

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 6
Caller User Equipment	Visited IMS	Home IMS	Signaling		Media
Caller	Orig P-CSCF	Orig S-CSCF	BGCF	MGCF	IM-MGW
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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.

This sequence diagram was generated with EventStudio System Designer (<http://www.EventHelix.com/EventStudio>).

IMS to PSTN(ISUP) call setup

Initiate Call

Called PSTN Telephone Number

IMS to PSTN Call Routing via BGCF

Prepare a list of supported codecs

INVITE

```
tel:<called phone number>,
caller@hims1.net,
caller supported coded list,
UE RTP Port,
UE IP Address
```

Make sure INVITE was received over IPSec Security Association

INVITE

```
tel:<called phone number>,
caller@hims1.net,
caller supported coded list,
Record-Route:<Orig P-CSCF>
```

100 Trying

Use DNS to translate tel:<called phone number> to terminating SIP URI.

Route session request to Breakout Gateway Control Function in the same network

INVITE

```
tel:<called phone number>,
S-CSCF address,
<caller@hims1.net,
<caller supported coded list,
Record-Route:<Orig S-CSCF> <Orig P-CSCF>
```

100 Trying

An IMS user initiates a call to a PSTN phone number.

The Calling SIP phone sends INVITE to P-CSCF. The message includes the codecs available, the UE RTP port number and IP address.

The INVITE was sent using registration time SA so P-CSCF accepts the request.

The Orig P-CSCF forwards INVITE to Orig S-CSCF. The IP Address of Orig S-CSCF was obtained at the time of Registration in 200 OK response to REGISTER message.

Orig P-CSCF acknowledges INVITE to Caller UE.

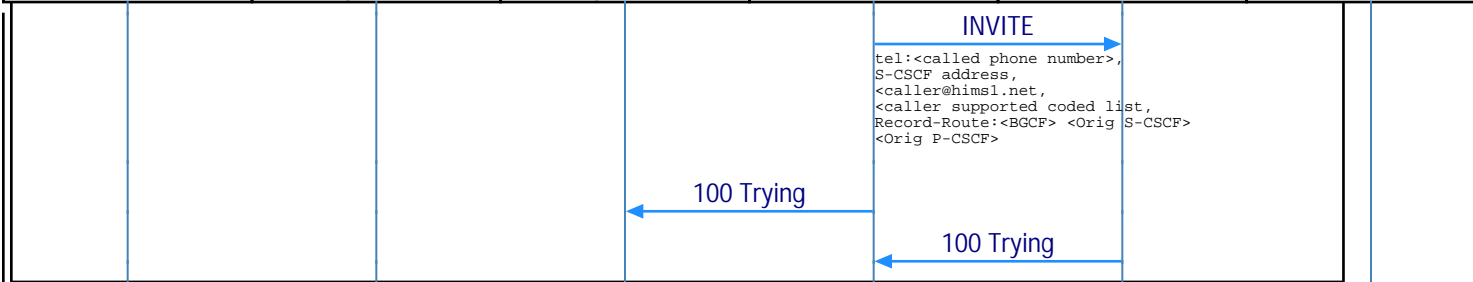
The conversion from PSTN telephone number to SIP URI required for routing fails which indicates that we have to reach called party in CS network.

The S-CSCF concludes that the destination address is in a PSTN network. So, the Orig S-CSCF forwards the request to a local BGCF.

The S-CSCF forwards the INVITE to the local BGCF (Breakout Gateway Control Function) for further routing of the call.

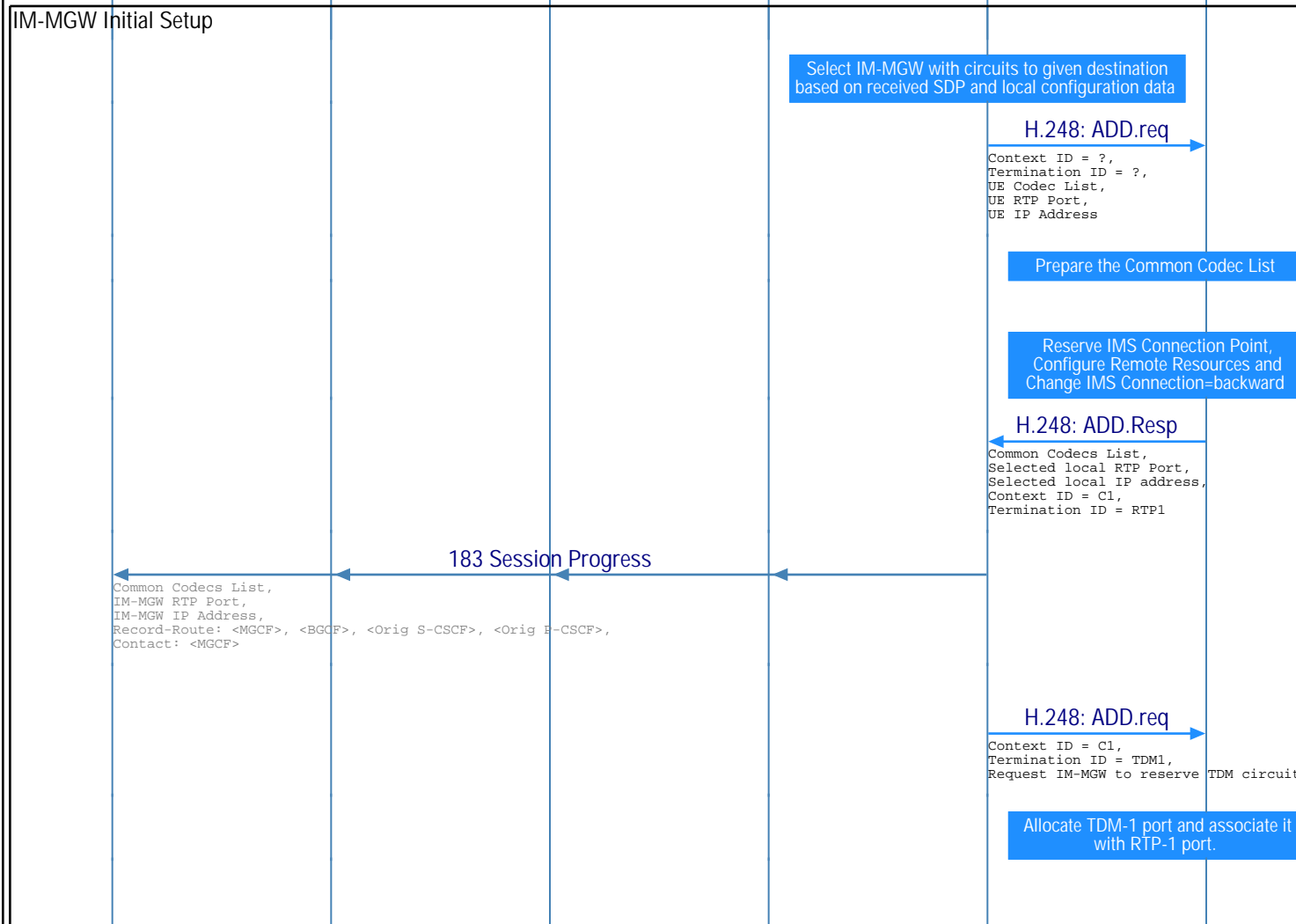
Based on further analysis of the destination address, and PSTN network configuration, the BGCF either selects a local MGCF to perform the termination or it forwards the request to a BGCF in another network who selects the MGCF to perform the termination.

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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.

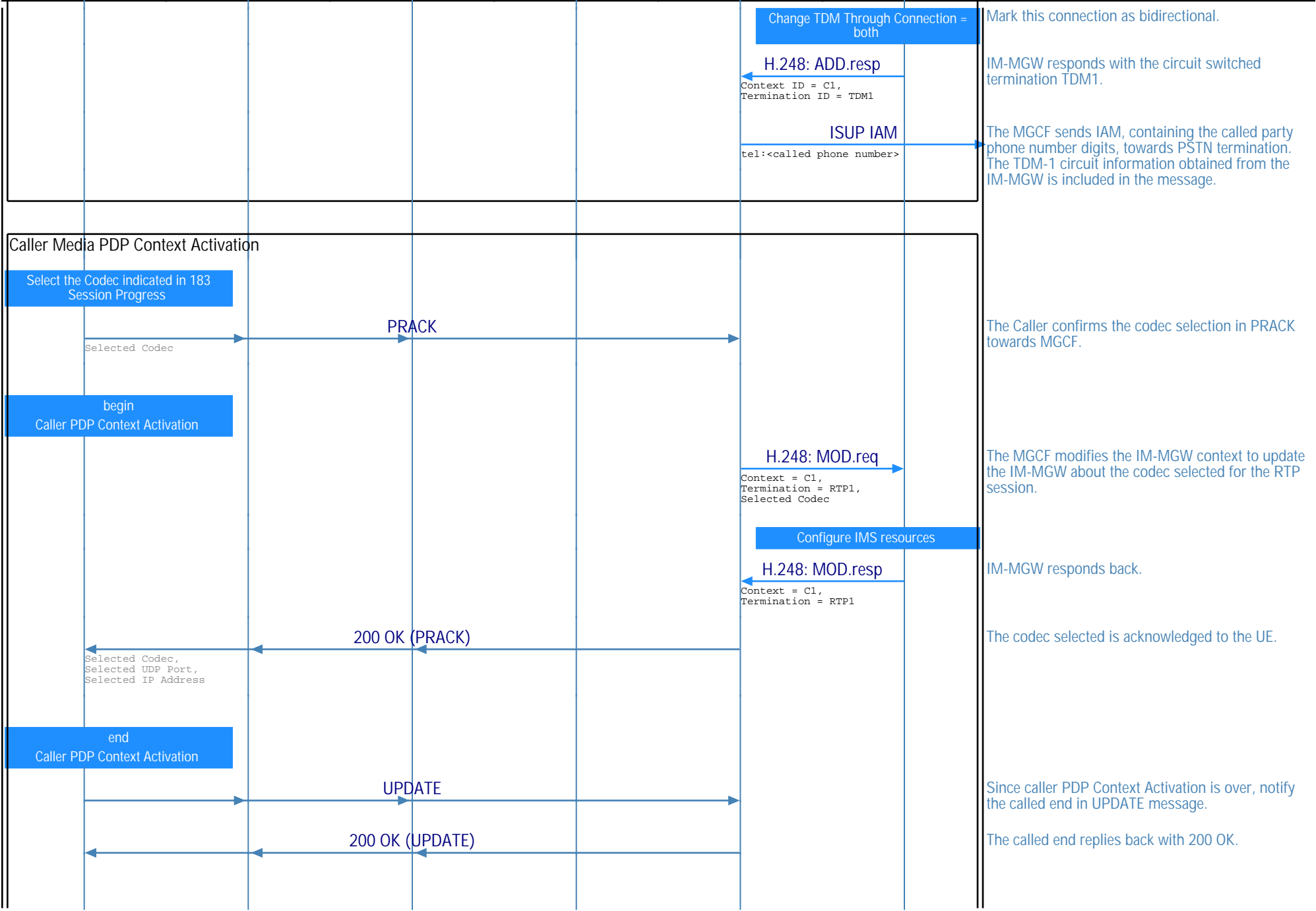
The IM-MGW responds with the allocated context, the common codecs, the local IP address and the RTP port.

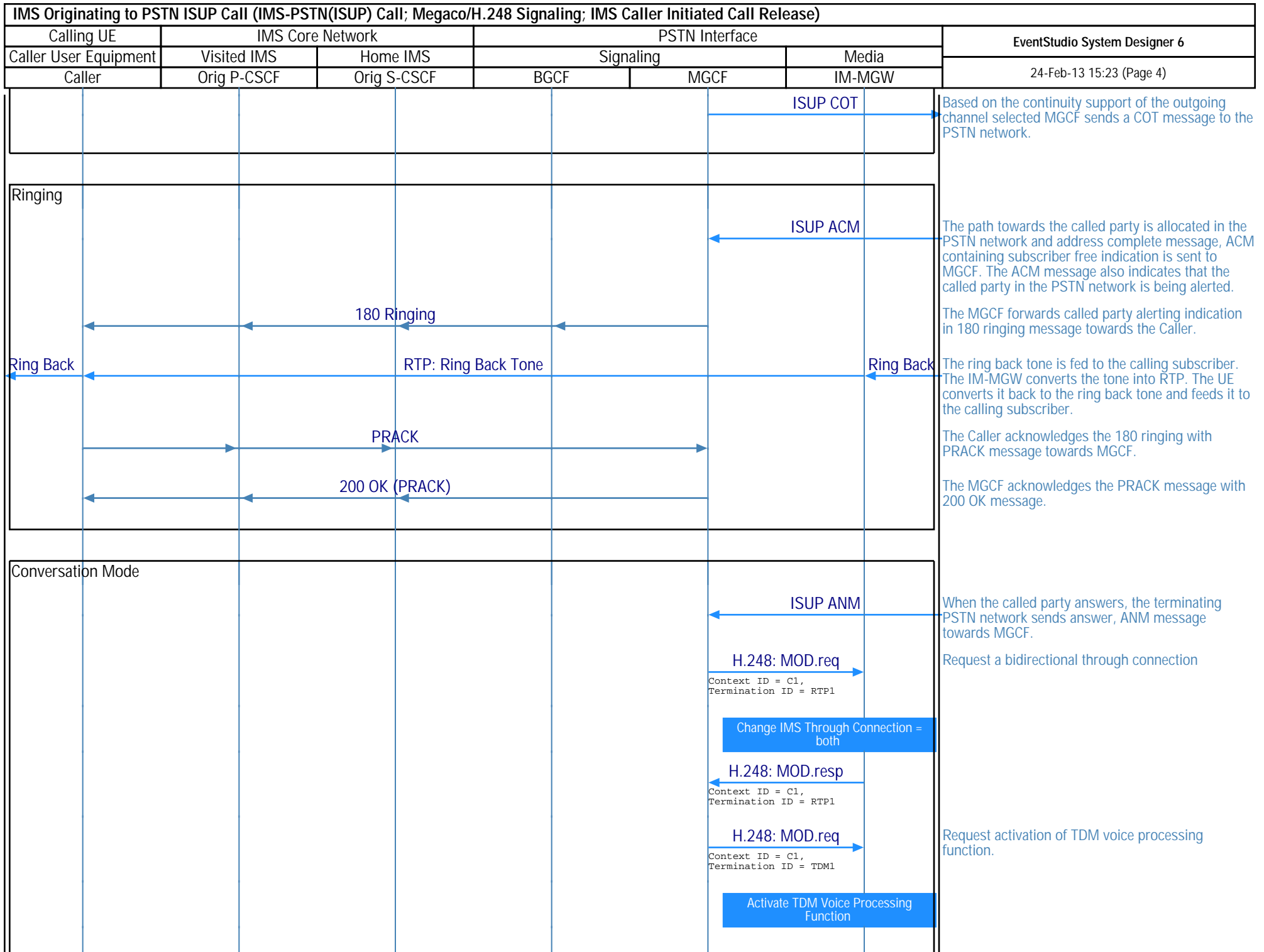
The MGCF returns the media stream capabilities of the destination along the signaling path in a "183 Session Progress". The IM-MGW "Common Codec List", IP address and the RTP port number are included in the message.

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.

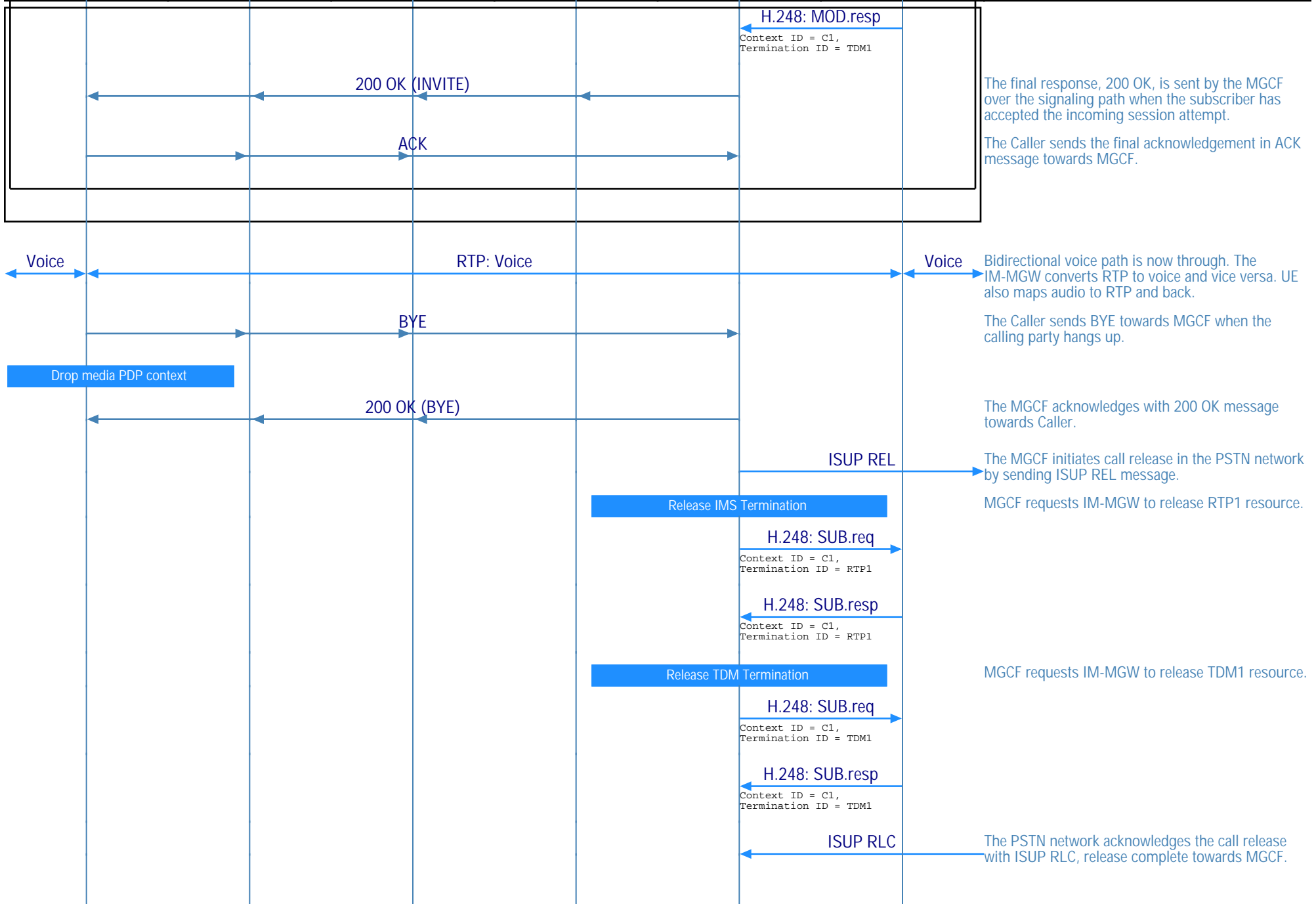
Since the TDM circuit setup request was received for the same context id as the RTP-1 context, the IM-MGW associates the RTP-1 and TDM-1 ports.

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Caller User Equipment	Visited IMS	Home IMS	Signaling		Media	24-Feb-13 15:23 (Page 3)
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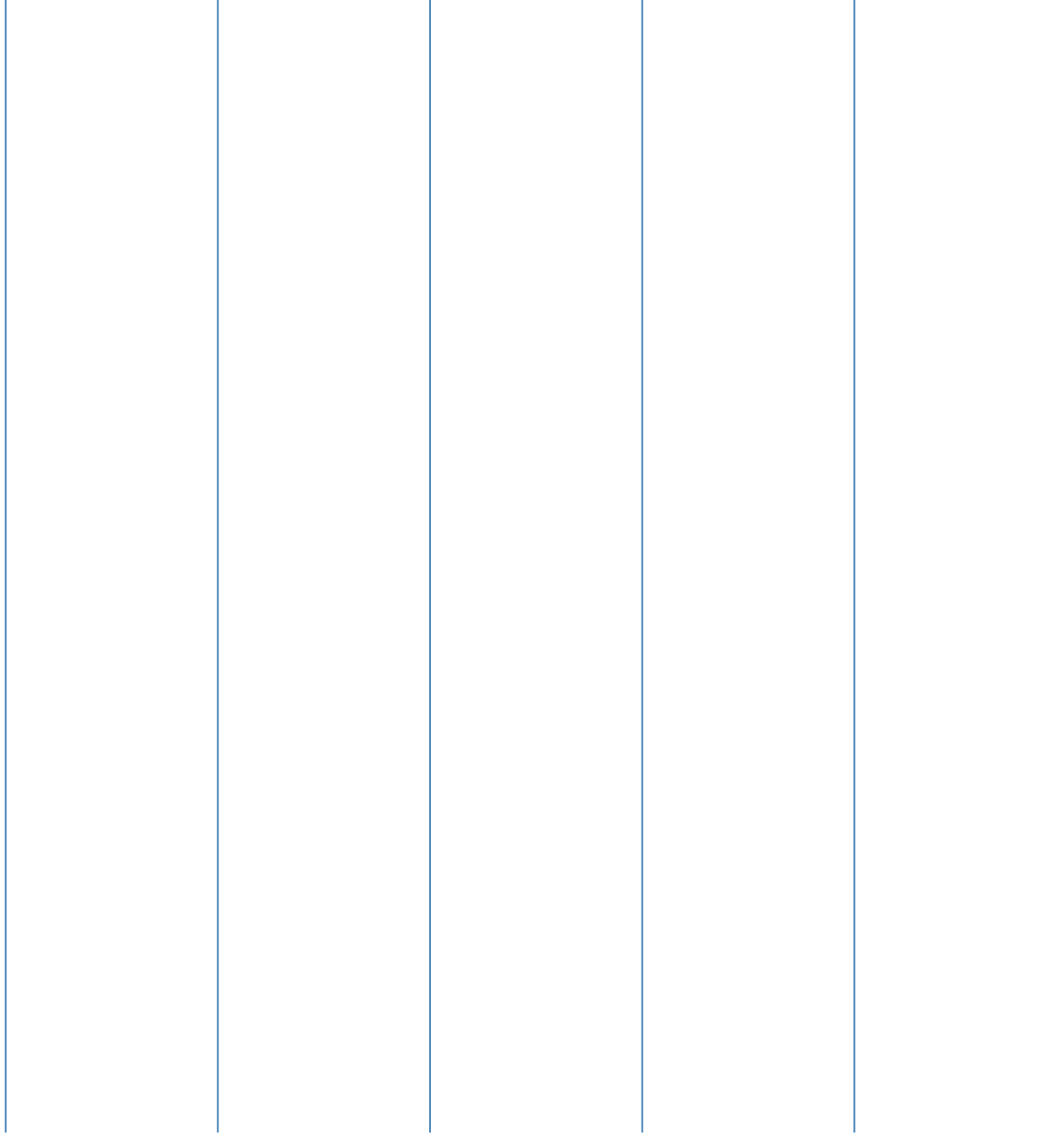


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Calling UE	IMS Core Network		PSTN Interface		EventStudio System Designer 6
Caller User Equipment	Visited IMS	Home IMS	Signaling		Media
Caller	Orig P-CSCF	Orig S-CSCF	BGCF	MGCF	IM-MGW
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IMS Originating 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 6
Caller User Equipment	Visited IMS	Home IMS	Signaling		Media	24-Feb-13 15:23 (Page 6)
Caller	Orig P-CSCF	Orig S-CSCF	BGCF	MGCF	IM-MGW	

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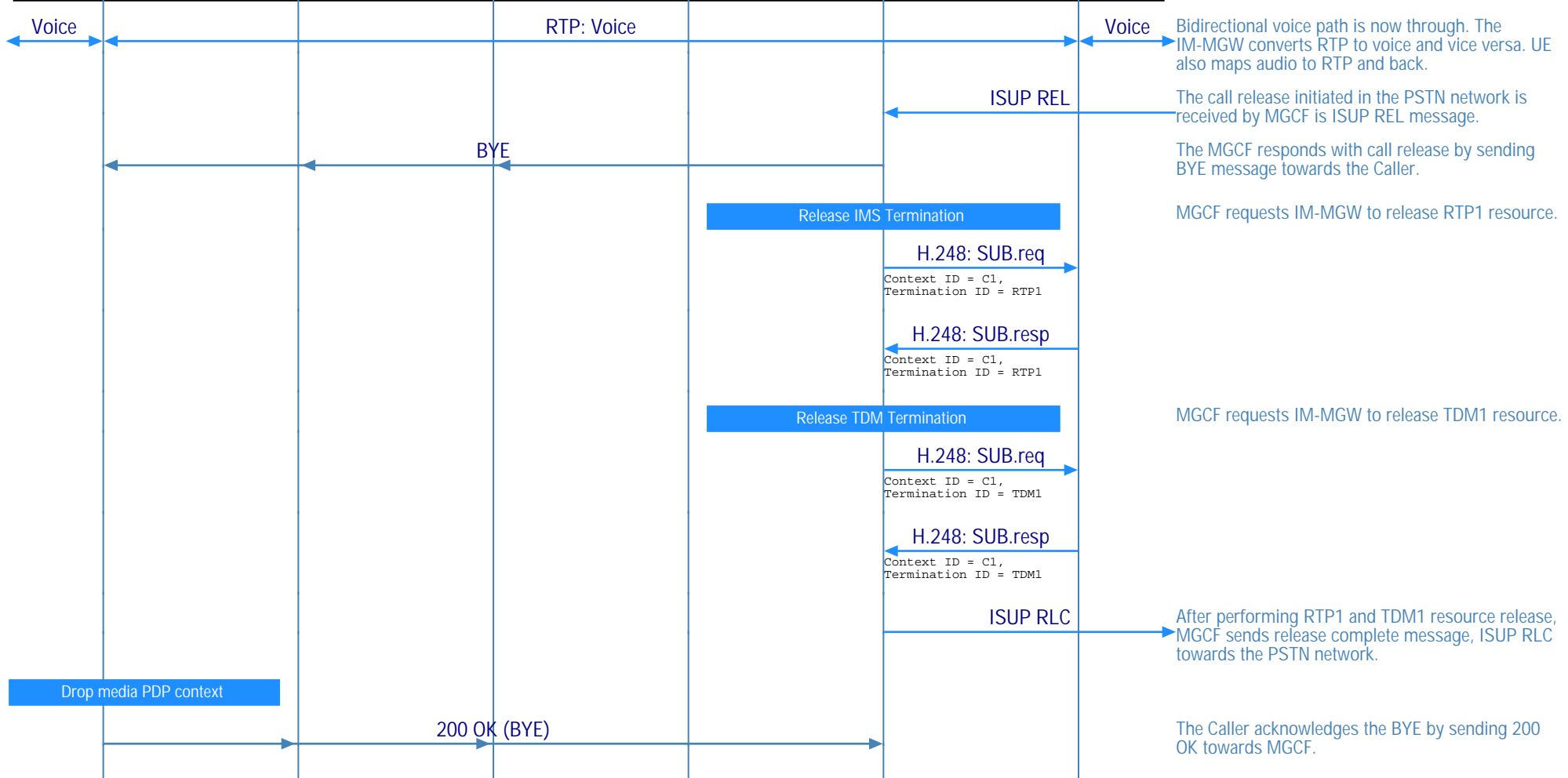


IMS Originating to PSTN ISUP Call (Called PSTN Subscriber Initiates Release)					
Calling UE	IMS Core Network		PSTN Interface		EventStudio System Designer 6
Caller User Equipment	Visited IMS	Home IMS	Signaling		Media
Caller	Orig P-CSCF	Orig S-CSCF	BGCF	MGCF	IM-MGW
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This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

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IMS to PSTN(ISUP) call setup



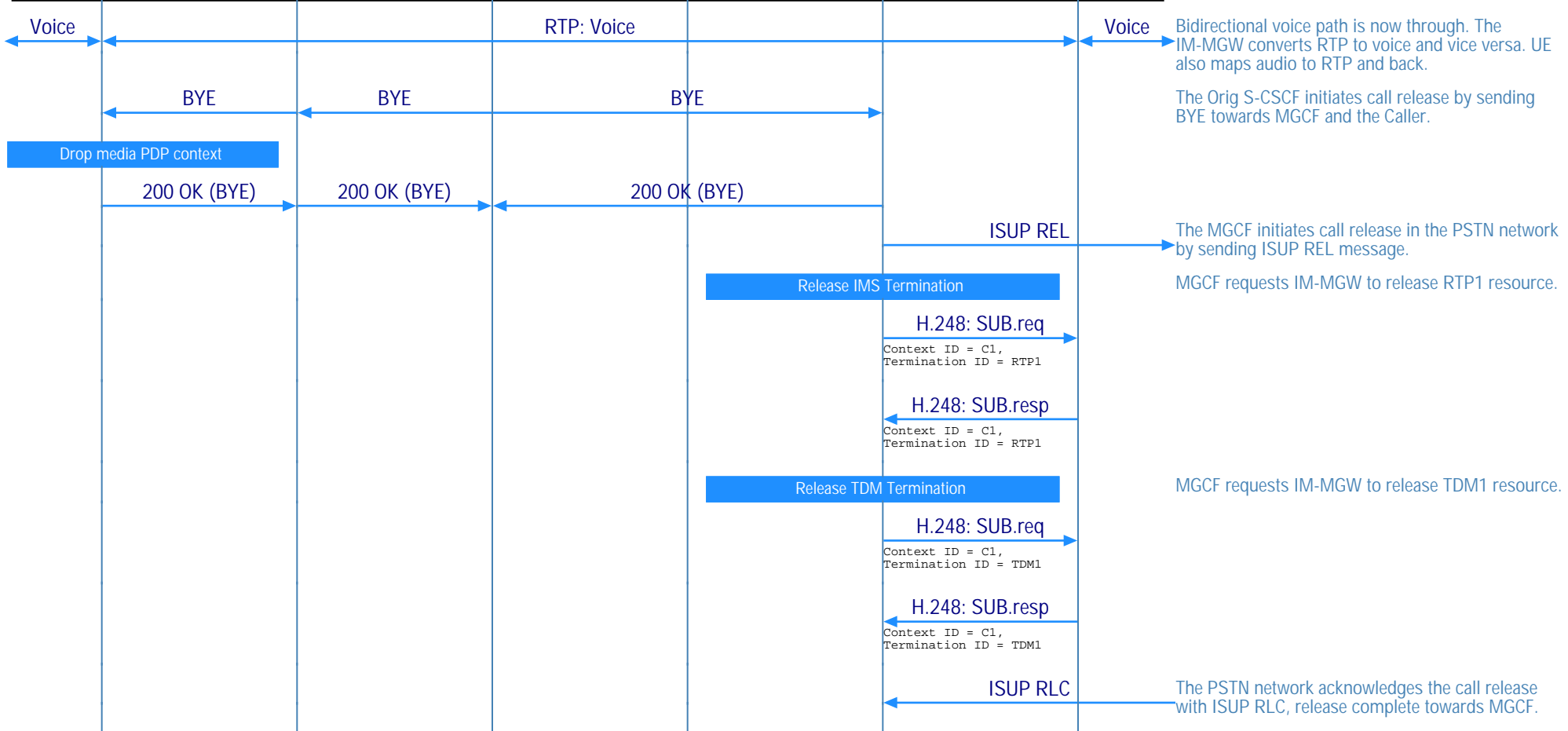
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IMS Originating to PSTN ISUP Call (IMS Network Initiates Call Release)						
Calling UE	IMS Core Network		PSTN Interface			EventStudio System Designer 6
Caller User Equipment	Visited IMS	Home IMS	Signaling		Media	24-Feb-13 15:23 (Page 8)
Caller	Orig P-CSCF	Orig S-CSCF	BGCF	MGCF	IM-MGW	

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.

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IMS to PSTN(ISUP) call setup

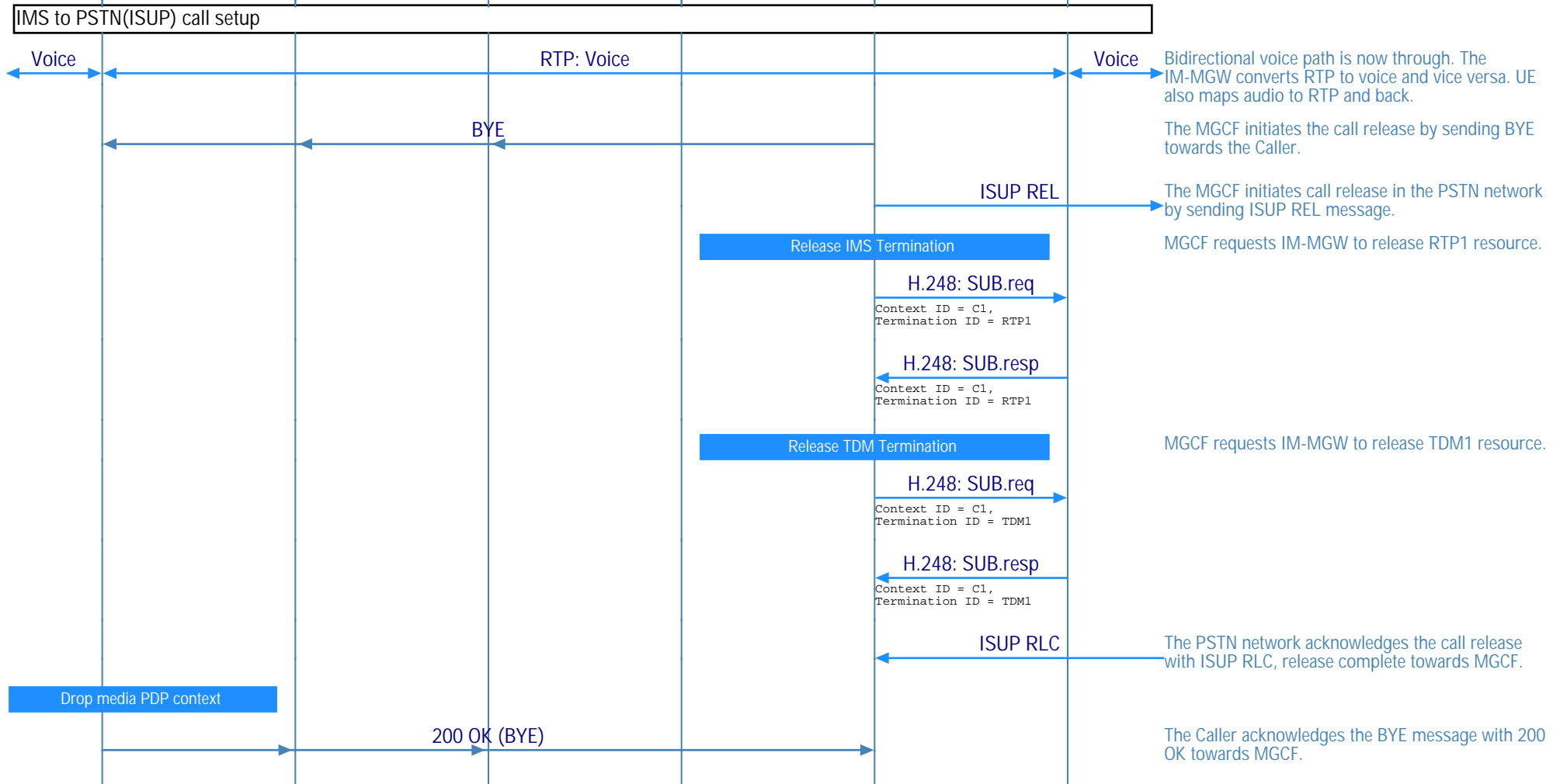


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IMS Originating to PSTN ISUP Call (MGCF Initiated Call Release)						
Calling UE	IMS Core Network		PSTN Interface			EventStudio System Designer 6
Caller User Equipment	Visited IMS	Home IMS	Signaling		Media	24-Feb-13 15:23 (Page 9)
Caller	Orig P-CSCF	Orig S-CSCF	BGCF	MGCF	IM-MGW	

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.

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