

MTAS 16B Technical Product Description Conference AS

TECHN PRODUCT DESCR



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1 Introduction

1.1 Scope

This document is part of MTAS TPD document series and focuses on Conference AS. For MTAS common features and other application server features, please read other TPD documents.

1.2 Change History

Table 1 - Revision History

| Revision | Date | Comments/Changes |
|----------|------------|----------------------------------|
| A | 2015-11-16 | First version for MTAS 16A |
| B | 2016-04-28 | Title, header and footer updated |

2 Conference AS Features

2.1 Overview

The Ericsson Conference AS conference service is 3GPP R8 / TISPAN R2 compliant

List of features:

- Scheduled Conferencing

2.2 Scheduled Conferencing

2.2.1 Description

The Scheduled Conference service provides a Conference Owner (CO) with the possibility to create conference focus resources in advance, distribute an invitation including the conference identity (PIN code) and let Conference Participants (CP) dial in to the conference at a scheduled time.

The Conference AS provides the traffic function of scheduled conferencing. The conference focus resource is created on behalf of the CO by an external Conference Administration Server (CAS) over the CCMP interface. The user interface towards the CO to schedule, distribute and manage conference resources as well as calendar, corporate directory, SMS/E-mail server integration is provided by the CAS and has no impact on the Conference AS.

The CO must be defined as an IMS subscriber in order to create scheduled conference resources.



The main use-cases of the scheduled conference function are:

- Conference owner creates a conference
- Conference owner reads conference status
- Conference owner deletes a conference
- Conference owner updates a conference (lock/unlock)
This use-case requires the availability of a valid In Conference Control license.
- Conference participant joins conference
- Conference participant leaves a conference
- In conference modification by participant
- Conference owner updates the media status of one or more media streams of participant over the CCMP interface.
This use-case requires the availability of a valid In Conference Control license.
- Conference owner removes a participant from the conference over the CCMP interface
This use-case requires the availability of a valid In Conference Control license.
- Conference owner invites a new participant to the conference over the CCMP interface
This use-case requires the availability of a valid In Conference Control license.

Conference participants (CP) connect to a scheduled conference using a Service Number (SN). The SN is a global E.164 telephone number representing the scheduled conference service for a specific customer, typically a company. There are two alternative ways to dial in to a scheduled conference in the Conference AS.

- 1 Using a TEL URI with the phone number of the service number. The Conference AS will initiate IVR procedure upon receiving the request and play a preconfigured announcement requesting the CP to provide the PIN code of the conference.
- 2 Using a SIP Request-URI with embedded PIN code information. Since the PIN code is provided as part of the RURI, the CP is immediately connected to the conference focus without an IVR procedure. This alternative is used when an embedded hyperlink is provided in the SMS/E-mail invitation to simplify conference dial in.

PIN codes including CO references are stored by the Conference AS in HSS per service number. Each conference is identified by two PIN codes, moderator PIN and participant PIN. The moderator PIN is used to identify the moderator of the conference in case a 'Wait for moderator' policy applies.



If Attendant Assistance is activated, the CP is routed to Attendant when the maximum number of PIN code attempts is exceeded when providing the PIN code of the conference.

The Conference AS supports content sharing scheduled conferences using a dedicated content sharing video stream. The Conference AS also supports floor control to coordinate the access to these resources. Floor control is performed between the UE and the MRFP using BFCP (Binary Floor Control Protocol). The Conference AS is involved in content sharing and the establishment of the floor control channel by monitoring specific policy rules and set floor specific identities to use between the client and MRFP.

The Scheduled Conferencing service provides the following individual policies to be defined per conference by the CO:

- **Available media:**
The media types allowed in the conference. Audio only or audio + video or audio + video + application where application stream is used for conference floor control.
Change of this policy during a traffic session takes effect only the next time the session is initiated.
- **Number of participants:**
The maximum number of allowed participants in the conference.
When the 'Wait for moderator' policy is active, the conference focus reserves one participant resource for the moderator, until the first moderator joins.
Example: A conference with the number of participant policy set to value nine, accepts attendance of eight ordinary participants and one moderator.
The 'Number of participants' policy is also considered when the CO invites a user to a conference via the CCMP interface.
When the CO invites a user to a conference via the CCMP interface as the first participant, the conference is activated automatically and no room is reserved for the moderator.
Change of this policy during a traffic session takes effect only the next time the session is initiated.
- **Wait for moderator:**
Having a precondition on the conference that the moderator must join before open media connectivity between conference participants.
The moderator precondition is fulfilled once any CP joins using the moderator PIN code or conference is activated by a CO initiated dial-out.
A pre-defined 'wait-for-moderator' announcement will be played to all participants until the moderator joins.
Change of this policy during a traffic session takes effect only the next time the session is initiated.
- **Allow dial-in for non-moderators:**
Any dial-in attempts to join to the conference with participant PIN will be responded with an error code, if the dial-in for non-moderators is not allowed.
Update to this policy item is enforced by the focus immediately, even on active traffic instance.



2.2.2 Charging

The scheduled conference service supports offline (Rf) scheduled conference focus session based charging, for more details check Ref [20] .

In case of failed attempts to join to a scheduled conference, offline (Rf) one time event charging is used.

Offline (Rf) one time event charging is also used at creation and deletion of the scheduled conference room over the CCMP interface.

The conference owner is used to populate the Subscription-Id AVP in the charging messages generated for the conference session, and for the failed attempts to join to the scheduled conference owned by the conference owner.

When the conference owner cannot be determined (e.g. wrong PIN is provided) the service number is used to populate the Subscriber-Id AVP.

The conference focus gets the charging function address information configured against the conference owner from the HSS. The information is used when sending charging messages from the conference focus.

When the conference owner cannot be determined, the default charging function address is used.

The following service specific AVPs are applicable to scheduled conference charging:

- a. Supplementary Service Information – indicating conference creation/conference deletion/conference update/conference completion/participant join/participant leave/start of mixing/participant addition/participant removal/participant update at the focus.
- b. Conference Id (i.e. the SIP conference URI) – included in charging messages generated at each traffic instance of the focus.
- c. XCON Id (i.e. XCON object identity) – included in all charging messages generated at for the focus.
- d. Related ICID (the conference ICID generated for the focus session, and it can be used as charging data correlation anchor point)– included in charging messages generated at each traffic instance of the focus
- e. CCMP User Info – included in charging messages generated upon participant update triggered over the CCMP interface.

2.2.3 Example Call Flow

2.2.3.1 Create Scheduled Conference

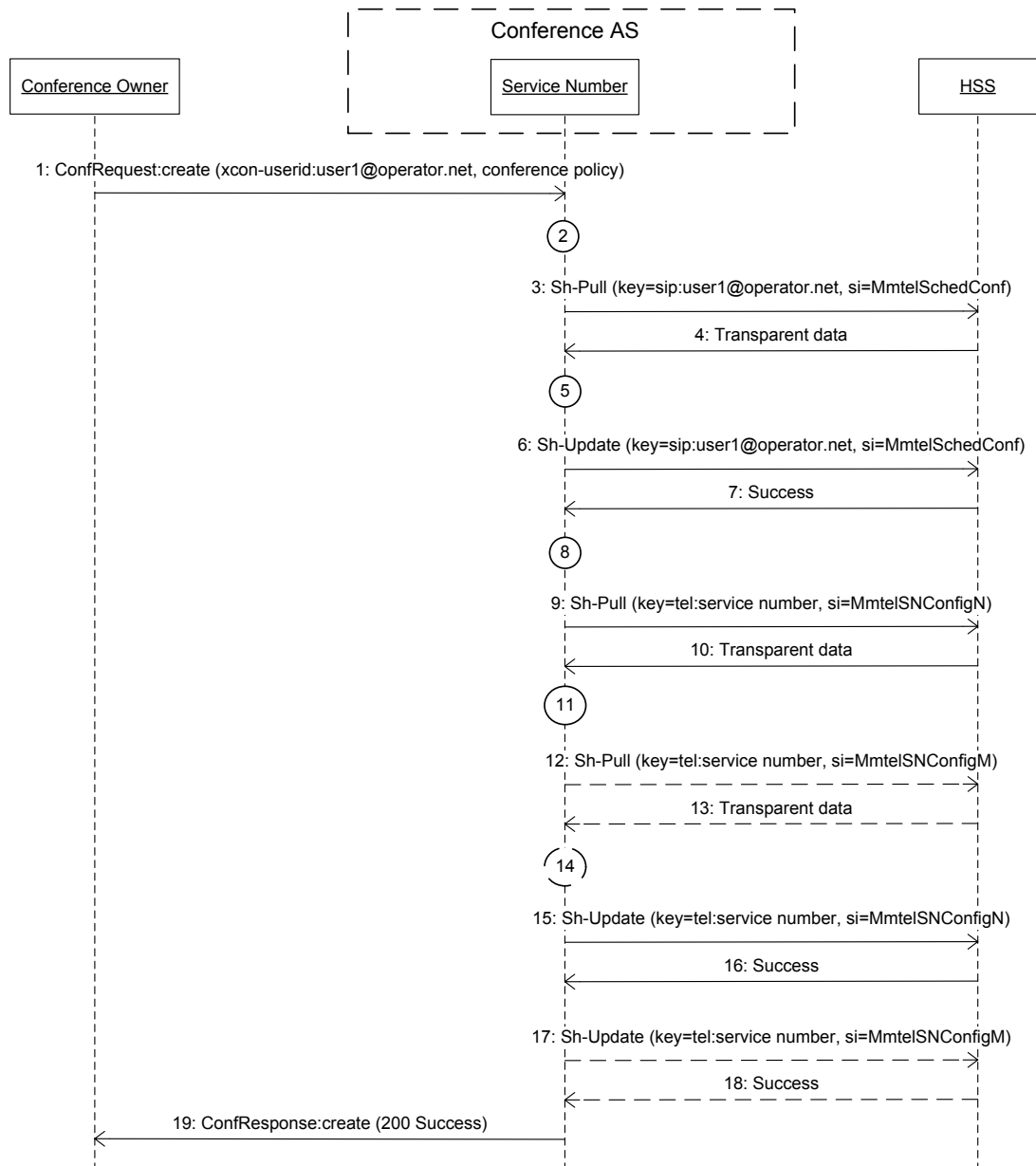


Figure 1 Create scheduled conference resource

1. The Conference Owner (CO) requests creation of a conference focus via the external CAS. The request includes the public identity of the CO together with the conference information document.
2. The administrative state of the CCMP interface is checked together with the availability of a valid Multiparty Conf license. A validation of the conference information document is performed. In case this validation fails the request will be responded with an error code.
3. Scheduled conference service data of the CO is fetched.



4. Response received from HSS.
5. The service data of the CO is verified. If the Scheduled Conference service is either in state inactive or if the limit for maximum number of allowed conference focus resources per CO has been reached, the request will be rejected with an error code.
6. The new conference focus is stored in the service data of the CO.
7. HSS response received.
8. The PIN codes defined for the conference focus are analyzed to find which of the reference table(s) of the service number that shall be updated. If both PIN codes end up in the same table then sequence 12-14, 17-18 are omitted.
9. Fetch the reference table to update.
10. HSS response received.
11. Add the 'PIN to conference owner'-reference and check if this new reference fits within the size limitation of the reference table. If the size limit is exceeded, the create request is responded with an error code.
12. Fetch the reference table to store the second PIN code. (Not performed in case both PIN codes end up in the same table).
13. HSS response received.
14. Add the second 'PIN to conference owner'-reference and check if this new reference fits within the size limitation of the reference table. If the size limit is exceeded, the create request is responded with an error code.(Not performed in case both PIN codes end up in the same table).
15. The updated reference table of the service number is stored in HSS.
16. HSS response received.
17. The updated reference table holding the second PIN code of the service number is stored in HSS. (Not performed in case both PIN codes end up in the same table).
18. HSS response received.
19. The successful create request is responded

2.2.3.2 Dial in to scheduled conference

The use case shows the sequence when a user dials-in to a scheduled conference which does not have any moderator policy assigned. The request URI of the incoming INVITE specifies the TEL URI of an existing Service Number.

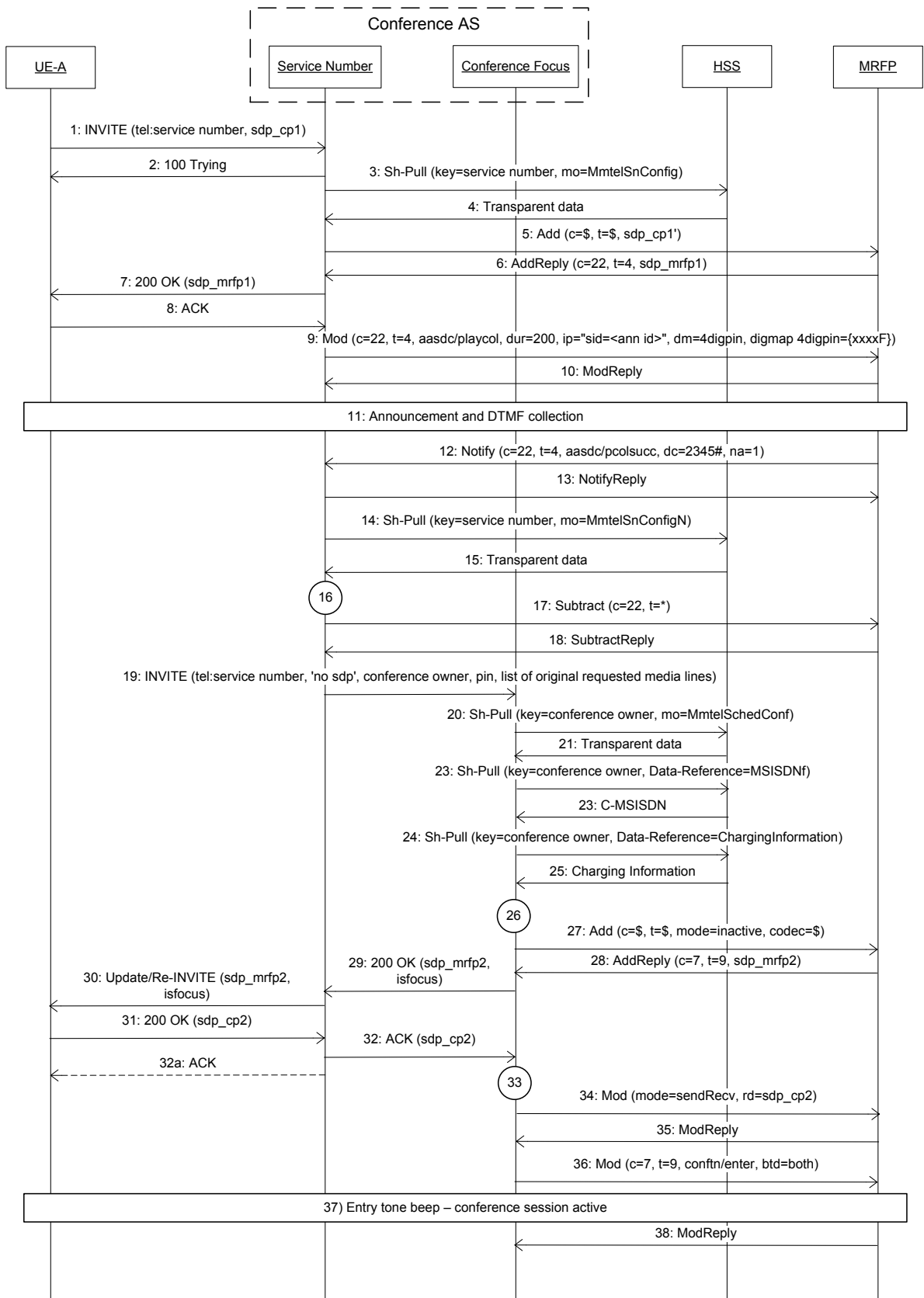


Figure 2 Join scheduled conference without moderator policy



1. UE-A has been invited to a scheduled conference and sends an INVITE to the service number. The request includes the SDP offered by the UE.
2. 100 Trying response from the service number.
3. The service number configuration (transparent data) is read from HSS unless already cached in memory. This service number information includes announcements to play out, PIN code length etc.
4. HSS response with service number information.
5. The Conference AS requests the MRFP to allocate a media resource to be used for PIN code retrieval. Only an audio stream is needed for play-collect.
6. MRFP response including the MRFP SDP answer.
7. A 200 OK response including the SDP answer of the MRFP is sent back to the UE. All streams except the audio streams are disabled. The 200 OK also includes the service number URI.
8. ACK acknowledge received from the client.
9. The MRFP is requested to initiate a play-collect operation towards the UE. The request defines the announcement to play and digitmap used to validate the PIN code provided by the UE. In this example, a four digit code ending with a '#'-sign.
10. MRFP response.
11. The announcement is played towards the UE with DTMF digit collection enabled. In this example a valid digit sequence was received.
12. MRFP notifies the Conference AS about the successful play-collect operation. The received digit sequence is provided.
13. The Conference AS sends a notify response.
14. Considering the received PIN code, the relevant reference table of the service number (transparent data) is fetched from HSS unless the information is already cached in memory.
15. HSS response received.
16. The service number checks that the received PIN code matches a valid scheduled conference and if so gets the public identity of conference owner.
17. The termination used for the play-collect operation is subtracted in the MRFP.
18. MRFP subtract response received.
19. The service number sends an INVITE request to the conference focus instance including identity of the conference resource, the time stamp of reception of the original INVITE in the service number, the list of originally requested media types, the preferred IP version, and the preferred



Audio/Video profile for video streams. The INVITE does not include SDP. The INVITE is sent internally within the scheduled conference server.

20. The conference focus reads the conference policy to apply from HSS (transparent service data of the conference owner) unless already cached in memory.
21. HSS response received.
22. The conference focus reads the C-MSISDN from HSS (non-transparent data of the conference owner).
23. HSS response received.
24. The conference focus reads the Charging Information from HSS (non-transparent data of the conference owner).
25. HSS response received.
26. The policies of the conference focus are analyzed. In this example there are no policies that prevent the UE from being connected to the conference.
27. The Conference AS requests the MRFP to provide an offer for the UE based on the list of the original requested media types, but also in line with the media policy of the conference. Mode set to inactive. The preferred IP version and the preferred Audio/Video profile for video streams are also taken in consideration. Mode set to inactive.
28. The MRFP responds with a SDP offer.
29. A 200 OK response including the SDP offer is sent to the UE. The 200 OK also includes the conference URI and the 'isFocus' feature parameter in the Contact header.
30. The service number re-negotiates the focus offer with the client. An UPDATE is sent in this example including the SDP offer (with all the media streams received in the initial INVITE), with the conference URI and the 'isFocus' feature parameter in the Contact header. (re-INVITE may also be sent in case UPDATE is not supported by the UE)
31. The UE responds with an SDP answer in 200 OK.
32. The service number forwards the SDP answer in the ACK sent to the focus.
If re-INVITE was used instead of UPDATE, MTAS sends ACK also to the UE.
33. Rf: ACR[start] generated if the participant was the first one to join, otherwise ACR[interim], with the CO in the Subscription-Id AVP .
34. The MRFP is updated with the SDP answer.
35. Modify reply received from MRFP.



36. The Conference AS requests the MRFP to play a conference entrance tone to indicate to all participants of the conference that a new participant has joined.
37. The tone is played to all participants.
38. MRFP response to the tone request is received.

2.2.3.3 Conference Owner kicks out a participant

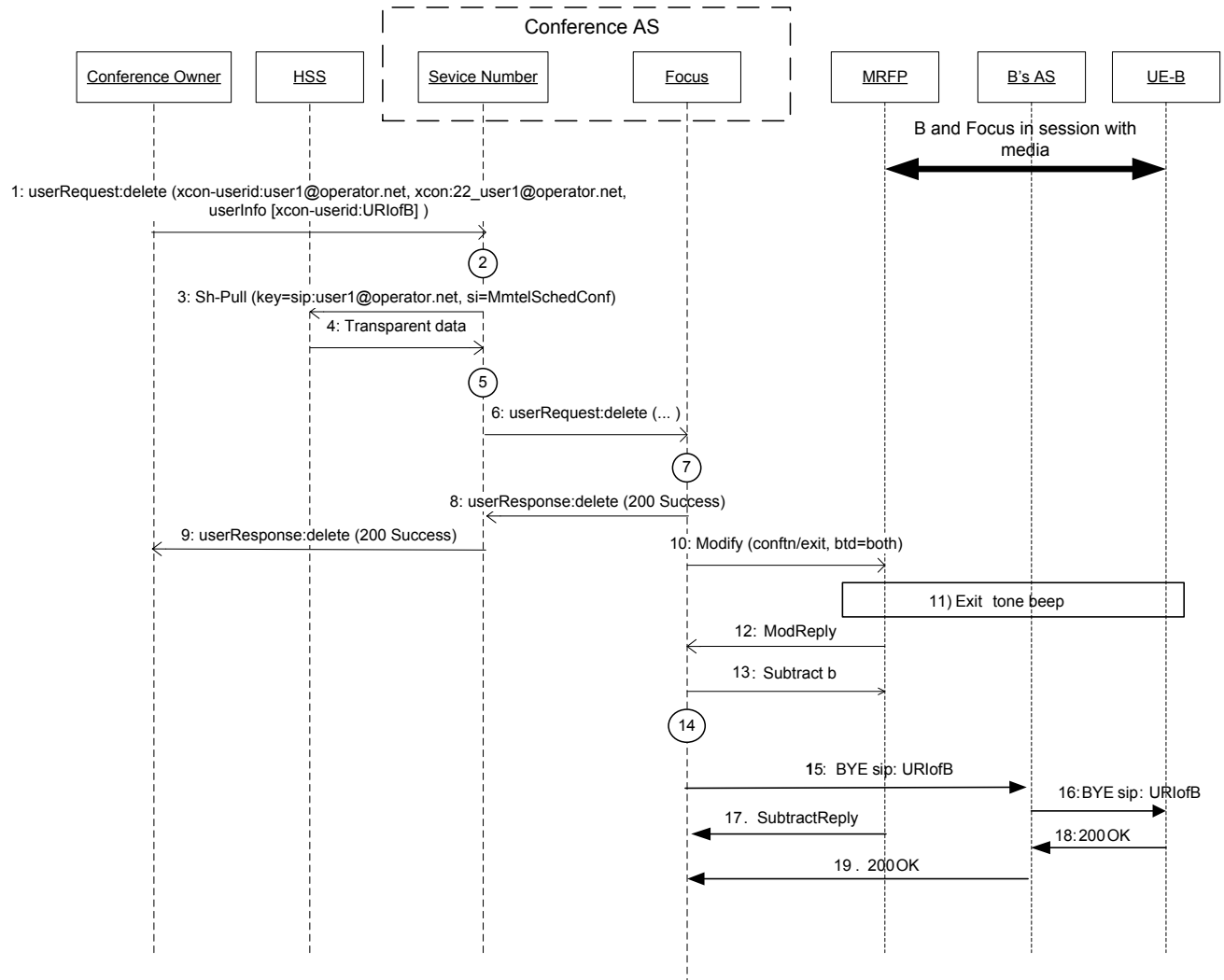


Figure 3 Conference Owner removes a CP from the conference

There is an active conference between the Focus and one or more participants, including UE-B.

1. The Conference Owner (CO) requests to kick-out a specific participant of a specific conference. The request includes the public identity of the CO together with the conference focus identity and the UserInfo including the target participant identity.



2. The administrative state of the CCMP interface and of the In Conference Control feature is checked. If any of them is locked the request is responded with an error code.
The availability of a valid Multiparty Conf license and of a valid In Conference Control license is checked. If any of them is missing, the request is responded with an error code.
3. The service data of the CO is fetched from HSS
4. HSS response.
5. Data of the requested conference focus is read. In case the service of the CO is inactive the request is responded with an error code. In case no conference focus exists with the requested identity (XCON-ID) the request is responded with an error code.
6. The user update request is sent to the conference focus.
7. The focus executes further validation on the request. If no active conference instance is found or the Userinfo is invalid, the request is responded with an error code. When the target participant in the Userinfo is not a conference participant, the request is responded an error code.
8. The focus sends CCMP 200 OK response to the service number.
9. The service number sends CCMP 200 OK response to the Conference Owner.
10. The MRFP is requested to play an exit tone to all participants of the conference from the termination of the kicked out party.
11. Exit tone played to all participants.
12. MRFP response.
13. The focus issues Subtract towards the MRFP to remove the termination for the participant B.

Note that Subtract, ACR and BYE are sent in a sequence and the order of signals is not important.
14. The focus generates Rf: ACR[interim] for the scheduled conference focus charging session with the CO in the Subscription-Id AVP.
15. Without waiting for ACA, the focus sends a BYE request towards the UA B.
16. The BYE forwarded to UE B.
17. SubtractReply received from the MRFP indicating successful removal of the termination.
18. 200 OK from UE B
19. 200 OK towards the focus.



2.2.4 Service Interaction

2.2.4.1 Call hold/resume

The conference focus acts as a B party in a hold/resume scenario in regard to the signaling and media plane handling.

2.2.4.2 Communication Barring

The conference focus supports neither incoming communication barring (ICB) nor outgoing communication barring (ICB). Outgoing barring checks are executed in the originating Telephony AS of the CP.

2.2.4.3 OIR/TIR

The conference focus respects the privacy settings (OIR/TIR) of the CPs for retrieve conference information requests and in conference event notifications.

2.2.4.4 CDIV

The Service Number rejects diverted calls

2.2.5 Provisioning

The scheduled conference service configuration data of the subscriber (Conference Owner) contains:

- if a subscriber is allowed to use the scheduled conference service,
- the service number providing the service for the subscriber

The scheduled conference service configuration data of the service number contains:

- if a service number is ready for traffic operation,
- the welcome and pin code requesting announcement used when a participant enters the conference system,
- the retry announcement used when incorrect pin is entered,
- the hangup announcement used when the limit of number of attempts has been exceeded,
- the wait for moderator announcement used when the moderator has to join before the conference starts,
- the number of digits in the PIN code,
- the number of PIN code attempts allowed until the conference service shall hang up,



- if the Calling User is routed to Attendant when the maximum number of PIN code attempts exceeded,
- the announcement played when the limit of number of PIN code attempts has been exceeded and the Calling User has been routed to Attendant Assistance,
- the SIP or tel URI of the Attendant.

2.2.6 Configuration

The Scheduled Conferencing service share few configuration attributes with the Ad-hoc Conferencing service.

The O&M operator can configure the conference server with regard to:

- Administrative state (locked/unlocked/shutting down) (common with Ad-hoc Conference Service)
- Conference Service Number URI (only subdomain) (common with Ad-hoc Conference Service)
- Conference Focus URI (only userinfo prefix and subdomain name can be configured) (common with Ad-hoc Conference Service)
- Activate/deactivate the conference notification service (common with Ad-hoc Conference Service)
- The Charging Profile used for the Scheduled Conference charging
- Audio/Video profile used for video streams in the scheduled conference dial out offer (AVP/AVPF).
This configuration attribute is used for video streams also in the offer sent to the dial-in participants after PIN collection, when the participant's Audio/Video profile preference is not available.
- Administrative state of the CCMP interface (locked/unlocked)
- Administrative state of the In Conference Control feature (locked/unlocked)

2.2.7 Performance Management

The O&M operator can monitor the scheduled conference server in terms of performance:

- The number of dial in attempts per service number
- The number of successful dial in attempts per service number
- The number of unsuccessful dial in attempts per service number due to incorrect PIN code



- The number of unsuccessful dial in attempts per service number due to internal or external errors
- The number of simultaneous conference participants active in conference sessions per service number.
- The number of failed attempts to join a scheduled conference due to conference license problem
- The number CCMP operations, that resulted in a successful response. There is one counter for each specific CCMP request and operation combination.
- The number CCMP operations that that failed due to reasons external to the MTAS. There is one counter for each specific CCMP request and operation combination.
- The number CCMP operations that that failed due to reasons external to the MTAS. There is one counter for each specific CCMP request and operation combination.
- The number of the successful and unsuccessful calls from the Service Number to the Attendant.

2.3 Fault Management

MtasConf, Administrative State Locked (shared with Ad-hoc Conference)

MtasConf, In Conference Control License Absent



3 **Acronyms and Abbreviations**

| | |
|--------|---|
| 3GPP | 3rd Generation Partnership Project |
| AS | Application Server |
| CAS | Conference Administration Server |
| IETF | Internet Engineering Task Force |
| IMS | IP Multimedia Subsystem |
| MMTel | Multi-Media Telephony |
| MO | Mobile Originating call |
| MRFC | Media Resource Function Controller |
| MRFP | Media Resource Function Processor |
| MSISDN | Mobile Subscriber Integrated Service Digital Network |
| MTAS | Multimedia Telephony Application Server |
| RFC | Request for Comment |
| SDP | Session Description Protocol |
| SIP | Session Initiation Protocol |
| TISPAN | Telecoms & Internet converged Services & Protocols for Advanced Network |
| UA | User Agent |
| UE | User Equipment |
| URI | Uniform Resource Identifier |



4 Reference Documents

- [1] MTAS 15A Feature Description
- [2] 3GPP TS 24.147 - Conferencing using the IP Multimedia (IM) Core Network (CN) Subsystem
- [3] 3GPP TS 26.114 - Multimedia telephony; Media Handling and Interaction
- [4] 3GPP TS 29.333 – MRFC-MRFP Mp Interface; Stage 3
- [5] IETF RFC 3311 - The Session Initiation Protocol (SIP) UPDATE Method
- [6] IETF RFC 3261 - SIP: Session Initiation Protocol, Internet Engineering Task Force
- [7] IETF RFC 3264 - An Offer/Answer Model with Session Description Protocol (SDP)
- [8] IETF RFC 3323 - A Privacy Mechanism for the Session Initiation Protocol (SIP)
- [9] IETF RFC 3325 - Private Extensions to the Session Initiation Protocol (SIP) for Asserted Identity within Trusted Networks
- [10] IETF RFC 3515 - The Session Initiation Protocol (SIP) REFER Method
- [11] IETF RFC 3892 - The Session Initiation Protocol (SIP) Referred-By Mechanism
- [12] IETF RFC 3966 - The tel URI for telephone Numbers
- [13] IETF RFC 4244 - An Extension to the Session Initiation Protocol (SIP) for Request History Information
- [14] IETF RFC 4353 - A Framework for Conferencing with the Session Initiation Protocol (SIP)
- [15] IETF RFC 4566 - SDP: Session Description Protocol
- [16] IETF RFC 4585 - Extended RTP Profile for Real-time Transport Control Protocol (RTCP)-Based Feedback (RTP/AVPF)
- [17] 3GPP TS 23.218 - IP Multimedia (IM) session handling
- [18] 3GPP TS 23.228 - IP Multimedia Subsystem (IMS)
- [19] IETF RFC 4240 - Basic Network Media Services with SIP
- [20] MTAS 15A Technical Product Description ---- Common Features