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SERIES Q: SWITCHING AND SIGNALLING

**Supplement to Recommendations ITU-T Q.3610
and ITU-T Q.3611 – Service flows for customized
multimedia ring-back tone (CRBT) and
customized multimedia ringing tone (CRT)
services**

ITU-T Q-series Recommendations – Supplement 60

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Supplement 60 to ITU-T Q-series Recommendations

Supplement to Recommendations ITU-T Q.3610 and ITU-T Q.3611 – Service flows for customized multimedia ring-back tone (CRBT) and customized multimedia ringing tone (CRT) services

Summary

Supplement 60 to ITU-T Q-series Recommendations provides the service flows for customized multimedia ring-back tone (CRBT) and customized multimedia ringing tone (CRT) services in next generation networks (NGNs).

History

Edition	Recommendation	Approval	Study Group
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Supplement 60 to ITU-T Q-series Recommendations

Supplement to Recommendations ITU-T Q.3610 and ITU-T Q.3611 – Service flows for customized multimedia ring-back tone (CRBT) and customized multimedia ringing tone (CRT) services

1 Scope

This supplement provides the service flows for customized multimedia ring-back tone (CRBT) and customized multimedia ringing tone (CRT) services in next generation networks (NGNs). These service flows include different service models: gateway model, application server model and HTTP model which are defined in [ITU-T Q.3610] and [ITU-T Q.3611], and additional service flows for interoperation and service priority.

2 References

- [ITU-T Q.3610] Recommendation ITU-T Q.3610 (2009), *Signalling requirements and protocol profiles for customized ring-back tone service*.
- [ITU-T Q.3611] Recommendation ITU-T Q.3611 (2009), *Signalling requirements and protocol profiles for NGN customized ringing tone service*.

3 Definitions and acronyms

This supplement uses the definitions from [ITU-T Q.3610] and [ITU-T Q.3611].

4 Abbreviations

This supplement uses the following abbreviations:

AS	Application Server
AS-FE	Application Support Functional Entity
CRBT	Customized Ring-Back Tone
CRBT-O	Customized Ring-Back Tone by Originating network
CRBT-T	Customized Ring-Back Tone by Terminating network
CRT	Customized Ringing Tone
CRT-O	Customized Ringing Tone by Originating network
CRT-T	Customized Ringing Tone by Terminating network
HTTP	Hypertext Transfer Protocol
IBC-FE	Interconnection Border Gateway Control Functional Entity
I-CSC-FE	Interrogating Call Session Control Functional Entity
IMS	IP Multimedia Subsystem
MGC-FE	Media Gateway Control Functional Entity
MRC-FE	Media Resource Control Functional Entity
MRP-FE	Media Resource Processing Functional Entity
P-CSC-FE	Proxy Call Session Control Functional Entity
S-CSC-FE	Serving Call Session Control Functional Entity



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SDP	Session Description Protocol
SG-FE	Signalling Gateway Functional Entity
UE	User Equipment
UE-A	User Equipment for user A
UE-B	User Equipment for user B

5 Service flows for CRBT service

5.1 Gateway model

5.1.1 IMS-based CRBT service by Gateway model with PRACK and UPDATE

An IMS-based Gateway model with UPDATE method for CRBT service without preconditions is illustrated in Figure 5-1.

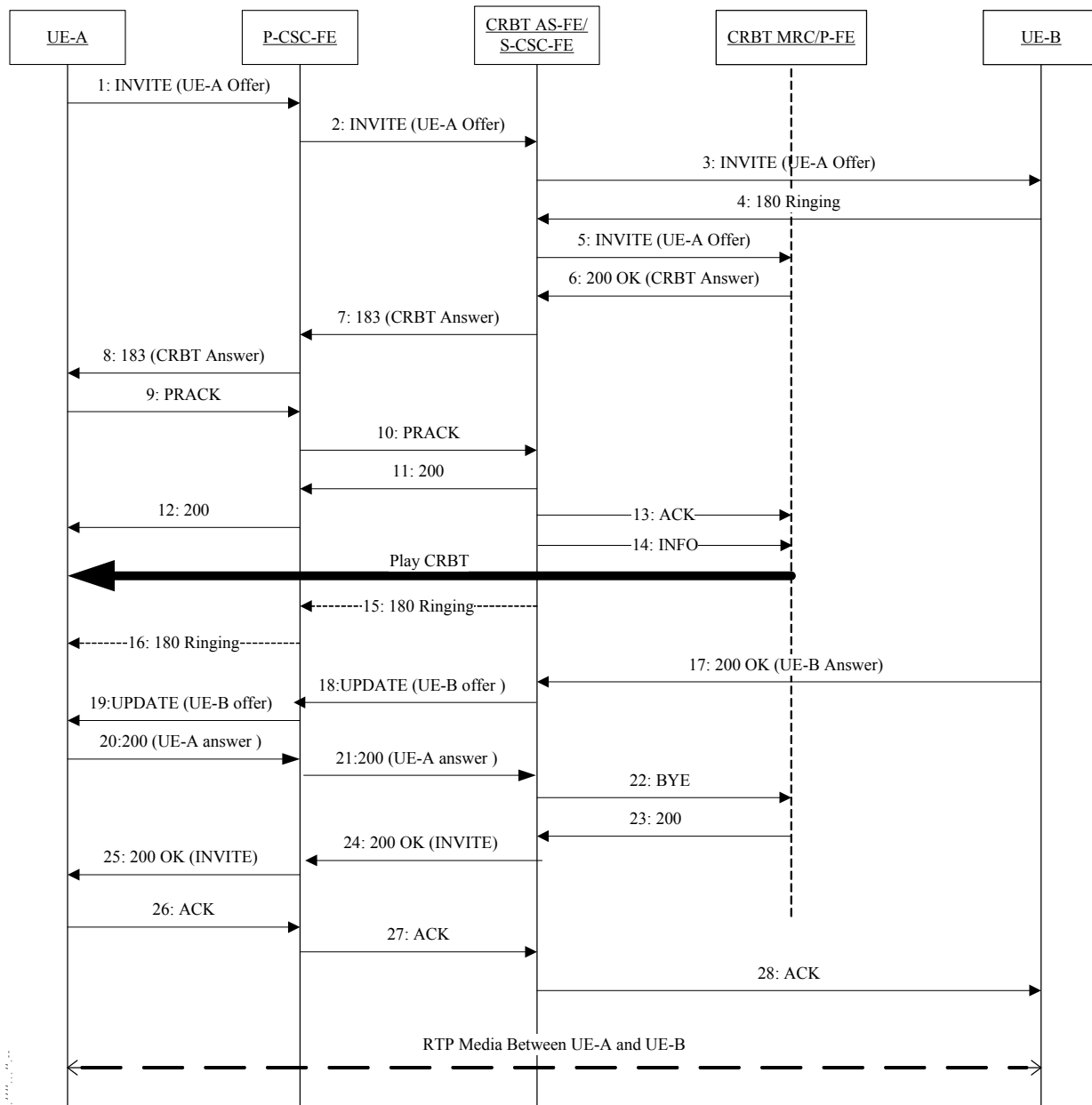


Figure 5-1 – IMS-based CRBT service flow by Gateway model with PRACK and UPDATE

The details of the service flow in Figure 5-1 are described as follows:

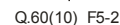
- (1)(2) UE-A sends "INVITE (UE-A Offer)" to UE-B through P-CSC-FE. The "INVITE" is routed through the CRBT AS-FE due to initial filter triggers on the S-CSC-FE.
- (3) The CRBT AS-FE forwards the initial "INVITE" request to UE-B.
- (4) UE-B rings and generates a "180 (Ringing)" response to UE-A. The "180 (Ringing)" first arrives at CRBT AS-FE.
- (5) Terminating CRBT AS-FE determines UE-B or originating CRBT AS-FE determines that UE-A has subscribed to CRBT service, CRBT AS-FE sends the initial INVITE request to CRBT MRC/P-FE. This step can take place directly after step (2).
- (6) CRBT MRC/P-FE sends "200 OK (CRBT Answer)" to CRBT AS-FE.

- (7-8) CRBT AS-FE sends a reliable "183 (CRBT Answer)" response to UE-A through P-CSC-FE.
- (9-10) UE-A acknowledges the reliable provisional response with "PRACK". The message first arrives at CRBT AS-FE.
- (11-12) CRBT AS-FE sends "200 OK" response to the "PRACK" to UE-A.
- (13) CRBT AS-FE sends "ACK" request to CRBT MRC-FE. This step can take place directly after step (10).
- (14) CRBT AS-FE sends INFO request to CRBT MRC/P-FE to indicate to it to start playing CRBT to UE-A.
- (15-16) CRBT AS-FE may forward the "180 Ringing" response from UE-B to UE-A through P-CSC-FE.
- (17) UE-B answers the call, and sends "200 OK (UE-B Answer)" towards UE-A. The message first arrives at CRBT AS-FE.
- (18) CRBT AS-FE sends "UPDATE (UE-B Offer)" request towards UE-A. The message first arrives at P-CSC-FE.
- (19) P-CSC-FE forwards the "UPDATE (UE-B Offer)" request towards UE-A.
- (20) UE-A sends "200 OK (UE-A Answer)" response towards CRBT AS-FE. The message first arrives at P-CSC-FE.

NOTE – In each valid Media type (video, audio, etc.), UE-A must keep the same RTP port as it is indicated for the first time.

- (21) P-CSC-FE forwards the "200 OK (UE-A Answer)" response towards CRBT AS-FE.
- (22) CRBT AS-FE decides to stop playing CRBT, then sends "BYE" request to CRBT MRC/P-FE.
- (23) CRBT MRC/P-FE stops playing CRBT and sends "200 OK" response to CRBT AS-FE.
- (24) Confirming that the UE-A has finished the offer/Answer negotiation with UE-B, CRBT-AS sends "200 OK (INVITE)" response to the initial INVITE request towards UE-A. The message first arrives at P-CSC-FE.
- (25) P-CSC-FE forwards the "200 OK (INVITE)" response towards UE-A.
- (26) UE-A sends an "ACK" request towards UE-B. This message first arrives at P-CSC-FE, and then arrives at CRBT AS-FE.
- (27) P-CSC-FE forwards the "ACK" request towards CRBT AS-FE.
- (28) CRBT AS-FE forwards the "ACK" request towards UE-B.

An IMS-based Gateway model with re-INVITE method for CRBT service without preconditions is illustrated in Figure 5-2.



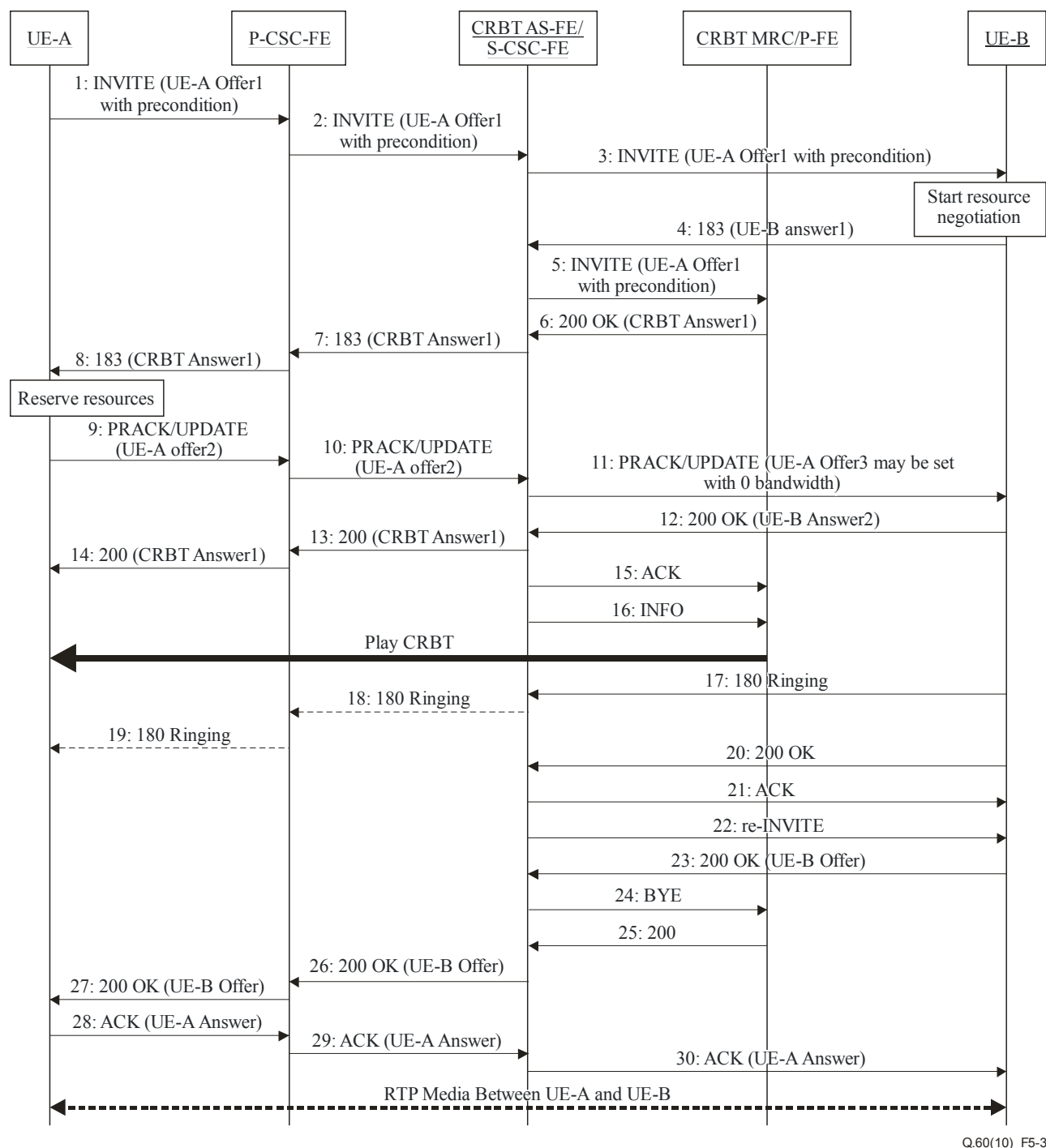
- (1)(2) UE-A sends "INVITE (UE-A Offer)" to UE-B through P-CSC-FE. The "INVITE" is routed through the CRBT AS-FE due to initial filter triggers on the S-CSC-FE.
- (3) The CRBT AS-FE forwards the initial "INVITE" request to UE-B. In order not to make an RTCP error at UE-B, AS-FE may set all media types bandwidth to 0.
- (4) UE-B rings and generates a "180 (Ringing)" response to UE-A. The "180 (Ringing)" first arrives at CRBT AS-FE. UE-B starts resource negotiation, and if bandwidth of the offered media is 0, UE-B shall disable RTCP to avoid error. This step may take place after step 13.
- (5-17) Procedures are the same as service flows in Figure 5-1.

- (18) CRBT AS-FE sends "ACK" request towards UE-B.
- (19) CRBT AS-FE sends "re-INVITE" request without SDP towards UE-B.
- (20) UE-B sends "200 OK (UE-B Offer)" response towards UE-A. This message first arrives at CRBT AS-FE.
- (21) CRBT AS-FE decides to stop playing CRBT, then sends "BYE" request to CRBT MRC/P-FE. This step can take place directly after step 16.
- (22) CRBT MRC/P-FE stops playing CRBT and sends "200 OK" response to CRBT AS-FE.
- (23) CRBT AS-FE sends "200 OK (UE-B Offer)" response to the initial INVITE request towards UE-A. The message first arrives at P-CSC-FE. P-CSC-FE may start the charging function.
- (24) P-CSC-FE forwards the "200 OK (UE-B Offer)" response towards UE-A.
- (25-26) UE-A sends an "ACK (UE-A Answer)" request towards UE-B. This message arrives at CRBT AS-FE.
- (27) CRBT AS-FE forwards the "ACK (UE-A Answer)" request towards UE-B.

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5.1.3 IMS-based Gateway model with preconditions

A Gateway model for CRBT service with preconditions is illustrated in Figure 5-3.



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Figure 5-3 – CRBT service flow in IMS with preconditions

The details of the service flow in Figure 5-3 are described as follows:

- (1)(2) UE-A sends "INVITE (UE-A Offer1)" to UE-B through P-CSC-FE. The "INVITE" is routed through the CRBT AS-FE due to initial filter triggers on the S-CSC-FE. The UE-A needs resource reservation (e.g., mobile phone), so UE-A Offer1 SDP carries this with precondition.
- (3) The CRBT AS-FE forwards the initial "INVITE" request to UE-B. UE-B starts resource negotiation and resource reservation.