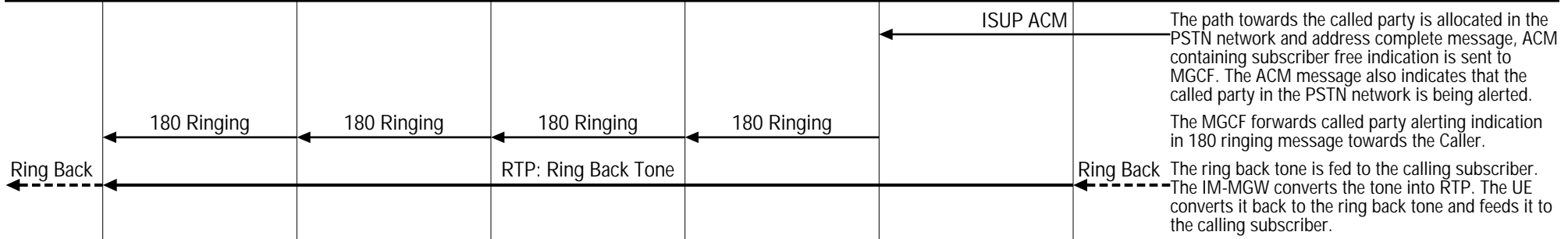
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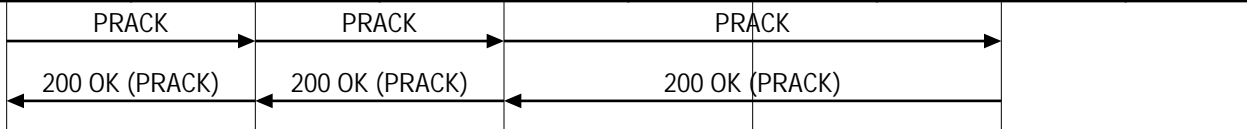
**Caller Media PDP Context Activation**



**Ringling**

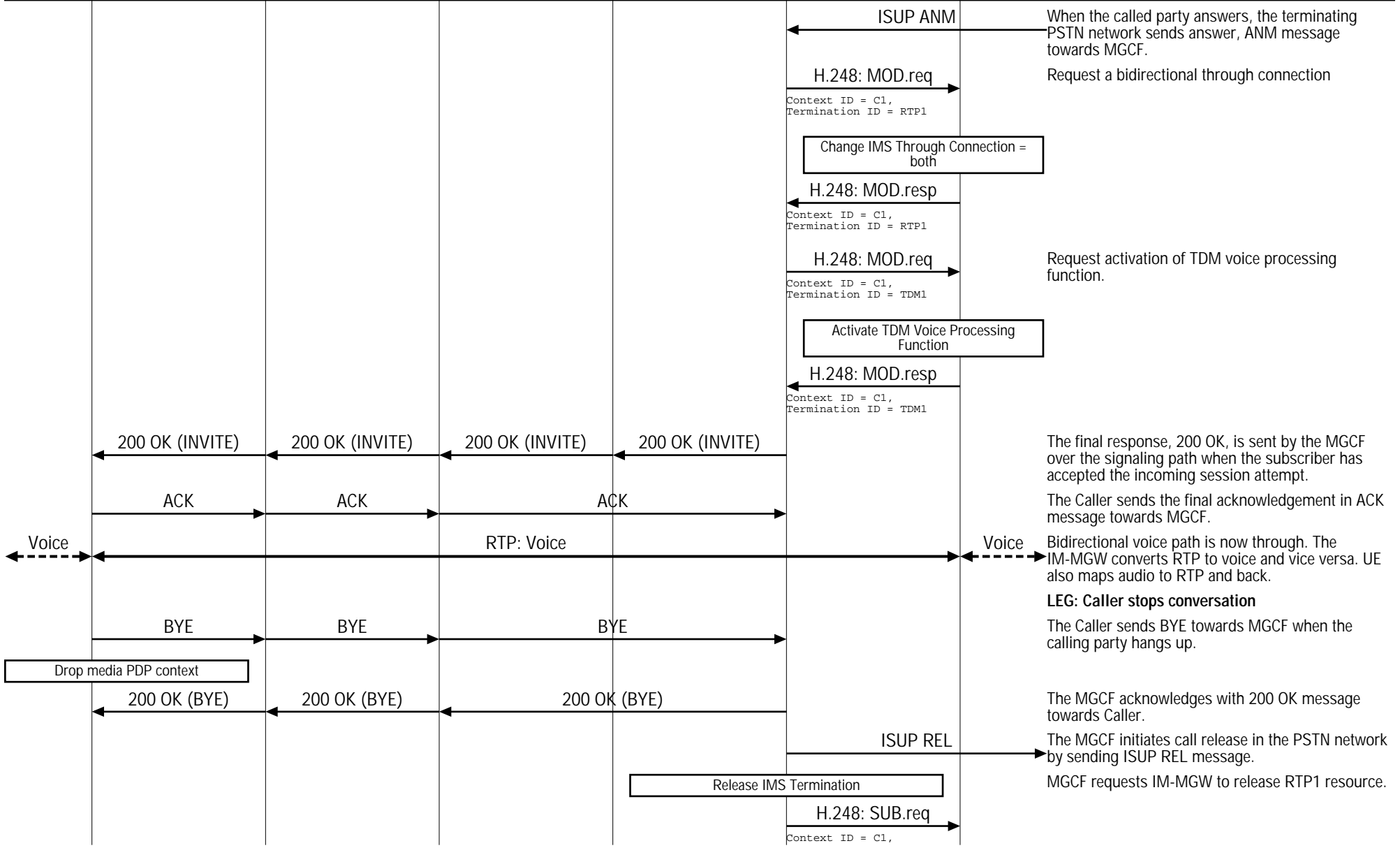


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Caller	Orig P-CSCF	Orig S-CSCF	BGCF	MGCF	IM-MGW	

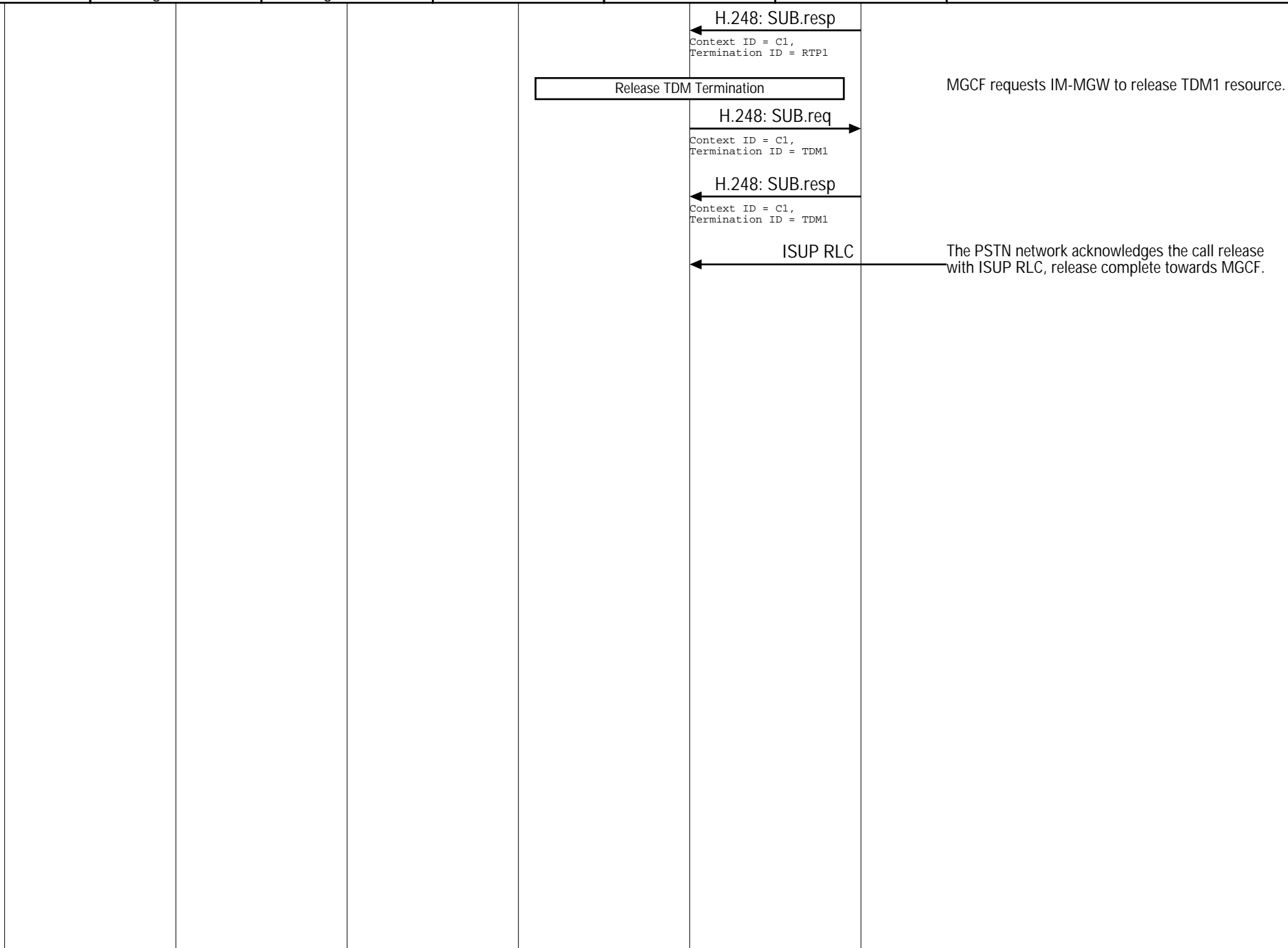


The Caller acknowledges the 180 ringing with PRACK message towards MGCF.  
 The MGCF acknowledges the PRACK message with 200 OK message.

**Conversation Mode**



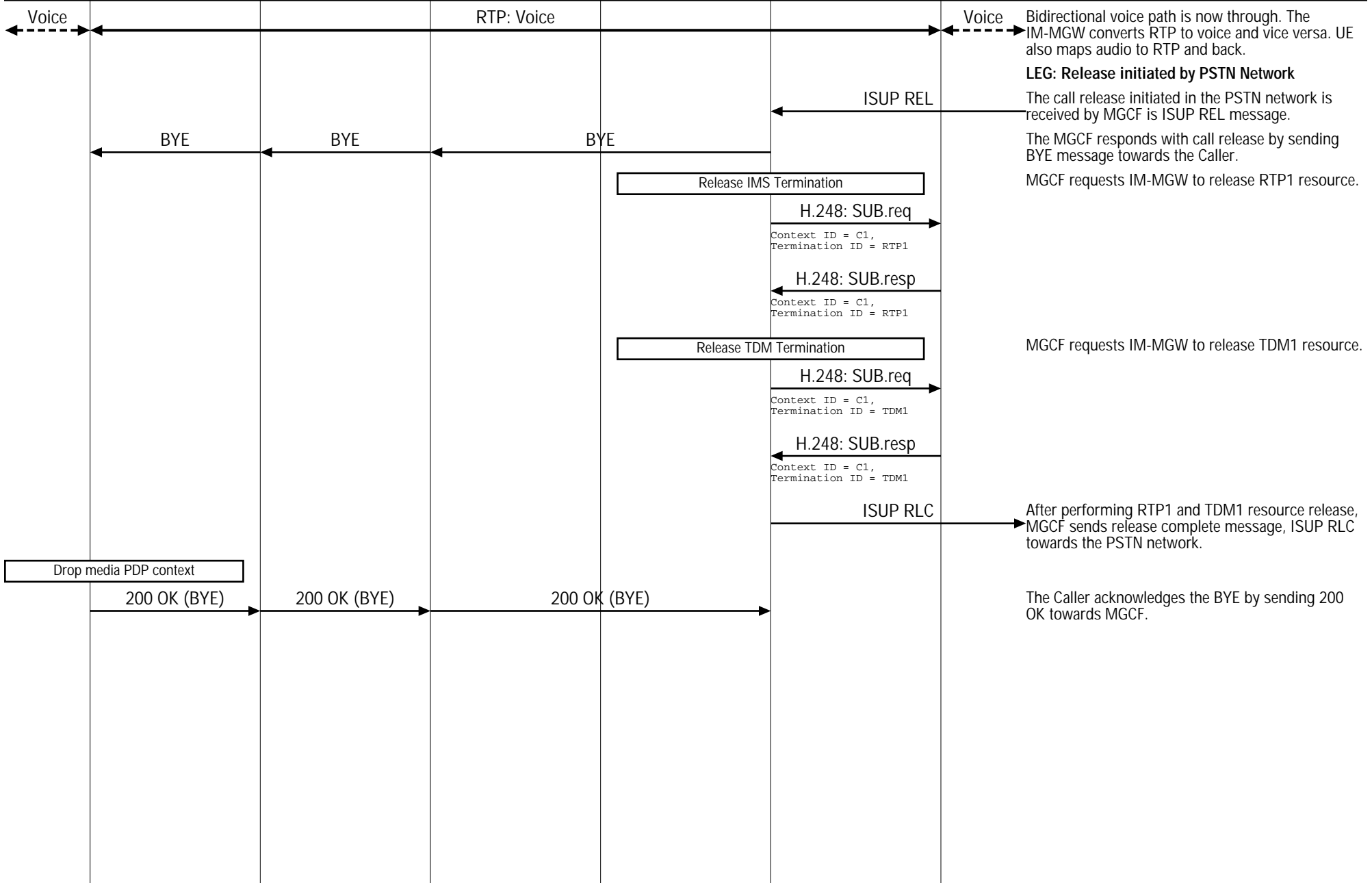
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IMS Originating to PSTN ISUP Call (Called PSTN Subscriber Initiates Release)						
Calling UE	IMS Core Network		PSTN Interface			EventStudio System Designer 4.0
Caller User Equipment	Visited IMS	Home IMS	Signaling		Media	25-Feb-08 08:08 (Page 6)
Caller	Orig P-CSCF	Orig S-CSCF	BGCF	MGCF	IM-MGW	

**LEG: Brief IMS to PSTN(ISUP) Call Setup**

**Call Setup (Same as First Scenario)**



Bidirectional voice path is now through. The IM-MGW converts RTP to voice and vice versa. UE also maps audio to RTP and back.

**LEG: Release initiated by PSTN Network**

The call release initiated in the PSTN network is received by MGCF as ISUP REL message.

The MGCF responds with call release by sending BYE message towards the Caller.

MGCF requests IM-MGW to release RTP1 resource.

MGCF requests IM-MGW to release TDM1 resource.

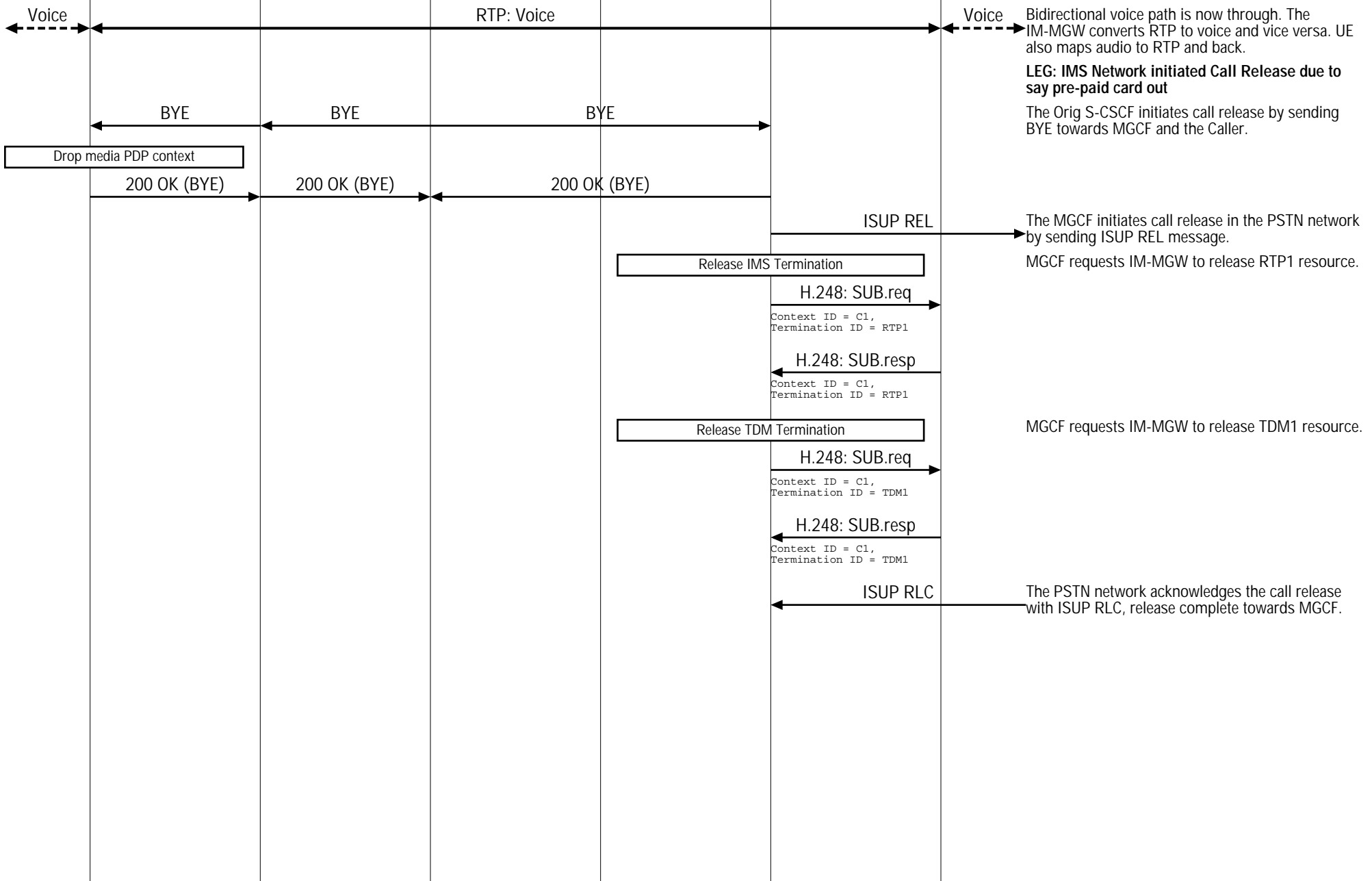
After performing RTP1 and TDM1 resource release, MGCF sends release complete message, ISUP RLC towards the PSTN network.

The Caller acknowledges the BYE by sending 200 OK towards MGCF.

IMS Originating to PSTN ISUP Call (IMS Network Initiates Call Release)						
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Caller User Equipment	Visited IMS	Home IMS	Signaling		Media	25-Feb-08 08:08 (Page 7)
Caller	Orig P-CSCF	Orig S-CSCF	BGCF	MGCF	IM-MGW	

**LEG: Brief IMS to PSTN(ISUP) Call Setup**

**Call Setup (Same as First Scenario)**



Bidirectional voice path is now through. The IM-MGW converts RTP to voice and vice versa. UE also maps audio to RTP and back.

**LEG: IMS Network initiated Call Release due to say pre-paid card out**

The Orig S-CSCF initiates call release by sending BYE towards MGCF and the Caller.

The MGCF initiates call release in the PSTN network by sending ISUP REL message.

MGCF requests IM-MGW to release RTP1 resource.

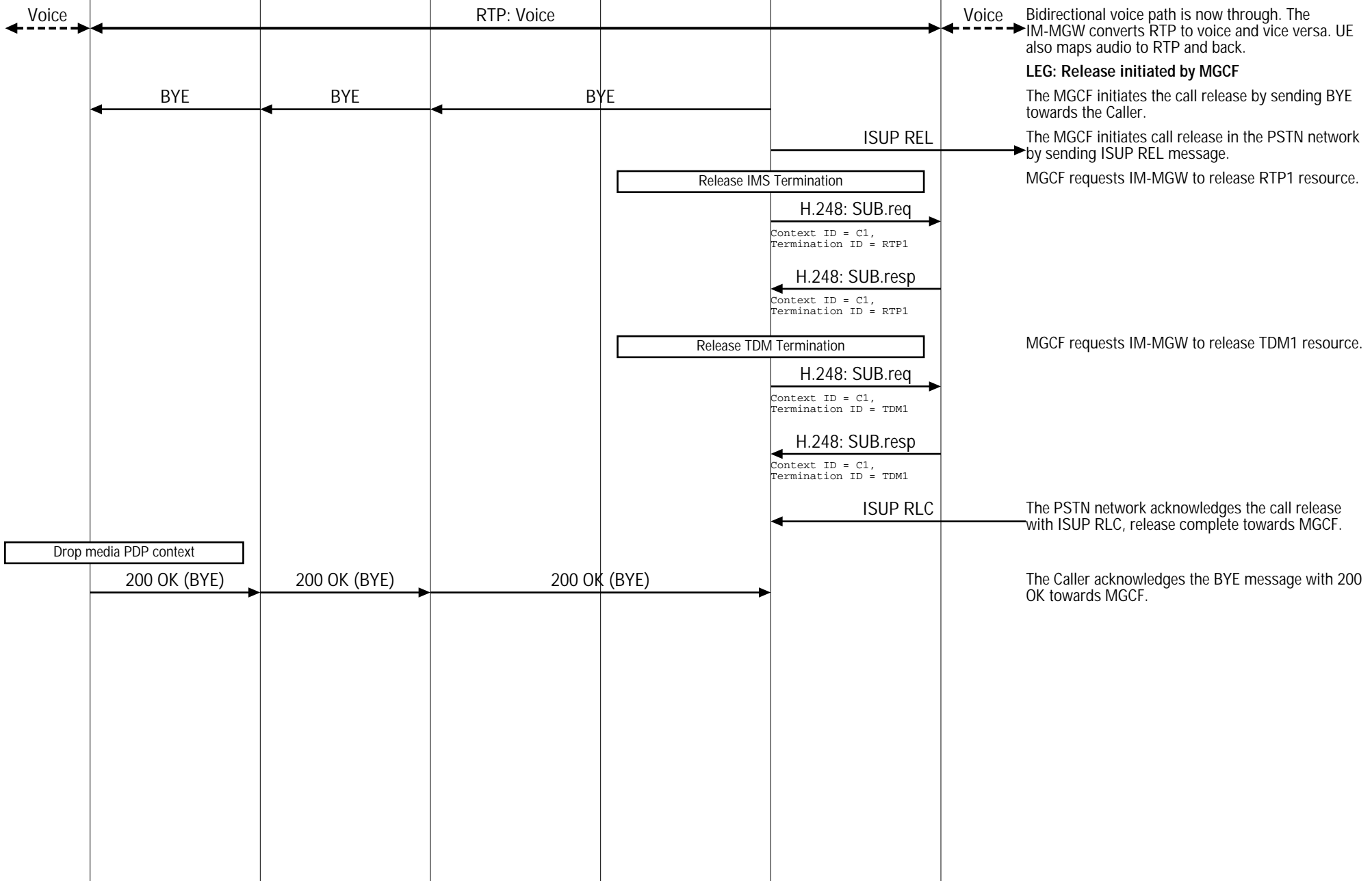
MGCF requests IM-MGW to release TDM1 resource.

The PSTN network acknowledges the call release with ISUP RLC, release complete towards MGCF.

IMS Originating to PSTN ISUP Call (MGCF Initiated Call Release)						
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Caller	Orig P-CSCF	Orig S-CSCF	BGCF	MGCF	IM-MGW	

**LEG: Brief IMS to PSTN(ISUP) Call Setup**

**Call Setup (Same as First Scenario)**



Bidirectional voice path is now through. The IM-MGW converts RTP to voice and vice versa. UE also maps audio to RTP and back.

**LEG: Release initiated by MGCF**

The MGCF initiates the call release by sending BYE towards the Caller.

The MGCF initiates call release in the PSTN network by sending ISUP REL message.

MGCF requests IM-MGW to release RTP1 resource.

MGCF requests IM-MGW to release TDM1 resource.

The PSTN network acknowledges the call release with ISUP RLC, release complete towards MGCF.

The Caller acknowledges the BYE message with 200 OK towards MGCF.