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Contents

Intellectual Property Rights 2
Foreword 2
Foreword 6
1 Scope 7
2 References 7
3 Definitions, symbols and abbreviations 9
3.1 Definitions 9
3.2 Abbreviations 10
4 Conferencing overview 10
5 Protocol using SIP and SIP events for conferencing 12
5.1 Introduction 12
5.2 Functional entities 12
5.2.1 User Equipment (UE) 12
5.2.2 Media Resource Function Controller (MRFC) 12
5.2.3 Conferencing Application Server (AS) 12
5.2.4 Media Gateway Control Function (MGCF) 12
5.3 Role 12
5.3.1 Conference Participant 12
5.3.1.1 General 12
5.3.1.2 Subscription for conference event package 12
5.3.1.3 Conference creation 13
5.3.1.3.1 General 13
5.3.1.3.2 Conference creation with a conference factory URI 13
5.3.1.3.3 Three-way session creation 13
5.3.1.4 Joining a conference 14
5.3.1.4.1 User joining a conference by using a conference URI 14
5.3.1.4.2 User joining a conference after receipt of a REFER request 14
5.3.1.5 Inviting other users to a conference 14
5.3.1.5.1 General 14
5.3.1.5.2 User invites other user to a conference by sending a REFER request to the other user 15
5.3.1.5.3 User invites other user to a conference by sending a REFER request to the conference focus 15
5.3.1.5.4 User invites other users to a conference by including URI list in initial INVITE request to the conference focus 15
5.3.1.6 Leaving a conference 16
5.3.1.6.1 Conference participant leaving a conference 16
5.3.1.6.2 Conference focus removes conference participant from a conference 16
5.3.1.6.3 Removing a conference participant from a conference 16
5.3.1.7 Consent to list server distribution 17
5.3.2 Conference Focus 17
5.3.2.1 General 17
5.3.2.2 Generic procedures for all conference related methods at the conference focus 17
5.3.2.2.1 Conference focus originating case 17
5.3.2.2.2 Conference focus terminating case 17
5.3.2.3 Conference creation 18
5.3.2.3.1 Conference creation with a conference factory URI 18
5.3.2.3.2 Conference creation with a conference URI 18
5.3.2.4 User joining a conference 18
5.3.2.4.1 User joining a conference by using a conference URI 18
5.3.2.5 Invitation of users to a conference 19
5.3.2.5.1 General 19
5.3.2.5.2 Request from a user to invite another user to a conference using a REFER request 19
5.3.2.5.3 Request from a user to invite another user to a conference using an INVITE request for conference creation 20

5.3.2.5.4 Inviting a user to a conference by sending an INVITE request 20
5.3.2.5.5 Inviting a user to a conference by sending a REFER request 21
5.3.2.6 Leaving a conference 21
5.3.2.6.1 Conference participant leaving a conference 21
5.3.2.6.2 Removing a conference participant from a conference 21
5.3.2.7 Conference termination 22
5.3.3 Conference Notification Service 23
5.3.3.1 General 23
5.3.3.2 Subscription to conference event package 23
5.3.3.3 Leaving a conference 23
5.3.3.4 Conference termination 23

6 Protocol using SDP for conferencing 23
6.1 Introduction 23
6.2 Functional entities 23
6.2.1 User Equipment (UE) 23
6.2.2 Media Resource Function Controller (MRFC) 23
6.2.3 Conferencing Application Server (Conferencing AS) 24
6.2.4 Media Gateway Control Function (MGCF) 24
6.3 Role 24
6.3.1 Conference Participant 24
6.3.2 Conference Focus 24

7 Void. 25

8 Protocol for floor control for conferencing 25
8.1 Introduction 25
8.2 Functional entities 25
8.2.1 User Equipment (UE) 25
8.2.2 Media Resource Function Processor (MRFP) 25
8.3 Role 25
8.3.1 Floor participant 25
8.3.2 Floor chair 25
8.3.3 Floor control server 25

Annex A (informative): Example signalling flows of conferencing operation 26

A.1 Scope of signalling flows 26

A.2 Introduction 26
A.2.1 General 26
A.2.2 Key required to interpret signalling flows 26
A.2.3 Overview of signalling flows related to PSI routeing 26

A.3 Flows demonstrating the creation of a conference 28
A.3.1 Introduction 28
A.3.2 User automatically creating a conference with a conference factory URI 28
A.3.2.1 MRFC/AS is located in user's home network 28
A.3.2.2 MRFC/AS is not located in user's home network 46
A.3.3 User automatically creating a conference with a conference URI 66
A.3.4 User creating a conference by manually dialling 67
A.3.5 User creating a conference from two existing connections (Three-way session), users in different networks 67
A.3.6 User automatically creating a conference with a conference factory URI and inviting some users to the newly-created conference 67

A.4 Flows demonstrating a user joining a conference 84
A.4.1 Introduction 84
A.4.2 User calling into a conference 85
A.4.2.1 MRFC/AS is not located in user's home network 85
A.4.2.1.1 Conference URI resolved by the terminating home network 85
A.4.2.1.2 Conference URI can be resolved by the originating home network 110
A.4.3 User getting invited to a conference 127
A.4.3.1 MRFC/AS is not located in user's home network 127

A.4.3.1.1 Conference Participant referring another user to a conference 127
A.4.3.1.2 User getting referred to a conference by a conference participant 137
A.4.3.1.3 MRFC/AS invites a user to a conference 146
A.4.3.1.4 MRFC/AS refers a user to a conference 166
A.4.4 User requesting IMS to join another user 177
A.4.4.1 MRFC/AS is located in user's home network 177
A.4.5 User joins a private conversation to a conference 185
A.4.5.1 User in a different network 185

A.5 Flows demonstrating a user subscribing to the conference event package 185
A.5.1 Introduction 185
A.5.2 User subscribing to the conference event package 186
A.5.2.1 MRFC/AS is not located in user's home network 186

A.6 Flows demonstrating a user leaving a conference 192
A.6.1 Introduction 192
A.6.2 User leaving the conference 192
A.6.2.1 MRFC/AS is located in user's home network 192
A.6.3 User requesting to remove another user from conference 198
A.6.4 MRFC/AS drops a user from a conference 198
A.6.4.1 MRFC/AS is located in user's home network 198

A.7 Flows demonstrating conference termination 201
A.7.1 General 201

A.8 Flows demonstrating usage of hold and resume during conferences 201

A.9 Flows demonstrating the use of the Replaces header 202
A.9.1 POTS subscriber invited to a conference 202

Annex B (informative): Change history 207

History 209

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document provides the protocol details for conferencing within the IP Multimedia Core Network subsystem (IMS) based on the Session Initiation Protocol (SIP), SIP Events, the Session Description Protocol (SDP) and the Binary Floor Control Protocol (BFCP).

The functionalities for conference policy control (with respective standardised protocols) are felt to be essential for a complete IMS conferencing service but are not specified in this version of IMS conferencing and are for further study.

The present document does not cover the signalling between a MRFC and a MRFP.

Where possible, the present document specifies the requirements for this protocol by reference to specifications produced by the IETF within the scope of SIP, SIP Events, SDP and BFCP, either directly, or as modified by 3GPP TS 24.229. Where this is not possible, extensions to SIP are defined within the present document. The document has therefore been structured in order to allow both forms of specification.

The present document is applicable to Application Servers (ASs), Multimedia Resource Function Controllers (MRFCs), Multimedia Resource Function Processors (MRFP), Media Gateway Control Functions (MGCFs) and to User Equipment (UE) providing conferencing capabilities.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 22.228: "Service requirements for the Internet Protocol (IP) multimedia core network subsystem; Stage 1".

[3] 3GPP TS 23.218: "IP Multimedia (IM) session handling; IM call model; Stage 2".

[4] 3GPP TS 24.228 Release 5: "Signalling flows for the IP multimedia call control based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[5] 3GPP TS 24.229: "Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[6] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[7] IETF RFC 3261 (June 2002): "SIP: Session Initiation Protocol".

[8] IETF RFC 4353 (February 2006): "A Framework for Conferencing with the Session Initiation Protocol (SIP)".

[9] IETF RFC 4579 (August 2006): "Session Initiation Protocol Call Control - Conferencing for User Agents".

[10] IETF RFC 3265 (June 2002): "Session Initiation Protocol (SIP) - Specific Event Notification".

[11] IETF RFC 4575 (August 2006): "A Session Initiation Protocol (SIP) Event Package for Conference State".

[12] 3GPP TS 29.228: "IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents".

[13] Void.

[14] Void.

[15] 3GPP TS 29.208: "End to end Quality of Service (QoS) signalling flows".

[16] IETF RFC 2833 (May 2000): "RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals".

[17] IETF RFC 3515 (April 2003): "The Session Initiation Protocol (SIP) Refer Method".

[18] Void.

[19] IETF RFC 3840 (August 2004): "Indicating User Agent Capabilities in the Session Initiation Protocol (SIP)".

[20] IETF RFC 3892 (September 2004): "The Session Initiation Protocol (SIP) Referred-By Mechanism".

[21] Void.

[22] Void.

[23] Void.

[24] Void.

[25] Void.

[26] Void.

[27] Void.

[28] IETF RFC 4582 (November 2006): "The Binary Floor Control Protocol (BFCP)".

[29] Void.

[30] Void.

[31] Void.

[32] Void.

[33] IETF RFC 3891 (September 2004): "The Session Inititation Protocol (SIP) "Replaces" Header".

[34] IETF RFC 5366 (October 2008): "Conference Establishment Using Request-Contained Lists in the Session Initiation Protocol (SIP)"

[35] IETF RFC 4583 (November 2006): "Session Description Protocol (SDP) Format for Binary Floor Control Protocol (BFCP) Streams".

[36] IETF RFC 5360 (October 2008): "A Framework for Consent-Based Communications in the Session Initiation Protocol (SIP)".

[37] draft-kaplan-sip session-id-02 (March 2009): "A Session Identifier for the Session Initiation Protocol (SIP)".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[38] 3GPP TS 24.166: "3GPP IMS Conferencing Management Object (MO)".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 21.905 [1], and the following apply:

Conferencing AS: an Application Server that supports functionality specific to a SIP conference focus

Ad-hoc conference: An unscheduled conference that is created on-the-fly by a conference participant.

The following terms and definitions given in 3GPP TS 23.228 [2] apply (unless otherwise specified):

Public Service Identity
Three-way session

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.228 [6] subclauses 4.3.3.1 and 4.6 apply:

IP-Connectivity Access Network (IP-CAN)

The following terms and definitions given in RFC 4353 [8] apply (unless otherwise specified):

Conference
Conference-Aware Participant
Conference notification service
Conference Policy
Conference-Unaware Participant
Conference URI
Focus
Mixer
Participant
Tightly Coupled Conference

The following terms and definitions given in RFC 4579 [9] apply (unless otherwise specified):

Conference Factory URI

For the purposes of the present document, the following terms and definitions given in RFC 3840 [19] apply:

Feature parameter

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.002 [2] subclauses 4.1.1.1 and 4a.7 apply:

Call Session Control Function (CSCF)
Home Subscriber Server (HSS)
Media Gateway Control Function (MGCF)
Multimedia Resource Function Controller (MRFC)
Multimedia Resource Function Processor (MRFP)

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.218 [5] subclause 3.1 apply:

Filter criteria
Initial filter criteria
Initial request
Subsequent request

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.228 [7] subclauses 4.3.3.1 and 4.6 apply:

Interrogating-CSCF (I-CSCF)

Proxy-CSCF (P-CSCF)
Public user identity
Serving-CSCF (S-CSCF)

For the purposes of the present document, the following terms and definitions given in 3GPP TR 21.905 [1] apply:

User Equipment (UE)

For the purposes of the present document, the following terms and definitions given in RFC 4582 [28] apply:

Floor
Floor chair
Floor control server
Floor participant

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AMR	Adaptive Multi-Rate
AS	Application Server
BFCP	Binary Floor Control Protocol
CN	Core Network
CSCF	Call Session Control Function
FQDN	Fully Qualified Domain Name
HSS	Home Subscriber Server
I-CSCF	Interrogating CSCF
IM	IP Multimedia
IMS	IP Multimedia CN subsystem
IP	Internet Protocol
IP-CAN	IP-Connectivity Access Network
MGCF	Media Gateway Control Function
MRFC	Multimedia Resource Function Controller
MRFP	Multimedia Resource Function Processor
P-CSCF	Proxy CSCF
PSI	Public Service Identity
S-CSCF	Serving CSCF
SDP	Session Description Protocol
SIP	Session Initiation Protocol
TLS	Transport Layer Security
UE	User Equipment

4 Conferencing overview

The basic services for the IP Multimedia core network Subsystem (IMS), as defined in 3GPP TS 24.229 [5], allow a user to initiate, modify and terminate media sessions based on the Session Initiation Protocol, as defined in RFC 3261 [7]. Although these basic mechanisms already allow multi party calls, more sophisticated services for communication between multiple parties can be made available by the network.

The conferencing service provides the means for a user to create, manage, terminate, join and leave conferences. It also provides the network with the ability to give information about these conferences to the involved parties.

The network operator or the user may apply membership and media policies to a conference. The functionality for conference policy control (with a respective standardised protocol) is felt to be essential for a complete IMS conferencing service but is not specified in this version of IMS conferencing and is for further study.

Conferencing applies to any kind of media stream by which users may want to communicate, this includes e.g. audio and video media streams as well as instant message based conferences or gaming. Floor control, as part of the conferencing service offers control of shared conference resources at the MRFP using BFCP.

The framework for SIP conferences is specified in RFC 4353 [8].

The architecture for the 3GPP conference service is specified in 3GPP TS 23.228 [6] and 3GPP TS 23.218 [3].

The present document specifies the usage of SIP, SDP and BFCP to realize 3GPP conference service based on the protocols specified by the IETF defined conference service as per RFCs listed in clause 2. However, since the IETF conference service has various scenarios and features as described in RFC 4353 [8], 3GPP conference service is a subset of the above IETF defined conference service.

Loosely coupled conferencing is outside the scope of this release of the IMS conferencing service.

The following figure depicts the functional split for SIP based conferences between the AS, the MRFC and the MRFP.

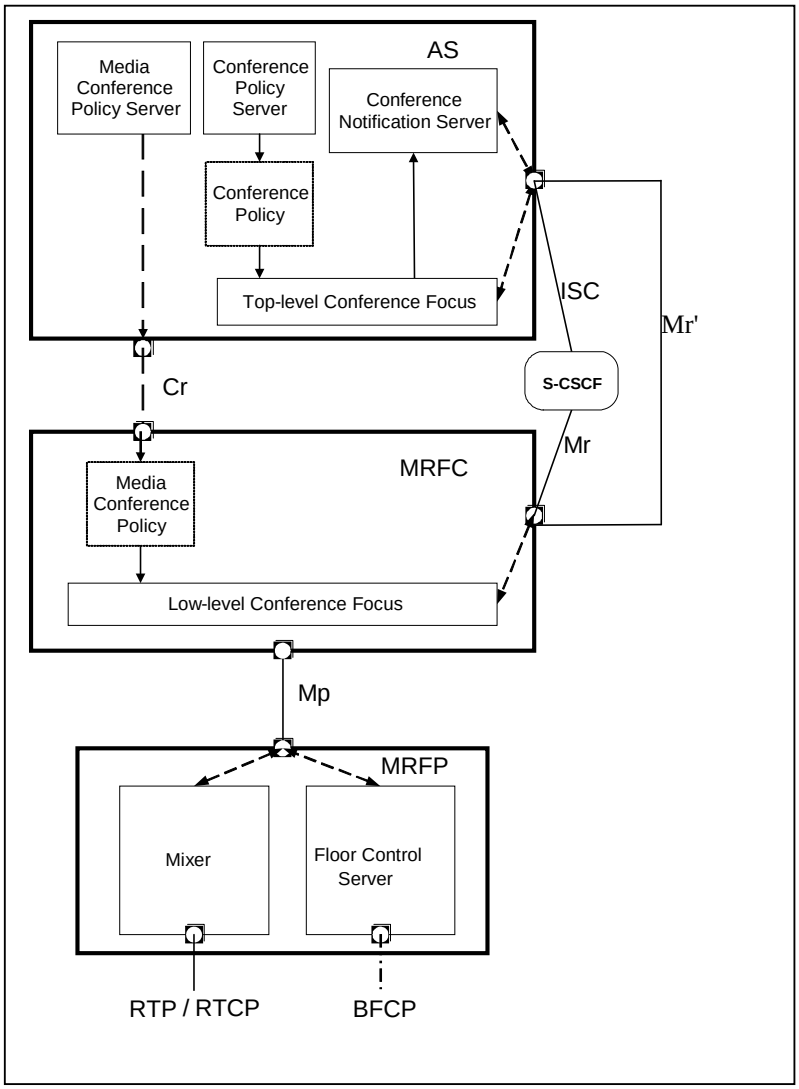

Figure 4.1: Functional split between the AS, MRFC and MRFP

The conference policy, conference notification server and top-level focus as specified in RFC 4353 [8] subclause 6 are located in the AS.

The MRFC has a conference policy and focus as specified in RFC 4353 [8] subclause 6.3.

The mixer and floor control server are located in the MRFP.

5 Protocol using SIP and SIP events for conferencing

5.1 Introduction

Void

5.2 Functional entities

5.2.1 User Equipment (UE)

For the purpose of SIP based conferences, the UE shall implement the role of a Conference participant as described in subclause 5.3.1.

5.2.2 Media Resource Function Controller (MRFC)

For the purpose of SIP based conferences, the MRFC shall support the procedures for ad-hoc conferencing as described in subclause 5.8 of 3GPP TS 24.229 [5] and the procedures for media control of ad-hoc conferencing described in subclause 10.3 of 3GPP TS 24.229 [5]

For the purpose of SIP based conferences, the MRFC shall regard the MRFP as a mixer, as described in RFC 4353 [8].

5.2.3 Conferencing Application Server (AS)

For the purpose of SIP based conferences, the conferencing AS shall implement the role of a conference focus, as described in subclause 5.3.2 and as a conference notification service, as described in subclause 5.3.3. The conferencing AS may implement the role of a conference participant as described in subclause 5.3.1.

The conferencing AS shall use the procedures for 3rd party call control as described in subclause 5.7.5 of 3GPP TS 24.229 [5] and the procedures for media control in subclause 10.2 of 3GPP TS 24.229 [5] to implement SIP based conferences.

5.2.4 Media Gateway Control Function (MGCF)

For the purpose of SIP based conferences, the MGCF shall implement the role of Conference participant as described in subclauses 5.3.1.3.2, 5.3.1.4.1, 5.3.1.5.4, 5.3.1.6.1 and 5.3.1.6.2. In addition, MGCF shall implement the functions except the "REFER" function in subclause 5.3.1.3.3.

5.3 Role

5.3.1 Conference Participant

5.3.1.1 General

In addition to the procedures specified in subclause 5.3.1, the conference participant shall support the procedures specified in 3GPP TS 24.229 [5] appropriate to the functional entity in which the conference participant is implemented.

5.3.1.2 Subscription for conference event package

The conference participant may subscribeto the conference event package, as described in RFC 4575 [11].

5.3.1.3 Conference creation

5.3.1.3.1 General

A conference can be created by means of SIP, as described in subclause 5.3.1.3.2 or subclause 5.3.1.3.3.

NOTE: Additionally, creation of a conference can be provided by other means.

The conference participant shall make use of the procedures for session establishment as described in subclauses 5.1.2A and 5.1.3 of 3GPP TS 24.229 [5] when creating conferences by means of SIP.

5.3.1.3.2 Conference creation with a conference factory URI

Upon a request to create a conference with a conference factory URI, the conference participant shall:

1) generate an initial INVITE request in accordance with subclause 5.1.3.1 of 3GPP TS 24.229 [5]; and

2) set the request URI of the INVITE request to the conference factory URI.

On receiving a 200 (OK) response to the INVITE request with the "isfocus" feature parameter indicated in Contact header, the conference participant shall store the content of the received Contact header as the conference URI. In addition to this, the conference participant may subscribe to the conference event package as described in RFC 4575 [11] by using the stored conference URI.

NOTE 1: A conference participant can decide not to subscribe to the conference event package for conferences with a large number of attendees, due to, e.g. the signalling traffic caused by the notifications about users joining or leaving the conference.

NOTE 2: A conference can also be created with a conference URI. The procedures for this case at the conference participant are identical to those for joining a conference, as described in subclause 5.3.1.4.1. It is not assumed that the conference participant is aware that the conference gets created in this case.

NOTE 3: The UE can discover the conference factory URI from the Management Object as defined in 3GPP TS 24.166 [38]. Further discovery mechanisms for the conference factory URI are outside the scope of the present document.

5.3.1.3.3 Three-way session creation

When a user is participating in two or more SIP sessions and wants to join together two of these active sessions to a so-called three-way session, the user shall perform the following steps.

1) create a conference at the conference focus by sending an INVITE request with the conference factory URI for the three-way session towards the conference focus, as described in subclause 5.3.1.3.2;

2) decide and perform for each of the active sessions that are requested to be joined to the three-way session, how the remote user shall be invited to the three-way session, which can either be:

   a) by performing the procedures for inviting a user to a conference by sending an REFER request to the user, as described in subclause 5.3.1.5.2; or

   b) by performing the procedures for inviting a user to a conference by sending a REFER request to the conference focus, as described in subclause 5.3.1.5.3;

3) release the active session with the user, by applying the procedures for session release in accordance with RFC 3261 [7], provided that a BYE request has not already been received, after a NOTIFY request has been received, indicating that the user has successfully joined the three-way session, i.e. including:

   a) a body of content-type "message/sipfrag" that indicates a "200 OK" response; and,

   b) a Subscription-State header set to the value "terminated"; and,

4) treat the created three-way session as a normal conference, i.e. the conference participant shall apply the applicable procedures of subclause 5.3.1 for it.

5.3.1.4 Joining a conference

5.3.1.4.1 User joining a conference by using a conference URI

Upon generating an initial INVITE request to join a conference for which the conference URI is known to the conference participant, the conference participant shall:

1) set the request URI of the INVITE request to the conference URI; and

2) send the INVITE request towards the conferencing AS that is hosting the conference.

NOTE 1: The initial INVITE request is generated in accordance with 3GPP TS 24.229 [5].

NOTE 2: The conference participants can get the conference URI as described in subclause 5.3.1.4.2. Other mechanisms can also be used by the conference participant to become aware of the conference URI, but they are out of scope of this specification..

On receiving a 200 (OK) response to the INVITE request with the "isfocus" feature parameter indicated in Contact header, the conference participant shall store the contents of the received Contact header as the conference URI. In addition to that, the conference participant may subscribe to the conference event package as described in RFC 4575 [11] by using the stored conference URI.

NOTE 3: A conference participant can decide not to subscribe to the conference event package for conferences with a large number of attendees, due to the signalling traffic caused by the notifications about e.g. users joining or leaving the conference.

Upon receipt of an INVITE request that includes a Replaces header, the conference participant shall apply the procedures described in RFC 3891 [33] to the INVITE request.

5.3.1.4.2 User joining a conference after receipt of a REFER request

Upon receipt of a REFER request that either includes a Refer-To header which includes the "method" uri parameter set to INVITE or does not include the "method" URI parameter, the conference participant shall:

1) handle the REFER request in accordance with RFC 3515 [17];

2) perform the actions as described in subclause 5.3.1.4.1 for a user joining a conference; and

3) if the received REFER request included a Referred-By header, include the Referred-By header in accordance with RFC 3892 [20] in the INVITE request that is sent for joining the conference.

5.3.1.5 Inviting other users to a conference

5.3.1.5.1 General

Upon inviting other users to a conference, the conference participant has to decide which of the following procedures has to be applied:

1) inviting an user to a conference by sending a REFER request to the user directly, as described in subclause 5.3.1.5.2; or

2) inviting a user to a conference by sending a REFER request to the conference focus, as described in subclause 5.3.1.5.3; or

3) inviting one or more users to a conference by adding these users" SIP URIs to the INVITE request that is sent to the Conference focus to create the conference (see subclause 5.3.1.3.2) as described in subclause 5.3.1.5.4.

NOTE: Additionally, users can be invited to a conference by other means.

It is out of the scope of the present document, how the UE decides which of the above procedures shall be applied.

5.3.1.5.2 User invites other user to a conference by sending a REFER request to the other user

Upon generating a REFER request that is destined to a user in order to invite that user to a specific conference, the conference participant shall:

1) set the request URI of the REFER request to the address of the user who is invited to the conference;

2) set the Refer-To header of the REFER request to the conference URI of the conference that the other user shall be invited to, including the "method" URI parameter set to "INVITE" or omit the "method" parameter; and

NOTE: Other headers of the REFER request will be set in accordance with 3GPP TS 24.229 [5].

3) send the REFER request towards the user who is invited to the conference.

The UE may additionally include the Referred-By header to the REFER request and set it to the URI of the conference participant that is sending the REFER request.

Afterwards the UE shall treat incoming NOTIFY requests that are related to the previously sent REFER request in accordance with RFC 3515 [17] and may indicate the received information to the user.

5.3.1.5.3 User invites other user to a conference by sending a REFER request to the conference focus

Upon generating a REFER request that is destined to the conference focus in order to invite another user to a specific conference, the conference participant shall:

1) set the request URI of the REFER request to the conference URI to which the user is invited to;

2) set the Refer-To header of the REFER request to the SIP URI or tel URL of the user who is invited to the conference;

3) either include the "method" URI parameter with the value "INVITE" or omit the "method" URI parameter in the Refer-To header; and

NOTE: Other headers of the REFER request will be set in accordance with 3GPP TS 24.229 [5].

4) send the REFER request towards the conference focus that is hosting the conference.

The UE may additionally include the Referred-By header to the REFER request and set it to the URI of the conference participant that is sending the REFER request.

In case of an active session the UE may additionally include the Replaces header in the header portion of the SIP URI of the Refer-to header field of the REFER request. If the the user involved in the active session is identified by a tel URI, the UE shall convert the tel URI to an SIP URI as described in RFC 3261 [7] before including the Replaces header field. The included Replaces header field shall refer to the active dialog that is replaced by the ad-hoc conference. The Replaces header field shall comply with RFC 3891 [33].

Afterwards the UE shall treat incoming NOTIFY requests that are related to the previously sent REFER request in accordance with RFC 3515 [17] and may indicate the received information to the user.

5.3.1.5.4 User invites other users to a conference by including URI list in initial INVITE request to the conference focus

Upon generating an INVITE request that is destined to the conference focus in order to create a conference using a conference factory URI (see subclause 5.3.1.3.2) the UE may attach a message body to the request that includes a URI list as described in RFC 5366 [34]. In order to do this the UE shall follow the procedures in subclause 5.3.1.3.2 for creation of the INVITE request and, in addition, the conference initiator shall build a list of URIs in accordance with RFC 5366 [34] including the SIP URIs of all the users that are to be invited to the conference.

In case of an ad-hoc conference where the conference creator is already involved in a dialog with a user who shall be invited to the conference, the UE may add information of this dialog ID (Call-ID header field, From header field, To header field, and if available a Session-ID header field as described in draft-kaplan-sip-session-id [37]) to the URIs in

the URI list, according to the procedures for adding header fields ("?" mechanism) described in subclause 19.1.1 of RFC 3261 [7].

Once the INVITE request has been sent, the conference participant shall behave as described in subclause 5.3.1.3.2 once the 200 (OK) response to the INVITE is received.

5.3.1.6 Leaving a conference

5.3.1.6.1 Conference participant leaving a conference

When leaving a conference, the conference participant shall:

1) generate a BYE request on the dialog that was established when joining or creating the conference, in accordance to the procedures described in 3GPP TS 24.229 [5] and RFC 3261 [7];

2) if the conference participant is subscribed to the conference state event information of that conference, the conference participant shall not renew this subscription and let the related subscription timer expire. When a related NOTIFY request is received which does not include a Subscription-State header set to the value "terminated", the conference participant shall:

   a) wait for an implementation dependant time, if a related NOTIFY request with the Subscription-State header set to the value "terminated" is received; and

   b) afterwards, if no such NOTIFY request is received, unsubscribe from the conference state event information by performing the procedures as described in RFC 3265 [10] and RFC 4575 [11].

NOTE 1: A conference participant leaving a conference will cause the conference notification service to send a NOTIFY request with updated conference state information to all conference participants, including the participant who just left. Therefore the time between sending the BYE request and receiving the next NOTIFY request is very short. The conference participant does not immediately unsubscribe from the conference event package in order not to cause unnecessary traffic on the air interface.

NOTE 2: After the conference participant leaves the conference, it can receive NOTIFY requests that cross the BYE request sent by the conference participant. In this case, the NOTIFY request will not include a Subscription-State header with the value "terminated", as it was issued before the conference focus / conference notification service got aware of the conference participant leaving the conference. Due to this another NOTIFY request may be received within a short period of time (see NOTE 1), that carries the Subscription-State header set to "terminated".

5.3.1.6.2 Conference focus removes conference participant from a conference

Upon receipt of a BYE request on the dialog that was established when joining or creating a conference, the conference participant shall:

1) respond to the BYE request as described in 3GPP TS 24.229 [5] and RFC 3261 [7]; and

2) if the conference participant is subscribed to the conference state event information of that conference, perform the actions for not renewing the subscription to the conference state event information as described for the conference participant leaving a conference in subclause 5.3.1.6.1.

5.3.1.6.3 Removing a conference participant from a conference

Upon generating a REFER request to remove a conference participant from a conference, the removing conference participant shall:

1) set the request URI of the REFER request to the conference URI of the conference from which the conference participant shall be removed

2) set the Refer-To header of the REFER request:

   a) to the address of the conference participant who should be removed from the conference, including the "method" parameter set to "BYE', if a single conference participant should be removed from the conference.

If the address of conference participant is a global tel URI, it shall be converted to SIP URI as described in RFC 3261 [7]; or

b) to the conference URI and the 'method" parameter to 'BYE', if all conference participants shall be removed from the conference.

NOTE 1: Other headers of the REFER request will be set in accordance with 3GPP TS 24.229 [5].

NOTE 2: The removal of all conference participants from the conference will terminate the conference if the conference policy is set accordingly.

3) send the REFER request towards the conference focus that is hosting the conference.

Afterwards the removing conference participant shall treat incoming NOTIFY requests that are related to the previously sent REFER request in accordance with RFC 3515 [17] and may indicate the received information to the user.

NOTE: Additionally, a conference participant can be removed from a conference by other means.

5.3.1.7 Consent to list server distribution

A participant capable of receiving a request to join a conference should support the requirements of a recipient defined in RFC 5360 [36].

5.3.2 Conference Focus

5.3.2.1 General

In addition to the procedures specified in subclause 5.3.2, the conference focus shall support the procedures specified in 3GPP TS 24.229 [5] appropriate to the functional entity in which the conference focus is implemented. When performing 3rd party call control the conference focus shall follow the procedures of subclause 5.7.5 of 3GPP TS 24.229 [5].

5.3.2.2 Generic procedures for all conference related methods at the conference focus

5.3.2.2.1 Conference focus originating case

The conference focus shall follow the procedures of 3GPP TS 24.229 [5] subclause 5.7.3 when acting as an originating UA.

5.3.2.2.2 Conference focus terminating case

Upon receipt of a conference related initial request, the conference focus shall follow the procedures of 3GPP TS 24.229 [5] subclause 5.7.1.2 in relation to the contents of the P-Charging-Function-Addresses header and the P-Charging-Vector header.

When creating the first response for this initial request, the conference focus shall:

1) include the P-Charging-Vector header including:

   a) the value of the icid parameter as received in the initial request;

   b) the value of the orig-ioi parameter as received in the initial request; and

   c) the term-ioi parameter, indicating the network of the conference focus; and

2) include the P-Charging-Function-Addresses header as received in the initial request or, if the P-Charging-Function-Addresses header was not received in the initial request, indicate the values applicable for the conference in the P-Charging-Function-Addresses header.

When creating responses for an initial INVITE request, the conference focus shall additionally send the 200 (OK) response to the initial INVITE request only after the resource reservation has been completed.

5.3.2.3 Conference creation

5.3.2.3.1 Conference creation with a conference factory URI

Upon receipt of an INVITE request that includes a conference factory URI in the request URI, the conference focus shall:

1) check if the conference factory URI is allocated and reject the request in accordance with RFC 3261 [7] if it is not allocated. The following actions in this subclause shall only be performed if the conference factory URI is allocated;

NOTE: The mechanism by which the conference focus gets aware whether a URI is a conference factory URI is out of the scope of the present document. One possibility would be that an operator uses a specific user part (e.g. conference-factory@home1.net) or host part (e.g. conference-factory.home1.net) for identification of conference factory URIs.

2) verify the identity of the user as described in subclause 5.7.1.4 of 3GPP TS 24.229 [5] and authorize the request as described in subclause 5.7.1.5 of 3GPP TS 24.229 [5]. The following actions in this subclause shall only be performed if the request can be authorized;

3) allocate a conference URI and if needed a temporary conference URI; and

4) if "preconditions" were indicated as required in the INVITE request are not satisfied, generate a first provisional response to the INVITE request, indicating the temporary conference URI in the Contact header if allocated, else the conference URI.

At the same time, resources will also be requested from the mixer.

If the conference focus generates any 1xx or 2xx response to the INVITE request, the conference focus shall include the "isfocus" feature parameter in accordance with the procedures of RFC 3840 [19].

Upon receipt of an indication from the mixer that conference resources have been through-connected, the conference focus shall generate a 200 (OK) response to the INVITE request, indicating the "isfocus" feature parameter as a parameter to the conference URI in the Contact header.

5.3.2.3.2 Conference creation with a conference URI

Upon receipt of an INVITE request that includes a conference URI in the request URI and the conference has not been created yet, the conference focus shall:

1) check if the conference URI is allocated reject the request in accordance with RFC 3261 [7] if it is not allocated. The following actions in this subclause shall only be performed if the conference URI is allocated;

2) verify the identity of the user as described in subclause 5.7.1.4 of 3GPP TS 24.229 [5] and authorize the request as described in subclause 5.7.1.5 of 3GPP TS 24.229 [5]. The following actions in this subclause shall only be performed if the request can be authorized; and

3) if a contact header is included in the response, set the contact header to the conference URI. At the same time, resources will also be requested from the mixer.

If the conference focus generates any 1xx or 2xx response to the INVITE request, the conference focus shall include the "isfocus" feature parameter in accordance with the procedures of RFC 3840 [19].

Upon receipt of an indication from the conference mixer that conference resources have been through-connected, the conference focus shall generate a 200 (OK) response to the INVITE request, indicating the conference URI in the Contact header.

5.3.2.4 User joining a conference

5.3.2.4.1 User joining a conference by using a conference URI

Upon receipt of an INVITE request that includes a conference URI in the request URI, the conference focus shall:

1) check if the conference URI is allocated. If the conference URI is not allocated, the conference focus shall reject the request in accordance with RFC 3261 [7]. The following actions in this subclause shall only be performed if the conference URI is allocated;

2) verify the identity of the user as described in subclause 5.7.1.4 of 3GPP TS 24.229 [5] and authorize the request as described in subclause 5.7.1.5 of 3GPP TS 24.229 [5]. The following actions in this subclause shall only be performed if the request can be authorized; and

3) if a contact header is included in the response, set the contact header to the conference URI.

At the same time, resources will also be requested from the mixer.

If the conference focus generates any 1xx or 2xx response to the INVITE request, the conference focus shall include the "isfocus" feature parameter in accordance with the procedures of RFC 3840 [19].

Upon receipt of an indication from the mixer that conference resources have been through-connected, the conference focus shall generate a 200 (OK) response to the INVITE request, indicating the conference URI in the Contact header.

5.3.2.5 Invitation of users to a conference

5.3.2.5.1 General

The conference focus can invite users to a conference by sending an INVITE request to the user, as described in subclause 5.3.2.5.3. This procedure will be triggered at the conference focus either by a REFER request received from authorized users, that request the conference focus to invite other users to the conference, as described in subclause 5.3.2.5.2, or by the initial INVITE request that creates the conference when it includes a" recipient-list" message body as described in subclause 5.3.1.5.4.

NOTE: Additionally, invitation of users to a conference can be triggered by other means.

Additionally, the conference focus can invite users to a conference by sending a REFER request to the user, as described in subclause 5.3.2.5.4. How these procedures are triggered is outside the scope of this specification.

5.3.2.5.2 Request from a user to invite another user to a conference using a REFER request

Upon receipt of an REFER request that includes:

a) a conference URI in the request URI; and

b) a Refer-To header including:

- a valid SIP URI or tel URL; and,

- the "method" parameter either set to "INVITE" or omitted;

NOTE: If the "method" URI parameter is omitted, the conference focus assumes that the method is INVITE.

the conference focus shall:

1) check if the conference URI is allocated. If the conference URI is not allocated, the conference focus shall reject the request in accordance with RFC 3261 [7]. The following actions in this subclause shall only be performed if the conference URI is allocated;

2) verify the identity of the user as described in subclause 5.7.1.4 of 3GPP TS 24.229 [5] and authorize the request as described in subclause 5.7.1.5 of 3GPP TS 24.229 [5]. The following actions in this subclause shall only be performed if the request can be authorized;

3) generate a final response to the REFER request in accordance with RFC 3515 [17];

4) invite the user indicated in the Refer-To header by performing the procedures as described in subclause 5.3.2.5.4;

5) if the received REFER request included a Referred-By header, include the Referred-By header in accordance with RFC 3892 [20] in the INVITE request that is sent for inviting the user to join the conference;

5a) if the received REFER request included a Replaces header, include the Replaces header in accordance with RFC 3891 [33] and 3GPP TS 24.229 [5] in the INVITE request that is sent for joining the conference; and

6) based on the progress of this invitation, send NOTIFY messages in accordance with the procedures of RFC 3515 [17] towards the user who sent the REFER request.

5.3.2.5.3 Request from a user to invite another user to a conference using an INVITE request for conference creation

Upon receipt of an INVITE request for conference creation (see subclause 5.3.2.3) after receiving a valid "recipient-list" as defined in RFC 5366 [34], the conference focus shall, in addition to the procedures described in subclause 5.3.2.3, perform following actions:

1) support the procedures of RFC 5360 [36] associated with such a URI list. The conference focus shall act as the relay and may act as a store and forward server as defined in RFC 5360 [36]; and

2) send an INVITE request to each of the SIP URIs contained in the URI list that is embedded in the message body of the INVITE request for conference creation, by following the procedures in subclause 5.3.2.5.4.

The invitation of the users whose SIP URIs are included in the URI list should be initiated by the conference focus in parallel, since the objective of using the URI-list method of inviting users to a conference is usually a fast conference set-up. However, in case the conference focus is not able to keep track of multiple parallel invitations associated to a single conference the conference focus may issue the invitations serially.

Sending of the multiple invitations should be initiated by the MRFC/AS as soon as a conference URI for the conference has been created, and should run in parallel to the procedure described in subclause 5.3.2.3 in order to speed up conference establishment. If establishment of a session to any of the invitees fails, the further actions depends on local policy whether the conference will continue with the accepted participants or release the whole conference.

If the conference focus is included in the signalling path between the conference creator and the invited user as a B2B UA, and

- if the URIs in the URI list contain a Session-ID header field, the focus shall verify if the Session ID information matches to a partial dialog between the focus and the conference creator; else

- if the URIs in the URI list contain Call-ID header field, From header field and To header field, the focus shall verify if this dialog ID information matches to a partial dialog between the focus and the conference creator.

In the case of a match the focus may use this information to send re-INVITE request in the partial dialogs between the focus and the invited users in order to connect the media of the invited users to the MRFP.

In the case of no match the focus shall discard Call-ID header field, From header field, To header field and Session-ID header field form the URIs in the URI list, if those header fields are included.

5.3.2.5.4 Inviting a user to a conference by sending an INVITE request

When generating an INVITE request in order to invite a user to a specific conference, the conference focus shall:

1) set the request URI of the INVITE request to the address of the user who is invited to the conference;

2) set the P-Asserted-Identity header of the INVITE request to the conference URI of the conference that the user shall be invited to;

3) set the Contact header of the INVITE request to the conference URI of the conference that the user shall be invited to, including the "isfocus" feature parameter;

4) if the INVITE request is generated due to a received REFER request from another conference participant and that received REFER request included a Referred-By header, include the Referred-By header in accordance with RFC 3892 [20] in the INVITE request;

4a) if the INVITE request is generated due to a received REFER request from another conference participant and the received REFER request included a Replaces header, include the Replaces header in accordance with RFC 3891 [33] and 3GPP TS 24.229 [5] in the INVITE request;

5) send the INVITE request towards the user who is invited to the conference.

NOTE 1: The conference focus will request the resources required for the new user from the conference mixer.

NOTE 2: Requests are generated in accordance with 3GPP TS 24.229 [5].

Afterwards the conference focus shall proceed the session establishment as described in 3GPP TS 24.229 [5].

5.3.2.5.5 Inviting a user to a conference by sending a REFER request

When generating a REFER request in order to invite a user to a specific conference, the conference focus shall:

1) set the request URI of the REFER request to the address of the user who is invited to the conference;

2) set the P-Asserted-Identity header of the REFER request to the conference URI of the conference that the user shall be invited to;

3) set the Refer-To header of the REFER request to the conference URI of the conference that the other user shall be invited to, and either including the "method" URI parameter set to "INVITE" or omitting the "method" URI parameter; and

NOTE 1: Other headers of the REFER request will be set in accordance with 3GPP TS 24.229 [5].

4) send the REFER request towards the user who is invited to the conference.

NOTE 2: Requests are generated in accordance with 3GPP TS 24.229 [5].

Afterwards the conference focus shall treat incoming NOTIFY requests that are related to the previously sent REFER request in accordance with RFC 3515 [17].

5.3.2.6 Leaving a conference

5.3.2.6.1 Conference participant leaving a conference

Upon receipt of a BYE message from a conference participant, the conference focus shall:

1) respond to the BYE request as described in 3GPP TS 24.229 [5] and RFC 3261 [7]; and

2) release the resources, related to the conference participant from the conference mixer.

5.3.2.6.2 Removing a conference participant from a conference

5.3.2.6.2.1 General

The conference focus can remove a conference participant from a conference by terminating the dialog with the conference participant. This is done by sending a BYE request to the participant, as described in subclause 5.3.2.6.2.3. The removal of a conference participant by the conference focus will be triggered:

1) by a REFER request received from authorized users, that request the conference focus to remove the conference participant from the conference, as described in subclause 5.3.2.6.2.2; or

2) by local administration procedures.

NOTE: Additionally, a conference participant may be removed from a conference by other means.

5.3.2.6.2.2 Request from a conference participant to remove another conference participant from a conference

Upon receipt of a REFER request that includes:

a) a conference URI in the request URI; and,

b) a Refer-To header including:

   1) a valid SIP URI; and

2) the "method" parameter set to "BYE".

The conference focus shall:

1) check if the conference URI is allocated. If the conference URI is not allocated, the conference focus shall reject the request in accordance with RFC 3261 [7]. The following actions in this subclause shall only be performed if the conference URI is allocated;

1A) if the SIP URI contains a user parameter that equals "phone" and if the SIP URI of the Refer-To header can be converted to a global tel URI as described in RFC 3261 [7], convert the SIP URI to the equivalent global tel URI. Verify that the tel URI belongs to user who is currently a participant of the referenced conference. If this verification fails, then reject the request in accordance with RFC 3261 [7] and RFC 3515 [17];

2) check if the SIP URI of the Refer-To header is identical to the conference URI or belongs to a user who is currently a participant of the referenced conference. If this verification fails, then reject the request in accordance with RFC 3261 [7] and RFC 3515 [17];

3) verify the identity of the user as described in subclause 5.7.1.4 of 3GPP TS 24.229 [5] and authorize the request as described in subclause 5.7.1.5 of 3GPP TS 24.229 [5]. The following actions in this subclause shall only be performed if the request can be authorized;

4) generate a final response to the REFER request in accordance with RFC 3515 [17];

5) if a single conference participant is indicated in the Refer-To header, remove this conference participant from the conference according to subclause 5.3.2.6.2.3. If the Refer-To header includes the conference URI, remove all conference participants from the conference by performing the procedures described in subclause 5.3.2.6.2.3 for each conference participant individually; and

6) based on the progress of this removal, send NOTIFY messages in accordance with the procedures of RFC 3515 [17] towards the conference participant who sent the REFER request.

5.3.2.6.2.3 Conference focus removes conference participant from a conference

When removing a conference participant from a conference, the conference focus shall:

1) generate a BYE request on the dialog that was established when the conference participant joined or created the conference, in accordance to the procedures described in 3GPP TS 24.229 [5] and RFC 3261 [7];

2) release the resources, related to the conference participant from the conference mixer.

5.3.2.7 Conference termination

A conference shall be terminated by the conference focus:

1) when the conference has been created by means of the procedure described in subclause 5.3.2.5.3 and session establishment to one or more of the invitees has failed; or

2) when the conference policy dictates it; or

3) when no dedicated rules for conference termination exist in the conference policy; and:

- either the conference was created with a conference factory URI and the conference creator has left the conference; or

- the last conference participant has left or has been removed from the conference.

NOTE: How the conference policy can be created or changed is out of the scope of this specification.

To terminate an existing conference, the conference focus shall:

1) remove all present conference participants from the conference by performing the procedures as described in subclause 5.3.2.6.2.3 for each participant individually; and

2) deallocate the conference URI.

5.3.3 Conference Notification Service

5.3.3.1 General

In addition to the procedures specified in subclause 5.3.3, the conference notification service shall support the procedures specified in 3GPP TS 24.229 [5] appropriate to the functional entity in which the conference notification service is implemented.

5.3.3.2 Subscription to conference event package

Upon receipt of a SUBSCRIBE request that includes a conference URI in the request URI and the "conference" tag in the Event header, the conference notification service shall:

1) check if the conference URI is allocated and reject the request in accordance with RFC 3261 [7] if it is not allocated. The following actions in this subclause shall only be performed if the conference URI is allocated;

2) verify the identity of the user as described in subclause 5.7.1.4 of 3GPP TS 24.229 [5] and authorize the request as described in subclause 5.7.1.5 of 3GPP TS 24.229 [5]. The following actions shall only be performed if the request can be authorized; and

3) establish the subscription to the conference state event information as described in RFC 3265 [10] and RFC 4575 [11].

5.3.3.3 Leaving a conference

When generating a NOTIFY request with conference state event information that is destined to a subscriber that has either left the conference or was removed from it, the conference notification service shall, include in the NOTIFY request a Subscription-State header with the value "terminated" in accordance with RFC 3265 [10].

5.3.3.4 Conference termination

The conference notification service shall terminate all subscriptions to the conference event package in accordance with RFC 4575 [11] when the conference is terminated, as described in subclause 5.3.2.7.

6 Protocol using SDP for conferencing

6.1 Introduction

Void

6.2 Functional entities

6.2.1 User Equipment (UE)

For the purpose of SIP based conferences, the UE shall implement the role of a conference participant as described in subclause 6.3.1.

6.2.2 Media Resource Function Controller (MRFC)

For the purpose of SIP based conferences, the MRFC shall support the procedures for media control of ad-hoc conferencing described in subclause 10.3 of 3GPP TS 24.229 [5].

6.2.3 Conferencing Application Server (Conferencing AS)

For the purpose of SIP-based conferences, the conferencing AS shall act as a conference focus, as described in subclause 6.3.2. The conferencing AS may implement the role of a conference participant as described in subclause 6.3.1.

The conferencing AS shall use the procedures for media control in subclause 10.2 of 3GPP TS 24.229 [5] to implement SIP based conferences.

6.2.4 Media Gateway Control Function (MGCF)

The MGCF implements the role of Conference participant (see subclause 6.3.1).

6.3 Role

6.3.1 Conference Participant

The conference participant shall support the procedures specified in 3GPP TS 24.229 [5] appropriate to the functional entity in which the conference participant is implemented.

If the conference participant uses BFCP as specified in clause 8, then the conference participant shall support the procedures specified in RFC 4583 [35].

6.3.2 Conference Focus

In addition to the procedures specified in subclause 6.3.2, the conference focus shall support the procedures specified in 3GPP TS 24.229 [5] appropriate to the functional entity in which the conference focus is implemented.

If the conference focus uses BFCP as specified in clause 8, then the conference focus shall support the procedures specified in RFC 4583 [35].

NOTE: RFC 4582 [28] recommends the use of Transport Layer Security (TLS) for the secure exchange of BFCP. Whether this is followed, and the mechanism for the exchange of the certificates in association with SDP are outside the scope of this version of this document.

When the conference focus receives any SIP request or response containing SDP, the conference focus shall examine the media parameters in the received SDP.

Provided that the INVITE request received by the conference focus contains an SDP offer including one or more "m=" media descriptions, the SDP answer shall:

- reflect the media capabilities and policies as available for the conference; and
- contain a request confirmation for the result of the resource reservation at the originating end point for every "m=" media line if preconditions were required by the originator.

During session establishment procedure for a conference, SIP messages shall only contain SDP payload if that is intended to modify the session description.

For "video" and "audio" media types that utilize the RTP/RTCP, the conference focus shall specify the proposed bandwidth for each media stream utilizing the "b=" media descriptor in the SDP. For other media streams the "b=" media descriptor may be included. The value or absence of the "b=" parameter will affect the assigned QoS which is defined in 3GPP TS 29.208 [15].

The conference focus shall include the DTMF media format at the end of the "m=" media descriptor in the SDP for audio media flows that support both audio codec and DTMF payloads in RTP packets as described in RFC 2833 [16].

Upon receipt of a SDP answer or sending a SDP answer that changes the resource requirements for the conference, the conference focus shall provide the corresponding changes of conference resources.

Upon receipt of a SDP offer during conference creation, that confirms that the conference participant has reserved the required resources, the conference focus shall through-connect the conference resources.

7 Void.

8 Protocol for floor control for conferencing

8.1 Introduction

Support of floor control is optional for participants and MRFP.

8.2 Functional entities

8.2.1 User Equipment (UE)

A UE may support the floor participant (see subclause 8.3.1) or floor chair role (see subclause 8.3.2). A floor chair may, but need not, be a floor participant.

8.2.2 Media Resource Function Processor (MRFP)

An MRFP may support the floor control server role (see subclause 8.3.3), the floor chair role (see subclause 8.3.2), or the floor participant role (see subclause 8.3.1).

8.3 Role

8.3.1 Floor participant

The floor participant shall support general client operations and floor participant operations as described in RFC 4582 [28].

BFCP messages shall be sent on any IP-CAN transport used for media in accordance with subclause 9.2.2 of 3GPP TS.24.229 [5].

8.3.2 Floor chair

The floor chair shall support client operations and floor chair operations as described in RFC 4582 [28].

BFCP messages shall be sent on any IP-CAN transport used for media in accordance with subclause 9.2.2 of 3GPP TS.24.229 [5].

8.3.3 Floor control server

The floor control server shall support floor control server operations as described in RFC 4582 [28].

NOTE: It is out of scope of this version of the document how the floor control server discovers the floor control policy of the conference, and how the floor control server manipulates the media policy of the conference due to changes in the status of any floor.

Annex A (informative): Example signalling flows of conferencing operation

A.1 Scope of signalling flows

This annex gives examples of signalling flows for conferencing within the IP Multimedia CN Subsystem (IMS) based on the Session Initiation Protocol (SIP), SIP Events and the Session Description Protocol (SDP).

These signalling flows provide detailed signalling flows, which expand on the overview information flows provided in 3GPP TS 23.228 [6].

These signalling flows are simplified in that they do not show the AS to MRFC interactions nor the AS and MRFC functional split.

A.2 Introduction

A.2.1 General

This annex breaks down the signalling flows for establishing sessions into a number of individual procedures, following the same principles as 3GPP TS 23.228 [3] subclause 5.4.9.

For the purposes of the present document, a further breakdown has been necessary, and therefore a number of signalling flows have been given an (a) or (b) suffix, so that the signalling flows for establishing sessions where configuration independence is applied may be distinguished from those where it is not, e.g.:

- (MO#1a) Mobile origination, roaming, without I-CSCF providing configuration independence.
- (MO#1b) Mobile origination, roaming, with I-CSCF in home network providing configuration independence.

A.2.2 Key required to interpret signalling flows

The key to interpret signalling flows specified in 3GPP TS 24.228 [4] subclause 4.1 applies with the additions specified below:

- #### represents the contents in the headers are not shown and does not impact the implementation of the flows.

As in 3GPP TS 24.228 [4], in order to differentiate between SIP methods and other protocol messages, the message name is preceded with the associated protocol for all non-SIP messages.

Each flow table contains descriptions for headers where the content of the header is new to that flow, as is already performed in 3GPP TS 24.228 [4].

However, 3GPP TS 24.228 [4] includes extensive descriptions for the contents of various headers following each of the tables representing the contents of the flows. Where the operation of the header is identical to that shown in 3GPP TS 24.228 [4], then such text is not reproduced in the present document.

Additional text may also be found on the contents of headers within 3GPP TS 24.228 [4] in addition to the material shown in the present document.

A.2.3 Overview of signalling flows related to PSI routeing

The flows in this annex reflect examples for some of the PSI specific routing scenarios. This subclause gives a list of the PSI scenarios and indicates which flows specifically cover them:

1) User originating a dialog towards a PSI.

a) PSI is hosted by the originating users home network.

   i) S-CSCF of originating user can directly route towards the AS hosting the PSI.

      This case is shown in subclauses A.3.2.1 and A.4.4.1.

   ii) PSI is statically pre-configured, i.e. S-CSCF of the originating user routes towards the S-CSCF assigned to the PSI, which afterwards routes towards the AS hosting the PSI.

      This case is not covered by the present document.

b) PSI is hosted by a network different from the originating users home network.

   i) PSI can be resolved directly by the S-CSCF located in the originating users home network.

      This case is shown in subclauses A.4.2.1.2 and A.5.2.1.

   ii) S-CSCF in originating users home network can only resolve an I-CSCF of the network that is hosting the PSI.

      - I-CSCF can directly route towards the AS hosting the PSI.

        This case is shown in subclauses A.3.2.2 and A.4.2.1.1.

      - PSI is statically pre-configured, i.e. I-CSCF routes first to S-CSCF in the network that hosts the PSI, the S-CSCF afterwards routes towards the AS hosting the PSI.

        This case is not covered by the present document.

2) Dialog originates from a PSI.

   a) AS routes directly to the I-CSCF of the terminating users home network.

      This case is shown in subclause A.4.3.1.3.

   b) AS routes first to a S-CSCF in the network hosting the PSI, which then routes to the I-CSCF of the terminating users home network.

      This case is shown in subclause A.4.3.1.4.

3) Dialog originating from a PSI and terminating at a different PSI.

   This case is not covered by the present document.

A.3 Flows demonstrating the creation of a conference

A.3.1 Introduction

Clause A.3 covers the flows that show how a user can create conferences at a MRFC/AS.

A.3.2 User automatically creating a conference with a conference factory URI

A.3.2.1 MRFC/AS is located in user's home network

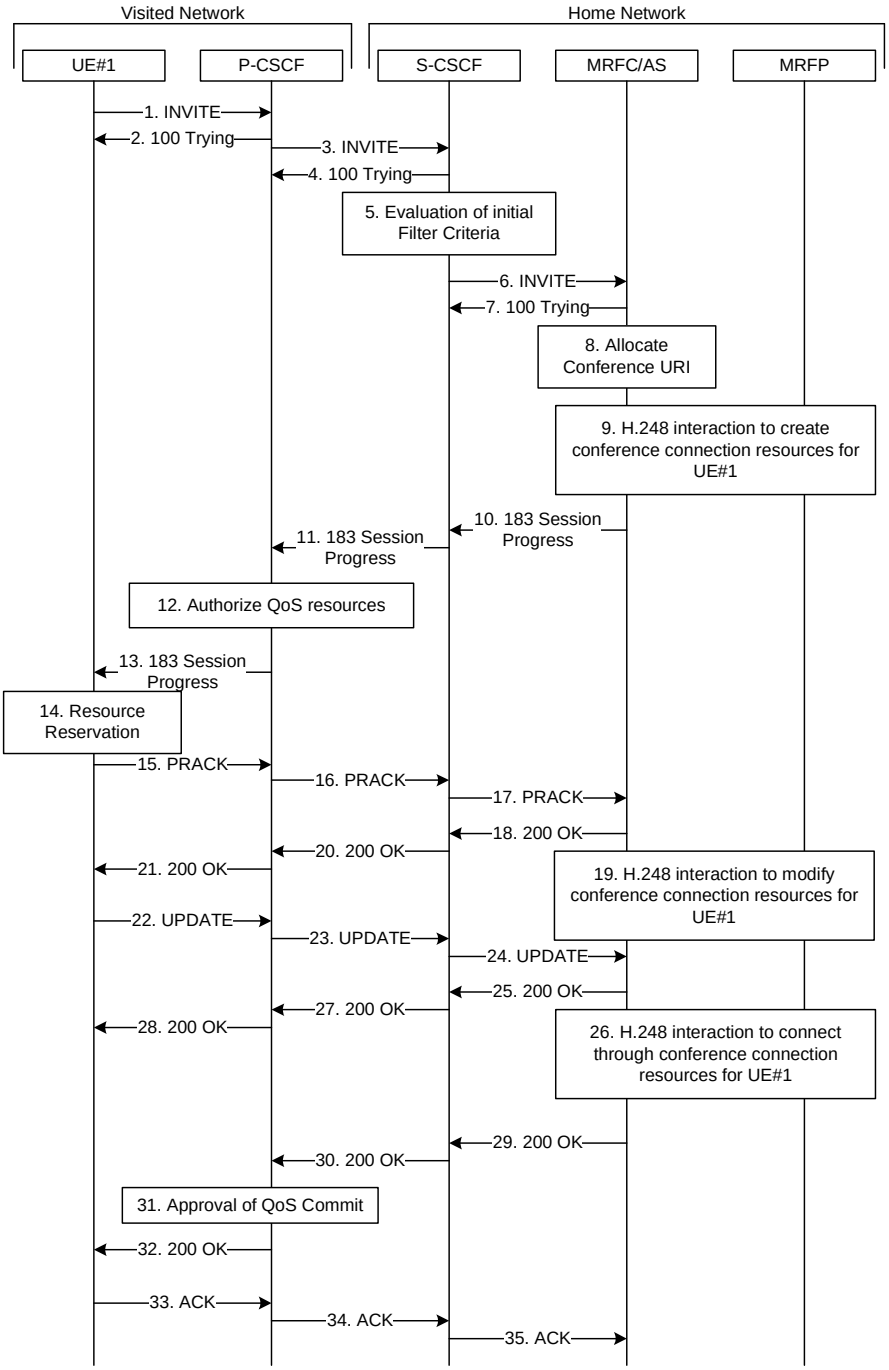

Figure A.3.2.1-1: User automatically creating a conference with a conference factory URI - MRFC/AS is located in user's home network

Figure A.3.2.1-1 shows an user creating a conference by using a conference-factory URI. The conference is created at a MRFC/AS of the users home network.

The details of the flows are as follows:

1. **INVITE request (UE to P-CSCF) - see example in table A.3.2.1-1**

   A UE wants to create a conference. For this purpose the UE is aware of a conference-factory URI that was obtained by means outside the present document (e.g. due to pre-configuration or via other protocols, such as http).

   The UE determines the complete set of codecs that it is capable of supporting for this conference. It builds a SDP Offer containing bandwidth requirements and characteristics of each, and assigns local port numbers for each possible media flow. Multiple media flows may be offered, and for each media flow (m= line in SDP), there may be multiple codec choices offered.

   For this example, it is assumed that UE#1 is willing to establish a multimedia session comprising a video stream and an audio stream. The video stream supports two codecs, either H.263 or MPEG-4 Visual. The audio stream supports the AMR codec.The UE sends the INVITE request to the P-CSCF.

   The UE indicates that it supports precondition and it indicates that it supports reliable provisional responses. However, it does not use the "Require' header for these capabilities.

   The UE does not have available the resources that are necessary to transport the media.

   For this example it is assumed, that signalling encryption was negotiated between UE and P-CSCF in the security mode set-up procedure during the last successful authentication. This option will only be shown in this example.

Table A.3.2.1-1: INVITE request (UE to P-CSCF)

```
INVITE sip:conference-factory1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory1@mrfc1.home1.net>
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Supported: precondition, 100rel, gruu, 199
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Contact: <sip:user1_public1@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
Accept: application/sdp, application/3gpp-ims+xml
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=video 3400 RTP/AVP 98 99
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99:MPVMP4V-ES
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

Request-URI: contains the conference factory URI.

2. **100 (Trying) response (P-CSCF to UE) - see example in table A.3.2.1-2**

The P-CSCF responds to the INVITE request (1) with a 100 (Trying) provisional response.

Table A.3.2.1-2: 100 (Trying) response (P-CSCF to UE)

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

3. **INVITE request (P-CSCF to S-CSCF) - see example in table A.3.2.1-3**

The P-CSCF forwards the INVITE request to the S-CSCF.

Table A.3.2.1-3: INVITE request (P-CSCF to S-CSCF)

```
INVITE sip:conference-factory1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:orig@scscf1.home1.net;lr>
Record-Route: <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (…)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

4. **100 (Trying) response (S-CSCF to P-CSCF) - see example in table A.3.2.1-4**

The S-CSCF responds to the INVITE request (3) with a 100 (Trying) provisional response.

Table A.3.2.1-4: 100 (Trying) response (S-CSCF to P-CSCF)

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

5. **Evaluation of initial filter criteria**

The S-CSCF validates the service profile of this subscriber and evaluates the initial filter criteria.

6. **INVITE request (S-CSCF to MRFC/AS) - see example in table A.3.2.1-6**

   The S-CSCF forwards the INVITE request to the MRFC/AS that is indicated in the host part of the Request URI. The S-CSCF does not re-write the Request URI.

Table A.3.2.1-6: INVITE request (S-CSCF to MRFC/AS)

```
INVITE sip:conference-factory1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+358-50-4821437>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

7. **100 (Trying) response (MRFC/AS to S-CSCF) - see example in table A.3.2.1-7 (related to table A.3.2.1-6)**

   The MRFC/AS responds to the INVITE request (6) with a 100 (Trying) provisional response.

Table A.3.2.1-7: 100 (Trying) response (MRFC/AS to S-CSCF)

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

8. **Allocate conference URI**

   The MRFC/AS allocates a conference URI, based on local information and information gained from the conference-factory URI, as well as information gained from other elements of the SIP signalling.

9. **H.248 interaction to create connection**

   The MRFC initiates a H.248 interaction to create an IMS connection point for UE#1 in MRFP and to determine media capabilities of the MRFP.

10. **183 (Session Progress) response (MRFC/AS to S-CSCF) - see example in table A.3.2.1-13 (related to table A.3.2.1-6)**

    The MRFC determines the complete set of codecs that it is capable of supporting for this conference. It determines the intersection with those appearing in the SDP in the INVITE request.

    The media stream capabilities of the destination are returned along the signalling path, in a 183 (Session Progress) provisional response (to 6).

Table A.3.2.1-10: 183 (Session Progress) response (MRFC/AS to S-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "Conference Server" <sip:mrfc1.home1.net>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net;
   term-ioi=home1.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy: none
From:
To: <sip:conference-factory1@mrfc1.home1.net>; tag=314159
Call-ID:
CSeq:
Require: precondition, 100rel
Contact: <sip:lmaa234269@mrfc1.home1.net>;isfocus
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY, PUBLISH
RSeq: 9021
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933623 2987933623 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::eee:fff:aaa:bbb
t=0 0
m=video 10001 RTP/AVP 98 99
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=inactive
a=conf:qos remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=audio 6544 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=inactive
a=conf:qos remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

Contact:	Contains the IP address or FQDN of the MRFC/AS and a temporary identifier of the conference being created in the user part. The URI for the allocated conference is not indicated yet. The "isfocus" feature parameter is included, as this temporary contact is still a conference URI.
P-Charging-Vector:	The MRFC/AS inserts this header and populates the icid parameters with a unique value and populates the term-ioi parameter with the identifier of its own network.
P-Charging-Function-Address:	The MRFC/AS stores the P-Charging-Function-Addresses header field to be passed to the S-CSCF.

11. **183 (Session Progress) response (S-CSCF to P-CSCF) - see example in table A.3.2.1-11**

The S-CSCF forwards the 183 (Session Progress) response to the P-CSCF.

Table A.3.2.1-11: 183 (Session Progress) response (S-CSCF to P-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

12. **Authorize QoS Resources**

The P-CSCF authorizes the resources necessary for this session. The approval of QoS commitment either happens at this stage or after the 200 (OK) response of INVITE request (39) based on operator local policy.

13 **183 (Session Progress) response (P-CSCF to UE) - see example in table A.3.2.1-13**

The P-CSCF forwards the 183 (Session Progress) response to the originating endpoint.

Table A.3.2.1-13: 183 (Session Progress) response (P-CSCF to UE)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

14. **Resource reservation**

The originating UE sets up the bearer in accordance with the media description received SDP.

15. **PRACK request (UE to P-CSCF) - see example in table A.3.2.1-15**

The PRACK request does not carry SDP as the final codec decision is already made as part of the initial offer/answer exchange.

Table A.3.2.1-15: PRACK request (UE to P-CSCF)

```
PRACK sip:lmaa234269@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr> From:
   <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory1@mrfc1.home1.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 128 PRACK
Require: precondition, sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
RAck: 9021 127 INVITE
Content-Length: 0
```

16. **PRACK request (P-CSCF to S-CSCF) - see example in table A.3.2.1-16**

The P-CSCF forwards the PRACK request to the S-CSCF.

Table A.3.2.1-16: PRACK request (P-CSCF to S-CSCF)

```
PRACK sip:lmaa234269@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Require: precondition
RAck:
Content-Length:
```

17. **PRACK request (S-CSCF to MRFC/AS) - see example in table A.3.2.1-17**

The S-CSCF forwards the PRACK request to the MRFC/AS.

Table A.3.2.1-17: PRACK request (S-CSCF to MRFC/AS)

```
PRACK sip:lmaa234269@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
P-Access-Network-Info:
From:
To:
Call-ID:
Cseq:
Require:
RAck:
Content-Length:
```

18. **200 (OK) response (MRFC/AS to S-CSCF) - see example in table A.3.2.1-18 (related to table A.3.2.1-17)**

The MRFC/AS acknowledges the PRACK request (17) with a 200 (OK) response.

Table A.3.2.1-18: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

19. **H.248 interaction to modify connection**

MRFC initiates a H.248 interaction to modify the connection established in step #9 and instructs MRFP to reserve the multimedia processing resources for UE#1 according to the preceding resource negotiation between the UE#1 and the MRFC.

20. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.3.2.1-20**

The S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.3.2.1-20: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length:
```

21. **200 (OK) response (P-CSCF to UE) - see example in table A.3.2.1-21**

The P-CSCF forwards the 200 (OK) response to the UE.

Table A.3.2.1-21: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length:
```

22. **UPDATE request (UE to P-CSCF) - see example in table A.3.2.1-22**

When the resource reservation is completed, the UE sends the UPDATE request to the MRFC/AS, via the signalling path established by the INVITE request.

Table A.3.2.1-22: UPDATE request (UE to P-CSCF)

```
UPDATE sip:lmaa234269@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory1@mrfc1.home1.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 129 UPDATE
Require: sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933617 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=video 0 RTP/AVP 98
b=AS:75
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telphone-event
```

23. **UPDATE request (P-CSCF to S-CSCF) - see example in table A.3.2.1-23**

The P-CSCF forwards the UPDATE request to the S-CSCF.

Table A.3.2.1-23: UPDATE request (P-CSCF to S-CSCF)

```
UPDATE sip:lmaa234269@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024";
   ggsn=[5555::4b4:3c3:2d2:1e1]; pdp-sig=no; gcid=723084371; auth-token=43876559; flow-id=3
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
m=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

24. **UPDATE request (S-CSCF to MRFC/AS) - see example in table A.3.2.1-24**

The S-CSCF forwards the UPDATE request to the MRFC/AS.

Table A.3.2.1-24: UPDATE request (S-CSCF to MRFC/AS)

```
UPDATE sip:lmaa234269@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
P-Access-Network-Info:
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
m=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

25. **200 (OK) response (MRFC/ASto S-CSCF) - see example in table A.3.2.1-25 (related to table A.3.2.1-24)**

The MRFC/AS acknowledges the UPDATE request (24) with a 200 (OK) response.

Table A.3.2.1-25: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933623 2987933625 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::eee:fff:aaa:bbb
t=0 0
m=video 0 RTP/AVP 98
b=AS:75
a=curr:qos local sendrecv
a=curr:qos remote sendrecv
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 6544 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote sendrecv
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

The SDP indicates that the resource reservation was successful both in the local and the remote segment.

26. **H.248 interaction to modify connection**

MRFC initiates a H.248 interaction to connect through the multimedia processing resources for UE#1 in MRFP.

27. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.3.2.1-27**

The S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.3.2.1-27: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

28. **200 (OK) response (P-CSCF to UE) - see example in table A.3.2.1-28**

The P-CSCF forwards the 200 (OK) response to the UE.

Table A.3.2.1-28: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

29. **200 (OK) response (MRFC/AS to S-CSCF) - see example in table A.3.2.1-29 (related to table A.3.2.1-6)**

After the success modification of the session (26), the MRFC/AS sends a 200 (OK) response final response to the INVITE request (6) to the S-CSCF.

Table A.3.2.1-29: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
From:
To:
Call-ID:
CSeq: 127 INVITE
Contact: <sip:conference1@mrfc1.home1.net>;isfocus
Allow-Events: conference, pending-additions
Content-Length:0
```

Contact: Contains the conference URI for the conference allocated at the MRFC/AS and the "isfocus" feature parameter.

Allow-Events: The MRFC/AS indicates support for the "conference" and "pending-additions" event packages.

30. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.3.2.1-30**

The S-CSCF sends a 200 (OK) response final response along the signalling path back to the P-CSCF.

Table A.3.2.1-30: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
From:
To:
Call-ID:
CSeq:
Contact:
Allow-Events:
Content-Length:
```

31. **Approval of QoS commit**

The P-CSCF approves the commitment of the QoS resources if it was not approved already in step (12).

32. **200 (OK) response (P-CSCF to UE) - see example in table A.3.2.1-32**

The P-CSCF forwards the 200 (OK) response final response to the session originator. The UE can start the media flow(s) for this session.

Table A.3.2.1-32: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
From:
To:
Call-ID:
CSeq:
Contact:
Allow-Events:
Content-Length:
```

33. **ACK request (UE to P-CSCF) - see example in table A.3.2.1-33**

The UE starts the media flow for this session, and responds to the 200(OK) response (32) with an ACK request sent to the P-CSCF.

Table A.3.2.1-33: ACK request (UE to P-CSCF)

```
ACK sip:conference1@mrfc1.home1.net:2342 SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>From:
   <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory1@mrfc1.home1.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 ACK
Content-Length: 0
```

34. **ACK request (P-CSCF to S-CSCF) - see example in table A.3.2.1-34**

The P-CSCF forwards the ACK request to the S-CSCF.

Table A.3.2.1-34: ACK request (P-CSCF to S-CSCF)

```
ACK sip:conference1@mrfc1.home1.net:2342 SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:
```

35. **ACK request (S-CSCF to MRFC/AS) - see example in table A.3.2.1-35**

The S-CSCF forwards the ACK request to the MRFC/AS.

Table A.3.2.1-35: ACK request (S-CSCF to MRFC/AS)

```
ACK sip:conference1@mrfc1.home1.net:2342 SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:
```

A.3.2.2 MRFC/AS is not located in user's home network

Figure A.3.2.2-1 shows an user creating a conference by using a conference-factory URI. The conference is created at a MRFC/AS located in a different network than user's S-CSCF.

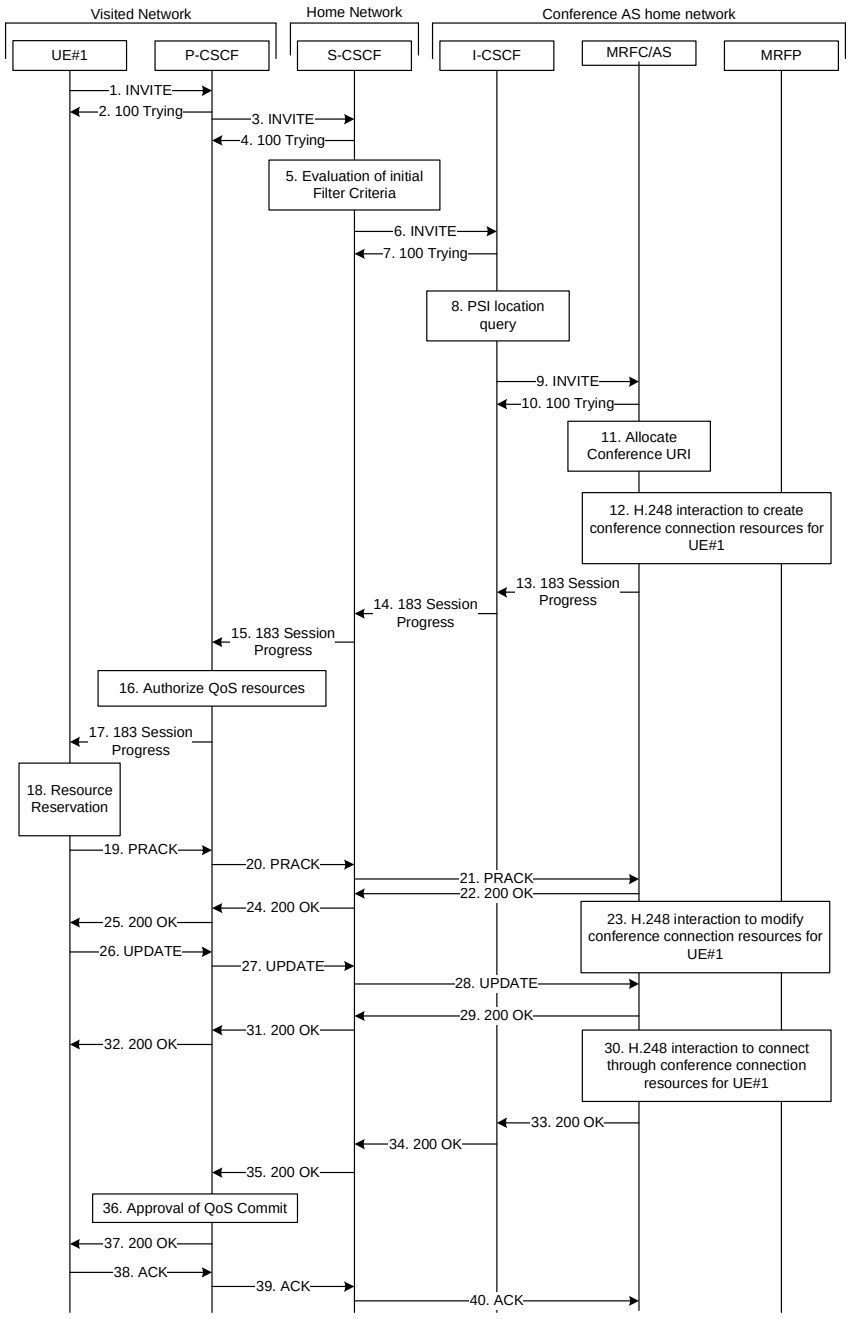

Figure A.3.2.2-1: User automatically creating a conference with a conference factory URI - MRFC/AS is not located in user's home network

The details of the flows are as follows:

1. **INVITE request (UE to P-CSCF) - see example in table A.3.2.2-1**

   A UE wants to create a conference to a MRFC/AS in other network. For this purpose the UE is aware of a conference-factory URI that was obtained by means outside the present document (e.g. due to pre-configuration or via other protocols, such as http)

   The UE determines the complete set of codecs that it is capable of supporting for this conference. It builds a SDP Offer containing bandwidth requirements and characteristics of each, and assigns local port numbers for each possible media flow. Multiple media flows may be offered, and for each media flow (m= line in SDP), there may be multiple codec choices offered.

   For this example, it is assumed that the UE is willing to establish a multimedia session comprising a video stream and an audio stream. The video stream supports two codecs, either H.263 or MPEG-4 Visual. The audio stream supports the AMR codec.The UE sends the INVITE request to the P-CSCF.

The UE indicates that it supports precondition and it indicates that it supports reliable provisional responses. However, it does not use the "Require" header for these capabilities.

The UE does not have available the resources that are necessary to transport the media.

For this example it is assumed, that signalling encryption was negotiated between UE and P-CSCF in the security mode set-up procedure during the last successful authentication. This option will only be shown in this example.

Table A.3.2.2-1: INVITE request (UE to P-CSCF)

```
INVITE sip:conference-factory@home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory@home2.net>
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Supported: precondition, 100rel, gruu, 199
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Contact: <sip: user1_public1@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
Accept:application/sdp, application/3gpp-ims+xml
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=video 3400 RTP/AVP 98 99
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99:MPVMP4V-ES
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

Request-URI: contains the conference factory URI.

2. **100 (Trying) response (P-CSCF to UE) - see example in table A.3.2.2-2**

The P-CSCF responds to the INVITE request (1) with a 100 (Trying) response provisional response.

Table A.3.2.2-2: 100 (Trying) response (P-CSCF to UE)

```
SIP/2.0 100 (Trying) response
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

3. **INVITE request (P-CSCF to S-CSCF) - see example in table A.3.2.2-3**

The P-CSCF forwards the INVITE request to the S-CSCF.

Table A.3.2.2-3: INVITE request (P-CSCF to S-CSCF)

```
INVITE sip:conference-factory@home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:orig@scscf1.home1.net;lr>
Record-Route: <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (…)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

4. **100 (Trying) response (S-CSCF to P-CSCF) - see example in table A.3.2.2-4**

   The S-CSCF responds to the INVITE request (3) with a 100 (Trying) response provisional response.

Table A.3.2.2-4: 100 (Trying) response (S-CSCF to P-CSCF)

```
SIP/2.0 100 (Trying) response
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

5. **Evaluation of initial filter criteria**

   The S-CSCF validates the service profile of this subscriber and evaluates the initial filter criteria.

6. **INVITE request (S-CSCF to I-CSCF) - see example in table A.3.2.2-6**

   S-CSCF determines the network where the INVITE request should be forwarded. The S-CSCF resolves the I-CSCF as the next hop for this request.

Table A.3.2.2-6: INVITE request (S-CSCF to I-CSCF)

```
INVITE sip:conference-factory@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+358-50-4821437>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

7. **100 (Trying) response (I-CSCF to S-CSCF) - see example in table A.3.2.2-7**

The I-CSCF responds to the INVITE request (6) with a 100 (Trying) response provisional response.

Table A.3.2.2-7: 100 (Trying) response (I-CSCF to S-CSCF)

```
SIP/2.0 100 (Trying) response
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

8. **Public service identity (PSI) location query**

The I-CSCF resolves the conference-factory URI. In this example the I-CSCF queries HSS to resolve the MRFC/AS PSI to be contacted. The HSS responds with the address of the MRFC/AS.

For detailed message flows see 3GPP TS 29.228 [12] .

Table A.3.2.2-8a provides the parameters in the SIP INVITE request, which are sent to the HSS.

Table A.3.2.2-8a Cx: User location query procedure (I-CSCF to HSS)

Message source and destination	Cx: Information element name	Information source in SIP INVITE	Description
I-CSCF to HSS	Public Service Identity (PSI)	Request-URI:	This information element indicates the public user identity

Table A.3.2.2-8b provides the parameters sent from the HSS that need to be mapped to SIP INVITE and sent to MRFC/AS.

Table A.3.2.2-8b Cx: User location query procedure (HSS to I-CSCF)

Message source and destination	Cx: Information element name	Mapping to SIP header in SIP INVITE	Description
HSS to I-CSCF	MRFC/AS address	IP packet destination address	This information element indicates the MRFC/AS address which serves the PSI.

9. **INVITE request (I-CSCF to MRFC/AS) - see example in table A.3.2.2-9**

I-CSCF forwards the INVITE request to the MRFC/AS. The I-CSCF does not add itself to the Record-Route header since it does not need to stay on the signalling path for subsequent requests.

Table A.3.2.2-9: INVITE request (I-CSCF to MRFC/AS)

```
INVITE sip:conference-factory@home2.net SIP/2.0
Via: SIP/2.0/UDP icscf1.home2.net;branch=z9hG4bK32f432.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 67
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

10. **100 (Trying) response (MRFC/AS to I-CSCF) - see example in table A.3.2.2-10 (related to table A.3.2.2-9)**

The MRFC/AS responds to the INVITE request (6) with a 100 (Trying) response provisional response.

Table A.3.2.2-10: 100 (Trying) response (MRFC/AS to I-CSCF)

```
SIP/2.0 100 (Trying) response
Via: SIP/2.0/UDP icscf1.home2.net;branch=z9hG4bK32f432.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

11. **Allocate conference URI**

MRFC/AS allocates a conference URI, based on local information and information gained from the conference-factory URI, as well as information gained from other elements of the SIP signalling.

12. **H.248 interaction to create connection**

MRFC initiates a H.248 interaction to create an connection point for UE#1 in MRFP and to determine media capabilities of MRFP.

13. **183 (Session Progress) response (MRFC/AS to I-CSCF) - see example in table A.3.2.2-13 (related to table A.3.2.2-9)**

The MRFC determines the complete set of codecs that it is capable of supporting for this conference. It determines the intersection with those appearing in the SDP in the INVITE request.

The media stream capabilities of the destination are returned along the signalling path, in a 183 (Session Progress) provisional response (to 8).

Table A.3.2.2-13: 183 (Session Progress) response (MRFC/AS to I-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP icscf1.home2.net;branch=z9hG4bK32f432.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "Conference Server" <sip:mrfc1.home2.net>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net;
   term-ioi=home2.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy: none
From:
To: <sip:conference-factory1@home2.net>; tag=314159
Call-ID:
CSeq:
Require: precondition, 100rel
Contact: <sip:conference1@mrfc1.home2.net>;isfocus
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY, PUBLISH
RSeq: 9021
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933623 2987933623 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::eee:fff:aaa:bbb
t=0 0
m=video 10001 RTP/AVP 98 99
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=inactive
a=conf:qos remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=audio 6544 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=inactive
a=conf:qos remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

Contact: Contains the conference URI for the conference allocated at the MRFC/AS and the "isfocus" feature parameter.

P-Charging-Vector: The MRFC/AS inserts the originating IOI parameter received and populates the terminating IOI parameter with its own network.

P-Charging-Function-Addresses: The MRFC/AS inserts the P-Charging-Function-Addresses header field to be passed to the I-CSCF.

14. **183 (Session Progress) response (I-CSCF to S-CSCF) - see example in table A.3.2.2-14**

The I-CSCF forwards the 183 (Session Progress) response to the P-CSCF.

Table A.3.2.2-14: 183 (Session Progress) response (I-CSCF to S-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net;
   term-ioi=home2.net
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

15. **183 (Session Progress) response (S-CSCF to P-CSCF) - see example in table A.3.2.2-15**

The S-CSCF forwards the 183 (Session Progress) response to the P-CSCF.

Table A.3.2.2-15: 183 (Session Progress) response (S-CSCF to P-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024";
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

16. **Authorize QoS Resources**

The P-CSCF authorizes the resources necessary for this session. The approval of QoS commitment either happens at this stage or after 200 (OK) response of INVITE request (34) based on operator local policy.

17. **183 (Session Progress) response (P-CSCF to UE) - see example in table A.3.2.2-17**

The P-CSCF forwards the 183 (Session Progress) response to the originating endpoint.

Table A.3.2.2-17: 183 (Session Progress) response (P-CSCF to UE)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

18. **Resource reservation**

The originating UE sets up the bearer in accordance with the media description received SDP.

19. **PRACK request (UE to P-CSCF) - see example in table A.3.2.2-19**

The PRACK request does not carry SDP as the final codec decision is already made as part of the initial offer/answer exchange.

Table A.3.2.2-19: PRACK request (UE to P-CSCF)

```
PRACK sip:conference1@mrfc1.home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 128 PRACK
Require: precondition, sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
RAck: 9021 127 INVITE
Content-Length: 0
```

20. **PRACK request (P-CSCF to S-CSCF) - see example in table A.3.2.2-20**

The P-CSCF forwards the PRACK request to the S-CSCF.

Table A.3.2.2-20: PRACK request (P-CSCF to S-CSCF)

```
PRACK sip:conference1@mrfc1.home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Require: precondition
RAck:
Content-Length:
```

21. **PRACK request (S-CSCF to MRFC/AS) - see example in table A.3.2.2-21**

The S-CSCF resolves the Request-URI and forwards the PRACK request directly to the MRFC/AS.

Table A.3.2.2-21: PRACK request (S-CSCF to MRFC/AS)

```
PRACK sip:conference1@mrfc1.home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Require:
RAck:
Content-Length:
```

22. **200 (OK) response (MRFC/AS to S-CSCF) - see example in table A.3.2.2-22 (related to table A.3.2.2-21)**

The MRFC/AS acknowledges the PRACK request (20) with a 200 (OK) response.

Table A.3.2.2-22: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

23. **H.248 interaction to modify connection**

MRFC initiates a H.248 interaction to modify the connection established in step #11 and instructs MRFP to reserve the multimedia processing resources for UE#1 according to the preceding resource negotiation between the UE#1 and the MRFC.

24. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.3.2.2-24**

The S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.3.2.2-24: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length:
```

25. **200 (OK) response (P-CSCF to UE) - see example in table A.3.2.2-25**

The P-CSCF forwards the 200 (OK) response to the UE.

Table A.3.2.2-25: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length:
```

26. **UPDATE request (UE to P-CSCF) - see example in table A.3.2.2-26**

When the resource reservation is completed, the UE sends the UPDATE request to the MRFC/AS, via the signalling path established by the INVITE request.

Table A.3.2.2-26: UPDATE request (UE to P-CSCF)

```
UPDATE sip:conference1@mrfc1.home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 129 UPDATE
Require: sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933617 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=video 0 RTP/AVP 98
b=AS:75
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telphone-event
```

27. **UPDATE request (P-CSCF to S-CSCF) - see example in table A.3.2.2-27**

The P-CSCF forwards the UPDATE request to the S-CSCF.

Table A.3.2.2-27: UPDATE request (P-CSCF to S-CSCF)

```
UPDATE sip:conferece1@mrfc1.home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024";
   ggsn=[5555::4b4:3c3:2d2:1e1]; pdp-sig=no; gcid=723084371; auth-token=43876559; flow-id=3
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
m=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

28. **UPDATE request (S-CSCF to MRFC/AS) - see example in table A.3.2.2-28**

The S-CSCF forwards the UPDATE request to the MRFC/AS.

Table A.3.2.2-28: UPDATE request (S-CSCF to MRFC/AS)

```
UPDATE sip:conference1@mrfc1.home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
m=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

29. **200 (OK) response (MRFC/ASto S-CSCF) - see example in table A.3.2.2-29 (related to table A.3.2.2-28)**

The MRFC/AS acknowledges the UPDATE request (27) with a 200 (OK) response.

Table A.3.2.2-29: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933623 2987933625 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::eee:fff:aaa:bbb
t=0 0
m=video 0 RTP/AVP 98
b=AS:75
a=curr:qos local sendrecv
a=curr:qos remote sendrecv
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 6544 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote sendrecv
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

The SDP indicates that the resource reservation was successful both in the local and the remote segment.

30. **H.248 interaction to modify connection**

MRFC initiates a H.248 interaction to connect through the multimedia processing resources for UE#1 in MRFP.

31. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.3.2.2-31**

The S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.3.2.2-31: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 (OK)
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

32. **200 (OK) response (P-CSCF to UE) - see example in table A.3.2.2-32**

The P-CSCF forwards the 200 (OK) response to the UE.

Table A.3.2.2-32: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

33. **200 (OK) response (MRFC/AS to I-CSCF) - see example in table A.3.2.2-33 (related to table A.3.2.2-9)**

After the success modification of the session (29), the MRFC/AS sends a 200 (OK) response final response to the INVITE request (8) to the I-CSCF.

Table A.3.2.2-33: 200 (OK) response (MRFC/AS to I-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP icscf1.home2.net;branch=z9hG4bK32f432.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
From:
To:
Call-ID:
CSeq: 127 INVITE
Contact: <sip:conference1@mrfc1.home2.net>;isfocus
Allow-Events: conference, pending-additions
Content-Length:0
```

Contact: Contains the conference URI for the conference allocated at the MRFC/AS and the "isfocus" feature parameter.

Allow-Events: The MRFC/AS indicates support for the "conference" and "pending-additions" event packages.

34. **200 (OK) response (I-CSCF to S-CSCF) - see example in table A.3.2.2-34**

The I-CSCF forwards the 200(OK) response to the S-CSCF

Table A.3.2.2-34: 200 (OK) response (I-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
From:
To:
Call-ID:
CSeq:
Contact:
Allow-Events:
Content-Length:0
```

35. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.3.2.2-35**

The S-CSCF sends a 200 (OK) response final response along the signalling path back to the P-CSCF.

Table A.3.2.2-35: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
From:
To:
Call-ID:
CSeq:
Contact:
Allow-Events:
Content-Length:
```

36. **Approval of QoS commit**

The P-CSCF approves the commitment of the QoS resources if it was not approved already in step (12).

37. **200 (OK) response (P-CSCF to UE) - see example in table A.3.2.2-37**

The P-CSCF forwards the 200 (OK) response final response to the session originator. The UE can start the media flow(s) for this session.

Table A.3.2.2-37: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
From:
To:
Call-ID:
CSeq:
Contact:
Allow-Events:
Content-Length:
```

38. **ACK request (UE to P-CSCF) - see example in table A.3.2.2-38**

The UE starts the media flow for this session, and responds to the 200 (OK) response (32) with an ACK request sent to the P-CSCF.

Table A.3.2.2-38: ACK request (UE to P-CSCF)

```
ACK sip:conference1@mrfc1.home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 ACK
Content-Length: 0
```

39. **ACK request (P-CSCF to S-CSCF) - see example in table A.3.2.2-39**

The P-CSCF forwards the ACK request to the S-CSCF.

Table A.3.2.2-39: ACK request (P-CSCF to S-CSCF)

```
ACK sip:conference1@mrfc1.home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:
```

40. **ACK request (S-CSCF to MRFC/AS) - see example in table A.3.2.2-40**

The S-CSCF forwards the ACK request to the MRFC/AS.

Table A.3.2.2-40: ACK request (S-CSCF to MRFC/AS)

```
ACK sip:conference1@mrfc1.home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:
```

A.3.3 User automatically creating a conference with a conference URI

The call flows for a user automatically creating a conference with a conference URI look identical to the call flows for conference creation with a conference-factory URI (see subclause A.3.2), besides the URIs carried in the Request URI and Contact header fields.

A.3.4 User creating a conference by manually dialling

The call flows for a user creating a conference by manually dialling into the IMS look identical to the call flows for conference creation with a conference-factory URI (see subclause A.3.2), besides the URIs carried in the Request URI and Contact header fields.

A.3.5 User creating a conference from two existing connections (Three-way session), users in different networks

Subclause 5.3.1.3.3 of the present document shows that the creation of a Three-way session is a local issue at the UE which results in a combination of other procedures (conference creation, conference participant invitation to conference, session release).

A.3.6 User automatically creating a conference with a conference factory URI and inviting some users to the newly-created conference

This flow shows how a user can create a conference using a conferece factory URI and simultaneously invite some users to the newly created conference, all using a single INVITE request.

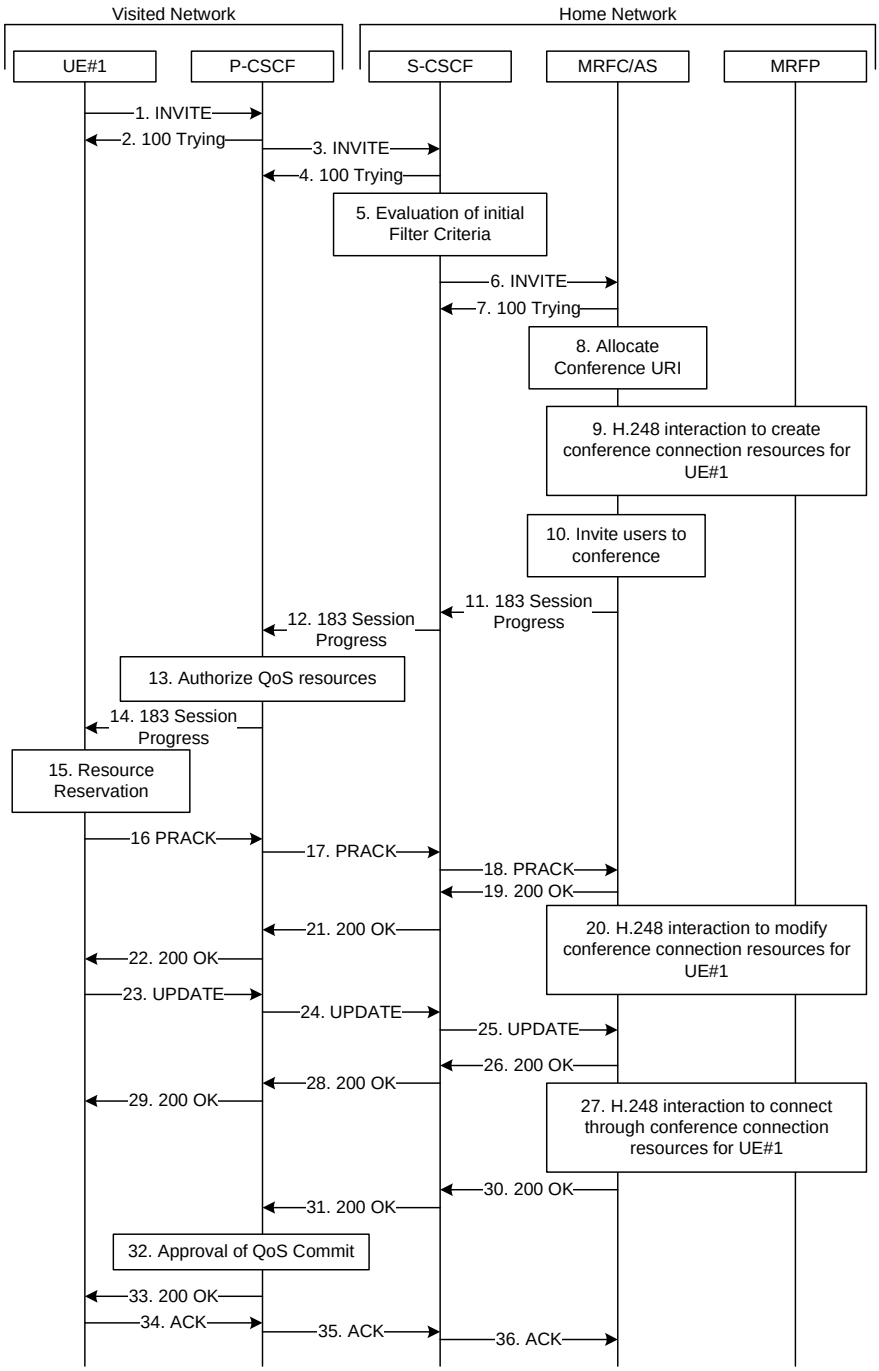

Figure A.3.6-1: User automatically creating a conference with a conference factory URI - MRFC/AS is located in user's home network

Figure A.3.6-1 shows an user creating a conference by using a conference-factory URI and simultaneouslt inviting some users to that conference. The conference is created at a MRFC/AS of the users home network.

The details of the flows are as follows:

1. **INVITE request (UE to P-CSCF) - see example in table A.3.6-1**

   A UE wants to create a conference. For this purpose the UE is aware of a conference-factory URI that was obtained by means outside the present document (e.g. due to pre-configuration or via other protocols, such as http).

   The UE wants also to invite some users to this conference in an expedite manner, avoiding the cumbersome manual invitation to each of these users. Thus it builds a URI list including the SIP URIs of the users that are to be invited and includes it in the message body of the INVITE request for conference creation.

That the invited users have previously given consent to the inviting user to invite them.

The UE determines the complete set of codecs that it is capable of supporting for this conference. It builds a SDP Offer containing bandwidth requirements and characteristics of each, and assigns local port numbers for each possible media flow. Multiple media flows can be offered, and for each media flow (m= line in SDP), there can be multiple codec choices offered.

For this example, it is assumed that the UE is willing to establish a multimedia session comprising an audio stream only. The audio stream supports the AMR codec. The UE sends the INVITE request to the P-CSCF.

The UE indicates that it supports precondition and it indicates that it supports reliable provisional responses. However, it does not use the "Require' header for these capabilities.

The UE does not have available the resources that are necessary to transport the media.

For this example it is assumed, that signalling encryption was negotiated between UE and P-CSCF in the security mode set-up procedure during the last successful authentication. This option will only be shown in this example.

Table A.3.6-1: INVITE request (UE to P-CSCF)

```
INVITE sip:conference-factory1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory1@mrfc1.home1.net>
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 INVITE
Require: sec-agree, recipient-list-invite
Proxy-Require: sec-agree
Supported: precondition, 100rel, gruu, 199
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Contact: <sip:user1_public1@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
Accept:application/sdp, application/3gpp-ims+xml
Content-Type: multipart/mixed;boundary="boundary1"
Content-Length: (…)

--boundary1
Content-Type: application/sdp

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event

--boundary1
Content-Type: application/resource-lists+xml
Content-Disposition: recipient-list

<?xml version="1.0" encoding="UTF-8"?>
<resource-lists xmlns="urn:ietf:params:xml:ns:resource-lists"
          xmlns:cp="urn:ietf:params:xml:ns:copycontrol">
  <list>
    <entry uri="sip:user2_public1@home1.net" cp:copyControl="to" />
    <entry uri="sip:user3_public1@home1.net" cp:copyControl="to"
                                        cp:anonymize="true"/>
    <entry uri="sip:user1_public1@foreign.com" cp:copyControl="to"
                                       cp:anonymize="true"/>
  </list>
</resource-lists>
--boundary1--
```

Request-URI: contains the conference factory URI.

Content-Type: contains the specification of the MIME content with the string used as part separator

2. **100 (Trying) response (P-CSCF to UE) - see example in table A.3.6-2**

The P-CSCF responds to the INVITE request (1) with a 100 (Trying) provisional response.

Table A.3.6-2: 100 (Trying) response (P-CSCF to UE)

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

3. **INVITE request (P-CSCF to S-CSCF) - see example in table A.3.6-3**

The P-CSCF forwards the INVITE request to the S-CSCF.

Table A.3.6-3: INVITE request (P-CSCF to S-CSCF)

```
INVITE sip:conference-factory1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:orig@scscf1.home1.net;lr>
Record-Route: <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
Privacy:
From:
To:
Call-ID:
Cseq:
Require: recipient-list-invite
Supported:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (…)

--boundary1
Content-Type:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=

--boundary1
Content-Type:
Content-Disposition:

<?xml …?>
<resource-lists>
  …
</resource-lists>
--boundary1
```

4. **100 (Trying) response (S-CSCF to P-CSCF) - see example in table A.3.6-4**

The S-CSCF responds to the INVITE request (3) with a 100 (Trying) provisional response.

Table A.3.6-4: 100 (Trying) response (S-CSCF to P-CSCF)

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

5. **Evaluation of initial filter criteria**

The S-CSCF validates the service profile of this subscriber and evaluates the initial filter criteria.

6. **INVITE request (S-CSCF to MRFC/AS) - see example in table A.3.6-6**

The S-CSCF forwards the INVITE request to the MRFC/AS that is indicated in the host part of the Request URI. The S-CSCF does not re-write the Request URI.

Table A.3.6-6: INVITE request (S-CSCF to MRFC/AS)

```
INVITE sip:conference-factory1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+358-50-4821437>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-
   ioi=typ3home1.net;orig-ioi=homei.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
Cseq:
Require:
Supported:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (...)

--boundary1
Content-Type:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=

--boundary1
Content-Type:
Content-Disposition:

<?xml …?>
<resource-lists>
  …
</resource-lists>
--boundary1
```

7. **100 (Trying) response (MRFC/AS to S-CSCF) - see example in table A.3.6-7 (related to table A.3.6-6)**

The MRFC/AS responds to the INVITE request (6) with a 100 (Trying) provisional response.

Table A.3.6-7: 100 (Trying) response (MRFC/AS to S-CSCF)

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

8. **Allocate conference URI**

   The MRFC/AS allocates a conference URI, based on local information and information gained from the conference-factory URI, as well as information gained from other elements of the SIP signalling.

9. **H.248 interaction to create connection**

   The MRFC initiates a H.248 interaction to create an IMS connection point for UE#1 in MRFP and to determine media capabilities of the MRFP.

10. **Invite users to conference**

    Once the conference URI is allocated the MRFC/AS checks that the the users identified by the SIP URIs in the body of the INVITE request from UE#1 have consented to be invited by UE#1. Provided they have previously consented, the users identified by the SIP URIs in the body of the INVITE request from UE#1 are invited to join the conference. To do this the MRFC/AS follows the procedure shown in A.4.3.1.3 setting the Request-URI to the users: sip:user2_public1@home1.net, sip:user3_public1@home1.net and sip:user1_public1@foreign.net.

    Notice that the three invitations would be sent simultaneously if the MRFC/AS does support it (see section 5.3.2.5.3). Notice also that it is not necessary that the MRFC/AS waits for the completion of the invitation procedures before continuing with step 11, i.e. the three invitations and the procedure being described in the present flow can run in parallel.

11. **183 (Session Progress) response (MRFC/AS to S-CSCF) - see example in table A.3.6-13 (related to table A.3.6-6)**

    The MRFC determines the complete set of codecs that it is capable of supporting for this conference. It determines the intersection with those appearing in the SDP in the INVITE request.

    The media stream capabilities of the destination are returned along the signalling path, in a 183 (Session Progress) provisional response (to 6).

Table A.3.6-10: 183 (Session Progress) response (MRFC/AS to S-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "Conference Server" <sip:mrfc1.home1.net>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net;
   orig-ioi=type3home1.net; term-ioi=home1.net; term-ioi=type3as1.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy: none
From:
To: <sip:conference-factory1@mrfc1.home1.net>; tag=314159
Call-ID:
CSeq:
Require: precondition, 100rel
Contact: <sip:lmaa234269@mrfc1.home1.net>;isfocus
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY, PUBLISH
RSeq: 9021
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933623 2987933623 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::eee:fff:aaa:bbb
t=0 0
m=audio 6544 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=inactive
a=conf:qos remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

Contact:	Contains the IP address or FQDN of the MRFC/AS and a temporary identifier of the conference being created in the user part. The URI for the allocated conference is not indicated yet. The "isfocus" feature parameter is included, as this temporary contact is still a conference URI.
P-Charging-Vector:	The MRFC/AS inserts this header and populates the icid parameters with a unique value and populates the term-ioi parameter with the identifier of its own network.
P-Charging-Function-Address:	The MRFC/AS stores the P-Charging-Function-Addresses header field to be passed to the S-CSCF.

11. **183 (Session Progress) response (S-CSCF to P-CSCF) - see example in table A.3.6-11**

The S-CSCF forwards the 183 (Session Progress) response to the P-CSCF.

Table A.3.6-11: 183 (Session Progress) response (S-CSCF to P-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

12. **Authorize QoS Resources**

    The P-CSCF authorizes the resources necessary for this session. The approval of QoS commitment either happens at this stage or after the 200 (OK) response of INVITE request (39) based on operator local policy.

13 **183 (Session Progress) response (P-CSCF to UE) - see example in table A.3.6-13**

    The P-CSCF forwards the 183 (Session Progress) response to the originating endpoint.

Table A.3.6-13: 183 (Session Progress) response (P-CSCF to UE)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
a=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

14. **Resource reservation**

The originating UE sets up the bearer in accordance with the media description received SDP.

15. **PRACK request (UE to P-CSCF) - see example in table A.3.6-15**

The PRACK request does not carry SDP as the final codec decision is already made as part of the initial offer/answer exchange.

Table A.3.6-15: PRACK request (UE to P-CSCF)

```
PRACK sip:lmaa234269@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr> From:
   <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory1@mrfc1.home1.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 128 PRACK
Require: precondition, sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
RAck: 9021 127 INVITE
Content-Length: 0
```

16. **PRACK request (P-CSCF to S-CSCF) - see example in table A.3.6-16**

The P-CSCF forwards the PRACK request to the S-CSCF.

Table A.3.6-16: PRACK request (P-CSCF to S-CSCF)

```
PRACK sip:lmaa234269@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Require: precondition
RAck:
Content-Length:
```

17. **PRACK request (S-CSCF to MRFC/AS) - see example in table A.3.6-17**

The S-CSCF forwards the PRACK request to the MRFC/AS.

Table A.3.6-17: PRACK request (S-CSCF to MRFC/AS)

```
PRACK sip:lmaa234269@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
P-Access-Network-Info:
From:
To:
Call-ID:
Cseq:
Require:
RAck:
Content-Length:
```

18. **200 (OK) response (MRFC/AS to S-CSCF) - see example in table A.3.6-18 (related to table A.3.6-17)**

The MRFC/AS acknowledges the PRACK request (17) with a 200 (OK) response.

Table A.3.6-18: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

19. **H.248 interaction to modify connection**

MRFC initiates a H.248 interaction to modify the connection established in step #9 and instructs MRFP to reserve the multimedia processing resources for UE#1 according to the preceding resource negotiation between the UE#1 and the MRFC.

20. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.3.6-20**

The S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.3.6-20: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length:
```

21. **200 (OK) response (P-CSCF to UE) - see example in table A.3.6-21**

The P-CSCF forwards the 200 (OK) response to the UE.

Table A.3.6-21: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length:
```

22. **UPDATE request (UE to P-CSCF) - see example in table A.3.6-22**

When the resource reservation is completed, the UE sends the UPDATE request to the MRFC/AS, via the signalling path established by the INVITE request.

Table A.3.6-22: UPDATE request (UE to P-CSCF)

```
UPDATE sip:lmaa234269@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory1@mrfc1.home1.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 129 UPDATE
Require: sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933617 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telphone-event
```

23. **UPDATE request (P-CSCF to S-CSCF) - see example in table A.3.6-23**

The P-CSCF forwards the UPDATE request to the S-CSCF.

Table A.3.6-23: UPDATE request (P-CSCF to S-CSCF)

```
UPDATE sip:lmaa234269@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024";
   ggsn=[5555::4b4:3c3:2d2:1e1]; pdp-sig=no; gcid=723084371; auth-token=43876559; flow-id=3
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

24. **UPDATE request (S-CSCF to MRFC/AS) - see example in table A.3.6-24**

The S-CSCF forwards the UPDATE request to the MRFC/AS.

Table A.3.6-24: UPDATE request (S-CSCF to MRFC/AS)

```
UPDATE sip:lmaa234269@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
P-Access-Network-Info:
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

25. **200 (OK) response (MRFC/ASto S-CSCF) - see example in table A.3.6-25 (related to table A.3.6-24)**

The MRFC/AS acknowledges the UPDATE request (24) with a 200 (OK) response.

Table A.3.6-25: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933623 2987933625 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::eee:fff:aaa:bbb
t=0 0
m=audio 6544 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote sendrecv
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

The SDP indicates that the resource reservation was successful both in the local and the remote segment.

26. **H.248 interaction to modify connection**

MRFC initiates a H.248 interaction to connect through the multimedia processing resources for UE#1 in MRFP.

27. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.3.6-27**

The S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.3.6-27: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

28. **200 (OK) response (P-CSCF to UE) - see example in table A.3.6-28**

The P-CSCF forwards the 200 (OK) response to the UE.

Table A.3.6-28: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

29. **200 (OK) response (MRFC/AS to S-CSCF) - see example in table A.3.6-29 (related to table A.3.6-6)**

After the success modification of the session (26), the MRFC/AS sends a 200 (OK) response final response to the INVITE request (6) to the S-CSCF.

Table A.3.6-29: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
From:
To:
Call-ID:
CSeq: 127 INVITE
Contact: <sip:conference1@mrfc1.home1.net>;isfocus
Allow-Events: conference, pending-additions
Content-Length:0
```

Contact: Contains the conference URI for the conference allocated at the MRFC/AS and the "isfocus" feature parameter.

Allow-Events: The MRFC/AS indicates support for the "conference" and "pending-additions" event packages

30. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.3.6-30**

The S-CSCF sends a 200 (OK) response final response along the signalling path back to the P-CSCF.

Table A.3.6-30: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
From:
To:
Call-ID:
CSeq:
Contact:
Allow-Events:
Content-Length:
```

31. **Approval of QoS commit**

The P-CSCF approves the commitment of the QoS resources if it was not approved already in step (12).

32. **200 (OK) response (P-CSCF to UE) - see example in table A.3.6-32**

The P-CSCF forwards the 200 (OK) response final response to the session originator. The UE can start the media flow(s) for this session.

Table A.3.6-32: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
From:
To:
Call-ID:
CSeq:
Contact:
Allow-Events:
Content-Length:
```

33. **ACK request (UE to P-CSCF) - see example in table A.3.6-33**

The UE starts the media flow for this session, and responds to the 200(OK) response (32) with an ACK request sent to the P-CSCF.

Table A.3.6-33: ACK request (UE to P-CSCF)

```
ACK sip:conference1@mrfc1.home1.net:2342 SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>From:
   <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory1@mrfc1.home1.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 ACK
Content-Length: 0
```

34. **ACK request (P-CSCF to S-CSCF) - see example in table A.3.6-34**

The P-CSCF forwards the ACK request to the S-CSCF.

Table A.3.6-34: ACK request (P-CSCF to S-CSCF)

```
ACK sip:conference1@mrfc1.home1.net:2342 SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:
```

35. **ACK request (S-CSCF to MRFC/AS) - see example in table A.3.6-35**

The S-CSCF forwards the ACK request to the MRFC/AS.

Table A.3.6-35: ACK request (S-CSCF to MRFC/AS)

```
ACK sip:conference1@mrfc1.home1.net:2342 SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:
```

A.4 Flows demonstrating a user joining a conference

A.4.1 Introduction

Void

A.4.2 User calling into a conference

A.4.2.1 MRFC/AS is not located in user's home network

A.4.2.1.1 Conference URI resolved by the terminating home network

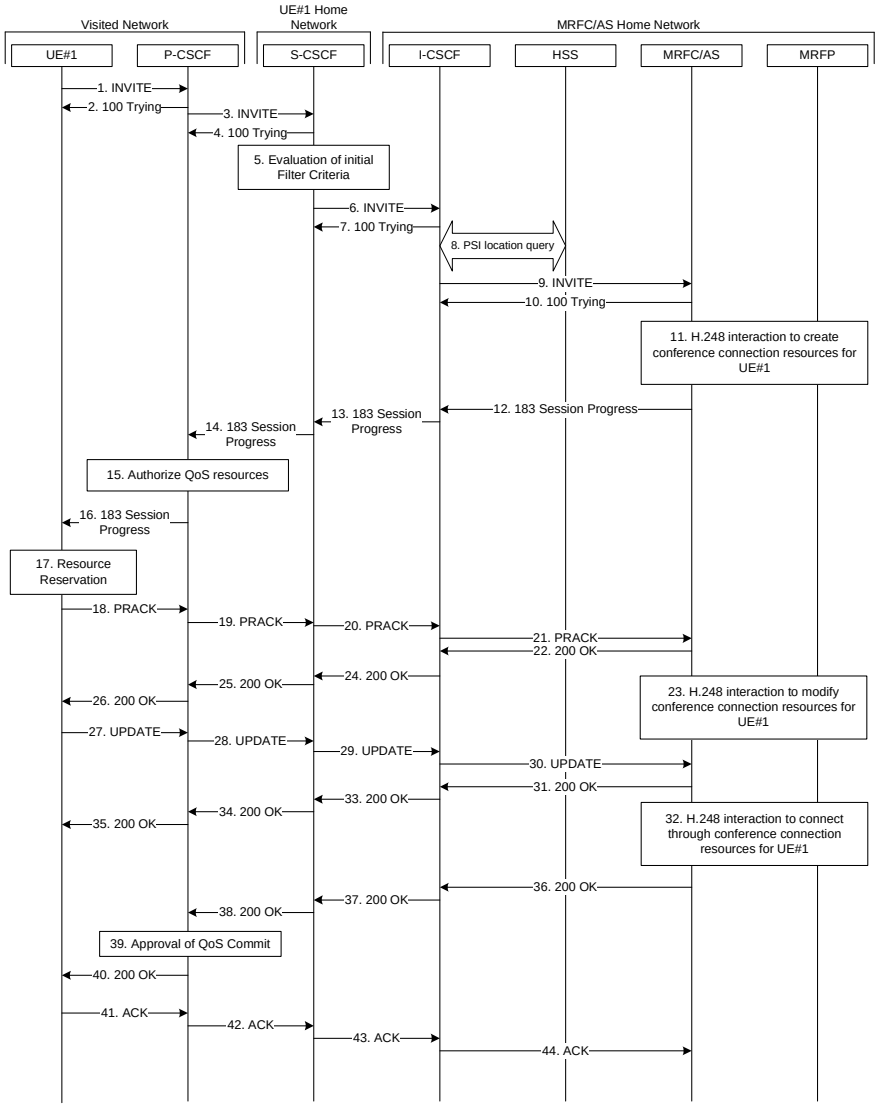

Figure A.4.2.1.1-1: User calling into a conference - network MRFC/AS is not located in user's home network - conference URI resolved by the terminating home network

Figure A.4.2.1.1-1 shows an user calling into a conference by using a conference URI. The focus of that conference is at a MRFC/AS which are located in another network. The conference URI in this example cannot be resolved by the originating home network.

The details of the flows are as follows:

1. **INVITE request (UE to P-CSCF) - see example in table A.4.2.1.1-1**

   A UE wants to join a conference. For this purpose the UE is aware of the related conference URI that was obtained by means outside the present document (e.g. via other protocols, such as http).

   The UE determines the complete set of codecs that it is capable of supporting for this conference. It builds a SDP Offer containing bandwidth requirements and characteristics of each, and assigns local port numbers for each possible media flow. Multiple media flows may be offered, and for each media flow (m= line in SDP), there may be multiple codec choices offered.

For this example, it is assumed that UE#1 is willing to establish a multimedia session comprising a video stream and an audio stream. The video stream supports two codecs, either H.263 or MPEG-4 Visual. The audio stream supports the AMR codec.capable of sending two simultaneous video streams, either H261 or The UE sends the INVITE request to the P-CSCF.

The UEindicates that it supports precondition and it indicates that it supports reliable provisional responses. However, it does not use the "Require' header for these capabilities.

The UE does not have available the resources that are necessary to transport the media.

For this example it is assumed, that signalling encryption was negotiated between UE and P-CSCF in the security mode set-up procedure during the last successful authentication. This option will only be shown in this example.

Table A.4.2.1.1-1: INVITE request (UE to P-CSCF)

```
INVITE sip:conference1@home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference1@home2.net>
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Supported: precondition, 100rel, gruu
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Contact: <sip: user1_public1@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
Accept:application/sdp, application/3gpp-ims+xml
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=video 3400 RTP/AVP 98 99
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99:MPVMP4V-ES
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

Request-URI: contains the conference URI.

2. **100 (Trying) response (P-CSCF to UE) - see example in table A.4.2.1.1-2**

The P-CSCF responds to the INVITE request (1) with a 100 (Trying) response provisional response.

Table A.4.2.1.1-2: 100 (Trying) response (P-CSCF to UE)

```
SIP/2.0 100 (Trying) response
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

3. **INVITE request (P-CSCF to S-CSCF) - see example in table A.4.2.1.1-3**

The P-CSCF forwards the INVITE request to the S-CSCF.

Table A.4.2.1.1-3: INVITE request (P-CSCF to S-CSCF)

```
INVITE sip:conference1@home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:orig@scscf1.home1.net;lr>
Record-Route: <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (…)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

4. **100 (Trying) response (S-CSCF to P-CSCF) - see example in table A.4.2.1.1-4**

   The S-CSCF responds to the INVITE request (3) with a 100 (Trying) response provisional response.

Table A.4.2.1.1-4: 100 (Trying) response (S-CSCF to P-CSCF)

```
SIP/2.0 100 (Trying) response
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

5. **Evaluation of initial filter criteria**

   The S-CSCF validates the service profile of this subscriber and evaluates the initial filter criteria.

6. **INVITE request (S-CSCF to I-CSCF) - see example in table A.4.2.1.1-6**

   The S-CSCF performs an analysis of the destination address, and determines the network operator to whom the destination subscriber belongs. Since the originating operator does not desire to keep their internal configuration hidden, the S-CSCF forwards the INVITE request directly to the I-CSCF in the destination network.

   As the S-CSCF does not know whether the I-CSCF at home2.net is a loose router or not, it does not introduce a Route header.

Table A.4.2.1.1-6: INVITE request (S-CSCF to I-CSCF)

```
INVITE sip:conference1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+358-50-4821437>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

7. **100 (Trying) response (I-CSCF to S-CSCF) - see example in table A.4.2.1.1-7 (related to table A.4.2.1.1-6)**

The I-CSCF responds to the INVITE request (6) with a 100 (Trying) response provisional response.

Table A.4.2.1.1-7: 100 (Trying) response (MRFC/AS to S-CSCF)

```
SIP/2.0 100 (Trying) response
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

8. **Public service identity (PSI) location query**

The I-CSCF sends a query to the HSS to find out the MRFC/AS at which the conference has been created. The HSS responds with the address of the MRFC/AS at which the conference is hosted. The HSS responds with the address of the MRFC/AS.

For detailed message flows see 3GPP TS 29.228 [12].

Table A.4.2.1.1-8a provides the parameters in the SIP INVITE request, which are sent to the HSS.

Table A.4.2.1.1-8a Cx: User location query procedure (I-CSCF to HSS)

Message source and destination	Cx: Information element name	Information source in SIP INVITE	Description
I-CSCF to HSS	Public Service Identity (PSI)	Request-URI:	This information element indicates the public user identity

Table A.4.2.1.1-8b provides the parameters sent from the HSS that need to be mapped to SIP INVITE and sent to MRFC/AS.

Table A.4.2.1.1-8b Cx: User location query procedure (HSS to I-CSCF)

Message source and destination	Cx: Information element name	Mapping to SIP header in SIP INVITE	Description
HSS to I-CSCF	MRFC/AS address	IP packet destination address	This information element indicates the MRFC/AS address which serves the PSI.

9. **INVITE request (I-CSCF to MRFC/AS) - see example in table A.4.2.1.1-9**

I-CSCF forwards the INVITE request to the MRFC/AS that was resolved during the PSI location query (8). The I-CSCF does not re-write the Request URI.

Table A.4.2.1.1-9: INVITE request (I-CSCF to MRFC/AS)

```
INVITE sip:conference1@home2.net SIP/2.0
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 67
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

10. **100 (Trying) response (MRFC/AS to I-CSCF) - see example in table A.4.2.1.1-10 (related to table A.4.2.1.1-9)**

The MRFC/AS responds to the INVITE request (9) with a 100 (Trying) response provisional response.

Table A.4.2.1.1-10: 100 (Trying) response (MRFC/AS to I-CSCF)

```
SIP/2.0 100 (Trying) response
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

11. **H.248 interaction to create conference connection resources for UE#1**

    MRFC initiates a H.248 interaction to create an connection point for UE#1 in MRFP.

12. **183 (Session Progress) response (MRFC/AS to I-CSCF) - see example in table A.4.2.1.1-12 (related to table A.4.2.1.1-9)**

    The media stream capabilities of the conference are returned along the signalling path, in a 183 (Session Progress) provisional response (to 9).

Table A.4.2.1.1-12: 183 (Session Progress) response (MRFC/AS to I-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "Conference Server" <sip:mrfc1.home2.net>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net;
   term-ioi=home2.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy: none
From:
To: <sip:conference1@home2.net>; tag=314159
Call-ID:
CSeq:
Require: precondition, 100rel
Contact: <sip:conference1@home2.net>;isfocus
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY, PUBLISH
RSeq: 9021
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933623 2987933623 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::eee:fff:aaa:bbb
t=0 0
m=video 10001 RTP/AVP 98 99
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=inactive
a=conf:qos remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=audio 6544 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=inactive
a=conf:qos remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

Contact: Contains the conference URI for the conference allocated at the MRFC/AS and the "isfocus" feature parameter.

P-Charging-Vector: The MRFC/AS inserts this header and populates the icid parameters with an unique value and the terminating Inter Operator Identifier (IOI) for the home network of the MRFC/AS and puts back the originating IOI.

P-Charging-Function-Addresses: The MRFC/AS populates the P-Charging-Function-Addresses header field to be passed to the I-CSCF.

13. **183 (Session Progress) response (I-CSCF to S-CSCF) - see example in table A.4.2.1.1-13**

The I-CSCF forwards the 183 (Session Progress) response to the S-CSCF.

Table A.4.2.1.1-13: 183 (Session Progress) response (I-CSCF to S-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net;
   term-ioi=home2.net
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

14. **183 (Session Progress) response (S-CSCF to P-CSCF) - see example in table A.4.2.1.1-14**

The S-CSCF forwards the 183 (Session Progress) response to the P-CSCF.

Table A.4.2.1.1-14: 183 (Session Progress) response (S-CSCF to P-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

15. **Authorize QoS Resources**

The P-CSCF authorizes the resources necessary for this session. The approval of QoS commitment either happens at this stage or after 200 (OK) response of INVITE request (38) based on operator local policy.

16. **183 (Session Progress) response (P-CSCF to UE) - see example in table A.4.2.1.1-16**

The P-CSCF forwards the 183 (Session Progress) response to the originating endpoint.

Table A.4.2.1.1-16: 183 (Session Progress) response (P-CSCF to UE)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

17. **Resource reservation**

The originating UE sets up the bearer in accordance with the media description received SDP.

18. **PRACK request (UE to P-CSCF) - see example in table A.4.2.1.1-18**

The PRACK request does not carry SDP as the final codec decision is already made as part of the initial offer/answer exchange.

Table A.4.2.1.1-18: PRACK request (UE to P-CSCF)

```
PRACK sip:conference1@home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 128 PRACK
Require: precondition, sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
RAck: 9021 127 INVITE
Content-Length: 0
```

Request-URI: takes the value of the Contact header of the received 183 (Session Progress) response.

19. **PRACK request (P-CSCF to S-CSCF) - see example in table A.4.2.1.1-19**

The P-CSCF forwards the PRACK request to the S-CSCF.

Table A.4.2.1.1-19: PRACK request (P-CSCF to S-CSCF)

```
PRACK sip:conference1@home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Require: precondition
RAck:
Content-Length:
```

20. **PRACK request (S-CSCF to I-CSCF) - see example in table A.4.2.1.1-20**

The S-CSCF performs an analysis of the destination address, and determines the network operator to whom the destination subscriber belongs. Since the originating operator does not desire to keep their internal configuration hidden, the S-CSCF forwards the PRACK request directly to the I-CSCF in the destination network.

As the S-CSCF does not know whether the I-CSCF at home2.net is a loose router or not, it does not introduce a Route header.

Table A.4.2.1.1-20: PRACK request (S-CSCF to I-CSCF)

```
PRACK sip:conference1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Require:
RAck:
Content-Length:
```

21. **PRACK request (I-CSCF to MRFC/AS) - see example in table A.4.2.1.1-21**

I-CSCF forwards the PRACK request to the MRFC/AS that was resolved during the PSI location query (8).

Table A.4.2.1.1-21: PRACK request (I-CSCF to MRFC/AS)

```
PRACK sip:conference1@home2.net SIP/2.0
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 67
From:
To:
Call-ID:
Cseq:
Require:
RAck:
Content-Length:
```

22. **200 (OK) response (MRFC/AS to I-CSCF) - see example in table A.4.2.1.1-22 (related to table A.4.2.1.1-21)**

The MRFC/AS acknowledges the PRACK request (21) with a 200 (OK) response.

Table A.4.2.1.1-22: 200 (OK) response (MRFC/AS to I-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

23. **H.248 interaction to modify connection for UE#1**

MRFC initiates a H.248 interaction to modify the connection established in step #11 and instructs MRFP to reserve the multimedia processing resources for UE#1 according to the preceding resource negotiation between the UE#1 and the MRFC.

24. **200 (OK) response (I-CSCF to S-CSCF) - see example in table A.4.2.1.1-24**

The I-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.4.2.1.1-24: 200 (OK) response (I-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length:
```

25. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.4.2.1.1-25**

S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.4.2.1.1-25: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length:
```

26. **200 (OK) response (P-CSCF to UE) - see example in table A.4.2.1.1-26**

The P-CSCF forwards the 200 (OK) response to the UE.

Table A.4.2.1.1-26: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length:
```

27. **UPDATE request (UE to P-CSCF) - see example in table A.4.2.1.1-27**

When the resource reservation is completed, the UE sends the UPDATE request to the MRFC/AS, via the signalling path established by the INVITE request.

Table A.4.2.1.1-27: UPDATE request (UE to P-CSCF)

```
UPDATE sip:conference1@home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 129 UPDATE
Require: sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933617 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=video 0 RTP/AVPF 98
b=AS:75
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 3456 RTP/AVPF 97 96
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telphone-event
```

Request-URI: takes the value of the Contact header of the received 183 (Session Progress) response.

28. **UPDATE request (P-CSCF to S-CSCF) - see example in table A.4.2.1.1-28**

The P-CSCF forwards the UPDATE request to the S-CSCF.

Table A.4.2.1.1-28: UPDATE request (P-CSCF to S-CSCF)

```
UPDATE sip:conference1@home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024";
   ggsn=[5555::4b4:3c3:2d2:1e1]; pdp-sig=no; gcid=723084371; auth-token=43876559; flow-id=3
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
m=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

29. **UPDATE request (S-CSCF to I-CSCF) - see example in table A.4.2.1.1-29**

The S-CSCF performs an analysis of the destination address, and determines the network operator to whom the destination subscriber belongs. Since the originating operator does not desire to keep their internal configuration hidden, the S-CSCF forwards the UPDATE request directly to the I-CSCF in the destination network.

As the S-CSCF does not know whether the I-CSCF at home2.net is a loose router or not, it does not introduce a Route header.

Table A.4.2.1.1-29: UPDATE request (S-CSCF to I-CSCF)

```
UPDATE sip:conference1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
m=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

30. **UPDATE request (I-CSCF to MRFC/AS) - see example in table A.4.2.1.1-30**

I-CSCF forwards the UPDATE request to the MRFC/AS that was resolved during the PSI location query (8). The I-CSCF does not re-write the Request URI.

Table A.4.2.1.1-30: UPDATE request (I-CSCF to MRFC/AS)

```
UPDATE sip:conference1@home2.net SIP/2.0
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 67
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
m=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

31. **200 (OK) response (MRFC/AS to I-CSCF) - see example in table A.4.2.1.1-31 (related to table A.4.2.1.1-30)**

The MRFC/AS acknowledges the UPDATE request (30) with a 200 (OK) response.

Table A.4.2.1.1-31: 200 (OK) response (MRFC/AS to I-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933623 2987933625 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::eee:fff:aaa:bbb
t=0 0
m=video 0 RTP/AVP 98
b=AS:75
a=curr:qos local sendrecv
a=curr:qos remote sendrecv
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 6544 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote sendrecv
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

The SDP indicates that the resource reservation was successful both in the local and the remote segment.

32. **H.248 interaction to modify connection**

MRFC initiates a H.248 interaction to connect through the multimedia processing resources for UE#1 in MRFP.

33. **200 (OK) response (I-CSCF to S-CSCF) - see example in table A.4.2.1.1-31**

The I-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.4.2.1.1-31: 200 (OK) response (I-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type: application/sdp
Content-Length: (…)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

34. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.4.2.1.1-34**

The S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.4.2.1.1-34: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

35. **200 (OK) response (P-CSCF to UE) - see example in table A.4.2.1.1-35**

The P-CSCF forwards the 200 (OK) response to the UE.

Table A.4.2.1.1-35: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

36. **200 (OK) response (MRFC/AS to I-CSCF) - see example in table A.4.2.1.1-36 (related to table A.4.2.1.1-9)**

After the success modification of the session (32), the MRFC/AS sends a 200 (OK) response final response to the INVITE request (9) to the I-CSCF.

Table A.4.2.1.1-36: 200 (OK) response (MRFC/AS to I-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
From:
To:
Call-ID:
CSeq: 127 INVITE
Contact: <sip:conference1@home2.net>;isfocus
Allow-Events: conference, pending-additions
Content-Length:0
```

Contact: contains the conference URI for the conference allocated at the MRFC/AS and the "isfocus" feature parameter.

Allow-Events: The MRFC/AS indicates support for the "conference" and "pending-additions" event packages

37. **200 (OK) response (I-CSCF to S-CSCF) - see example in table A.4.2.1.1-37**

The I-CSCF sends a 200 (OK) response final response along the signalling path back to the S-CSCF.

Table A.4.2.1.1-37: 200 (OK) response (I-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
From:
To:
Call-ID:
CSeq:
Contact:
Allow-Events:
Content-Length:
```

38. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.4.2.1.1-38**

The S-CSCF sends a 200 (OK) response final response along the signalling path back to the P-CSCF.

Table A.4.2.1.1-38: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
From:
To:
Call-ID:
CSeq:
Contact:
Allow-Events:
Content-Length:
```

39. **Approval of QoS commit**

The P-CSCF approves the commitment of the QoS resources if it was not approved already in step (15).

40. **200 (OK) response (P-CSCF to UE) - see example in table A.4.2.1.1-40**

The P-CSCF forwards the 200 (OK) response final response to the session originator. The UE can start the media flow(s) for this session.

Table A.4.2.1.1-40: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
From:
To:
Call-ID:
CSeq:
Contact:
Allow-Events:
Content-Length:
```

41. **ACK request (UE to P-CSCF) - see example in table A.4.2.1.1-41**

The UE starts the media flow for this session, and responds to the 200(OK) response (40) with an ACK request sent to the P-CSCF.

Table A.4.2.1.1-41: ACK request (UE to P-CSCF)

```
ACK sip:conference1@home2.net:2342 SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 ACK
Content-Length: 0
```

42. **ACK request (P-CSCF to S-CSCF) - see example in table A.4.2.1.1-42**

The P-CSCF forwards the ACK request to the S-CSCF.

Table A.4.2.1.1-42: ACK request (P-CSCF to S-CSCF)

```
ACK sip:conference1@home2.net:2342 SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:
```

43. **ACK request (S-CSCF to I-CSCF) - see example in table A.4.2.1.1-43**

The S-CSCF performs an analysis of the destination address, and determines the network operator to whom the destination subscriber belongs. Since the originating operator does not desire to keep their internal configuration hidden, the S-CSCF forwards the ACK request directly to the I-CSCF in the destination network.

As the S-CSCF does not know whether the I-CSCF at home2.net is a loose router or not, it does not introduce a Route header.

Table A.4.2.1.1-43: ACK request (S-CSCF to I-CSCF)

```
ACK sip:conference1@home2.net:2342 SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:
```

44. **ACK request (I-CSCF to MRFC/AS) - see example in table A.4.2.1.1-44**

I-CSCF forwards the ACK request to the MRFC/AS that was resolved during the PSI location query (8). The I-CSCF does not re-write the Request URI.

Table A.4.2.1.1-44: ACK request (I-CSCF to MRFC/AS)

```
ACK sip:conference1@home2.net:2342 SIP/2.0
Via: SIP/2.0/UDP icscf2_s.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 67
From:
To:
Call-ID:
Cseq:
Content-Length:
```

A.4.2.1.2 Conference URI can be resolved by the originating home network

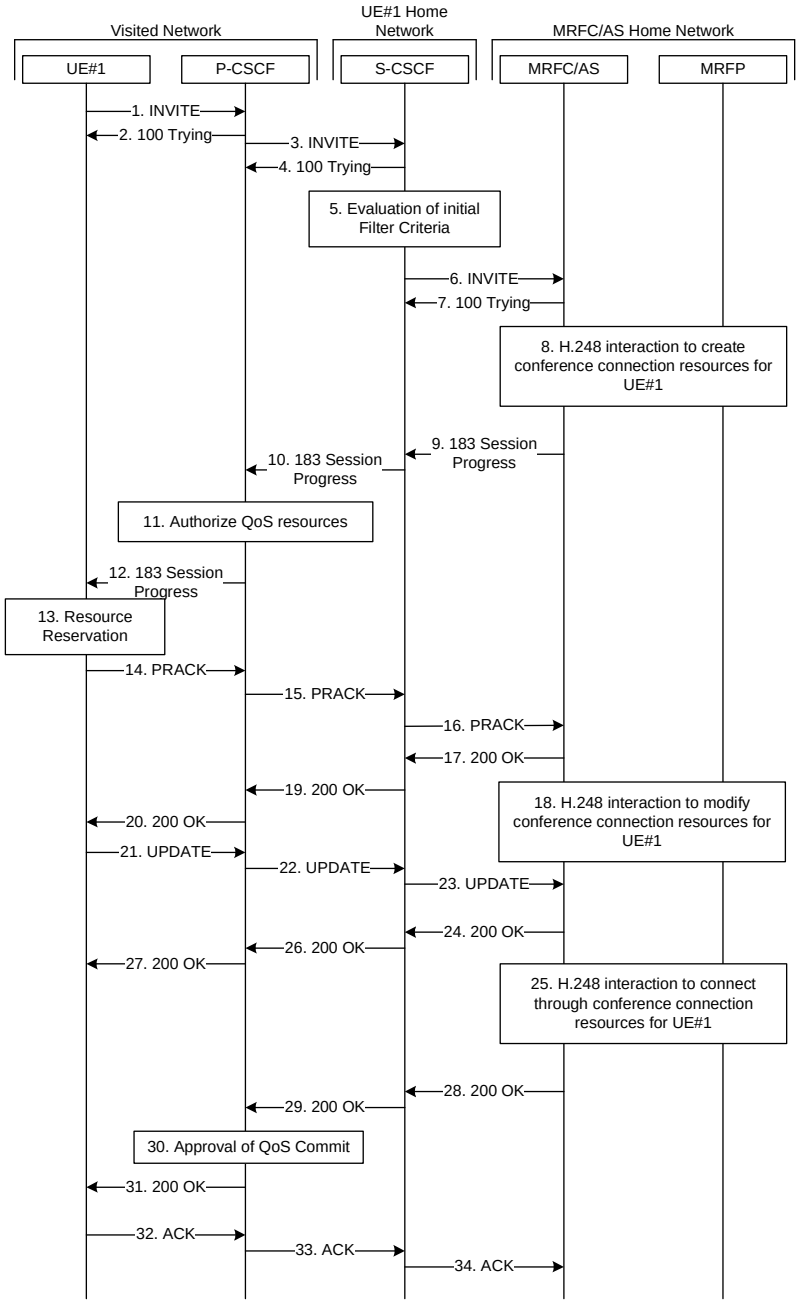

Figure A.4.2.1.2-1: User calling into a conference - MRFC/AS is not located in user's home network - conference URI can be resolved by the originating home network

Figure A.4.2.1.2-1 shows an user calling into a conference by using a conference URI. The focus of that conference is at a MRFC/AS which are located in another network. The conference URI in this example can be resolved by the originating home network.

The details of the flows are as follows:

1. **INVITE request (UE to P-CSCF) - see example in table A.4.2.1.2-1**

   A UE wants to join a conference. For this purpose the UE is aware of the related conference URI that was obtained by means outside the present document.

   The UE determines the complete set of codecs that it is capable of supporting for this conference. It builds a SDP Offer containing bandwidth requirements and characteristics of each, and assigns local port numbers for

each possible media flow. Multiple media flows may be offered, and for each media flow (m= line in SDP), there may be multiple codec choices offered.

For this example, it is assumed that UE#1 is willing to establish a multimedia session comprising a video stream and an audio stream. The video stream supports two codecs, either H.263 or MPEG-4 Visual. The audio stream supports the AMR codec.

The UEindicates that it supports precondition and it indicates that it supports reliable provisional responses. However, it does not use the "Require' header for these capabilities.

The UE does not have available the resources that are necessary to transport the media.

For this example it is assumed, that signalling encryption was negotiated between UE and P-CSCF in the security mode set-up procedure during the last successful authentication. This option will only be shown in this example.

Table A.4.2.1.2-1: INVITE request (UE to P-CSCF)

```
INVITE sip:conference1@mrfc2.home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference1@mrfc2.home2.net>
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Supported: precondition, 100rel, gruu, 199
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Contact: <sip:user1_public1@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
Accept:application/sdp, application/3gpp-ims+xml
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=video 3400 RTP/AVP 98 99
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99:MP4V-ES
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

Request-URI: contains the conference URI.

2. **100 (Trying) response (P-CSCF to UE) - see example in table A.4.2.1.2-2**

The P-CSCF responds to the INVITE request (1) with a 100 (Trying) response provisional response.

Table A.4.2.1.2-2: 100 (Trying) response (P-CSCF to UE)

```
SIP/2.0 100 (Trying) response
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

3. **INVITE request (P-CSCF to S-CSCF) - see example in table A.4.2.1.2-3**

The INVITE request is forwarded to the S-CSCF.

Table A.4.2.1.2-3: INVITE request (P-CSCF to S-CSCF)

```
INVITE sip:conference1@mrfc2.home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:orig@scscf1.home1.net;lr>
Record-Route: <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (…)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

4. **100 (Trying) response (S-CSCF to P-CSCF) - see example in table A.4.2.1.2-4**

   The S-CSCF responds to the INVITE request (3) with a 100 (Trying) response provisional response.

Table A.4.2.1.2-4: 100 (Trying) response (S-CSCF to P-CSCF)

```
SIP/2.0 100 (Trying) response
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

5. **Evaluation of initial filter criteria**

   The S-CSCF validates the service profile of this subscriber and evaluates the initial filter criteria.

6. **INVITE request (S-CSCF to MRFC/AS) - see example in table A.4.2.1.2-6**

   S-CSCF forwards the INVITE request to the MRFC/AS based on the Request URI of the INVITE request. The S-CSCF does not re-write the Request URI.

Table A.4.2.1.2-6: INVITE request (S-CSCF to MRFC/AS)

```
INVITE sip:conference1@mrfc2.home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+358-50-4821437>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

7. **100 (Trying) response (MRFC/AS to S-CSCF) - see example in table A.4.2.1.2-7 (related to table A.4.2.1.2-6)**

   The MRFC/AS responds to the INVITE request (6) with a 100 (Trying) response provisional response.

Table A.4.2.1.2-7: 100 (Trying) response (MRFC/AS to S-CSCF)

```
SIP/2.0 100 (Trying) response
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

8. **H.248 interaction to create conference connection resources for UE#1**

   MRFC initiates a H.248 interaction to create an connection point for UE#1 in MRFP.

9. **183 (Session Progress) response (MRFC/AS to S-CSCF) - see example in table A.4.2.1.2-9 (related to table A.4.2.1.2-6)**

The media stream capabilities of the conference are returned along the signalling path, in a 183 (Session Progress) provisional response (to 6).

Table A.4.2.1.2-9: 183 (Session Progress) response (MRFC/AS to S-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "Conference Server" <sip:mrfc1.home1.net>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net;
   term-ioi=home2.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy: none
From:
To: <sip:conference1@mrfc2.home2.net>; tag=314159
Call-ID:
CSeq:
Require: precondition, 100rel
Contact: <sip:conference1@mrfc2.home2.net>;isfocus
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY, PUBLISH
RSeq: 9021
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933623 2987933623 IN IP6 5555::1111:2222:3333:4444
s=-
c=IN IP6 5555::1111:2222:3333:4444
t=0 0
m=video 10001 RTP/AVP 98 99
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=inactive
a=conf:qos remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=audio 6544 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=inactive
a=conf:qos remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

Contact: Contains the conference URI for the conference allocated at the MRFC/AS and the "isfocus" feature parameter.

P-Charging-Vector: The MRFC/AS inserts this header and populates the icid parameters with an unique value and the terminating Inter Operator Identifier (IOI) for the home network of the MRFC/AS and puts back the originating IOI.

P-Charging-Function-Addresses: The MRFC/AS populates the P-Charging-Function-Addresses header field to be passed to the S-CSCF.

10. **183 (Session Progress) response (S-CSCF to P-CSCF) - see example in table A.4.2.1.2-10**

The S-CSCF forwards the 183 (Session Progress) response to the P-CSCF.

Table A.4.2.1.2-10: 183 (Session Progress) response (S-CSCF to P-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

11. **Authorize QoS Resources**

The P-CSCF authorizes the resources necessary for this session. The approval of QoS commitment either happens at this stage or after 200(OK) response to the INVITE request (30) based on operator local policy.

12. **183 (Session Progress) response (P-CSCF to UE) - see example in table A.4.2.1.2-12**

    The P-CSCF forwards the 183 (Session Progress) response to the originating endpoint.

Table A.4.2.1.2-12: 183 (Session Progress) response (P-CSCF to UE)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

13. **Resource reservation**

    The originating UE sets up the bearer in accordance with the media description received SDP.

14. **PRACK request (UE to P-CSCF) - see example in table A.4.2.1.2-14**

    The PRACK request does not carry SDP as the final codec decision is already made as part of the initial offer/answer exchange.

Table A.4.2.1.2-14: PRACK request (UE to P-CSCF)

```
PRACK sip:conference1@mrfc2.home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference1@mrfc2.home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 128 PRACK
Require: precondition, sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
RAck: 9021 127 INVITE
Content-Length: 0
```

Request-URI: takes the value of the Contact header of the received 183 (Session Progress) response.

15. **PRACK request (P-CSCF to S-CSCF) - see example in table A.4.2.1.2-15**

The P-CSCF forwards the PRACK request to the S-CSCF.

Table A.4.2.1.2-15: PRACK request (P-CSCF to S-CSCF)

```
PRACK sip:conference1@mrfc2.home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Require: precondition
RAck:
Content-Length:
```

16. **PRACK request (S-CSCF to MRFC/AS) - see example in table A.4.2.1.2-16**

S-CSCF forwards the PRACK request to the MRFC/AS based on the Request URI of the PRACK request. The S-CSCF does not re-write the Request URI.

Table A.4.2.1.2-16: PRACK request (S-CSCF to MRFC/AS)

```
PRACK sip:conference1@mrfc2.home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Require:
RAck:
Content-Length:
```

17. **200 (OK) response (MRFC/AS to S-CSCF) - see example in table A.4.2.1.2-17 (related to table A.4.2.1.2-16)**

The MRFC/AS acknowledges the PRACK request (16) with a 200 (OK) response.

Table A.4.2.1.2-17: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

18. **H.248 interaction to modify connection for UE#1**

MRFC initiates a H.248 interaction to modify the connection established in step #11 and instructs MRFP to reserve the multimedia processing resources for UE#1 according to the preceding resource negotiation between the UE#1 and the MRFC.

19. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.4.2.1.2-19**

S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.4.2.1.2-19: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length:
```

20. **200 (OK) response (P-CSCF to UE) - see example in table A.4.2.1.2-20**

The P-CSCF forwards the 200 (OK) response to the UE.

Table A.4.2.1.2-20: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Length:
```

21. **UPDATE request (UE to P-CSCF) - see example in table A.4.2.1.2-21**

When the resource reservation is completed, the UE sends the UPDATE request to the MRFC/AS, via the signalling path established by the INVITE request.

Table A.4.2.1.2-21: UPDATE request (UE to P-CSCF)

```
UPDATE sip:conference1@mrfc2.home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference1@mrfc2.home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 129 UPDATE
Require: sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933617 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=video 0 RTP/AVP 98
b=AS:75
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telphone-event
```

Request-URI: takes the value of the Contact header of the received 183 (Session Progress) response.

22. **UPDATE request (P-CSCF to S-CSCF) - see example in table A.4.2.1.2-22**

The P-CSCF forwards the UPDATE request to the S-CSCF.

Table A.4.2.1.2-22: UPDATE request (P-CSCF to S-CSCF)

```
UPDATE sip:conference1@mrfc2.home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024";
   ggsn=[5555::4b4:3c3:2d2:1e1]; pdp-sig=no; gcid=723084371; auth-token=43876559; flow-id=3
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
m=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

23. **UPDATE request (S-CSCF to MRFC/AS) - see example in table A.4.2.1.2-23**

S-CSCF forwards the UPDATE request to the MRFC/AS based on the Request URI of the UPDATE request. The S-CSCF does not re-write the Request URI.

Table A.4.2.1.2-23: UPDATE request (S-CSCF to MRFC/AS)

```
UPDATE sip:conference1@mrfc2.home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
m=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

24. **200 (OK) response (MRFC/AS to S-CSCF) - see example in table A.4.2.1.2-24 (related to table A.4.2.1.2-23)**

The MRFC/AS acknowledges the UPDATE request (23) with a 200 (OK) response.

Table A.4.2.1.2-24: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933623 2987933625 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::eee:fff:aaa:bbb
t=0 0
m=video 0 RTP/AVP 98
b=AS:75
a=curr:qos local sendrecv
a=curr:qos remote sendrecv
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 6544 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote sendrecv
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

The SDP indicates that the resource reservation was successful both in the local and the remote segment.

25. **H.248 interaction to modify connection**

MRFC initiates a H.248 interaction to connect through the multimedia processing resources for UE#1 in MRFP.

26. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.4.2.1.2-26**

The S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.4.2.1.2-26: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

27. **200 (OK) response (P-CSCF to UE) - see example in table A.4.2.1.2-27**

The P-CSCF forwards the 200 (OK) response to the UE.

Table A.4.2.1.2-27: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

28. **200 (OK) response (MRFC/AS to S-CSCF) - see example in table A.4.2.1.2-28 (related to table A.4.2.1.2-7)**

After the success modification of the session (25), the MRFC/AS sends a 200 (OK) response final response to the INVITE request (6) to the I-CSCF.

Table A.4.2.1.2-28: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
From:
To:
Call-ID:
CSeq: 127 INVITE
Contact: <sip:conference1@mrfc2.home2.net>;isfocus
Allow-Events: conference , pending-additions
Content-Length:0
```

Contact: contains the conference URI for the conference allocated at the MRFC/AS and the "isfocus" feature parameter.

Allow-Events: The MRFC/AS indicates support for the "conference" and "pending-additions" event packages

29. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.4.2.1.2-29**

The S-CSCF sends a 200 (OK) response final response along the signalling path back to the P-CSCF.

Table A.4.2.1.2-29: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
From:
To:
Call-ID:
CSeq:
Contact:
Allow-Events:
Content-Length:
```

30. **Approval of QoS commit**

The P-CSCF approves the commitment of the QoS resources if it was not approved already in step (14).

31. **200 (OK) response (P-CSCF to UE) - see example in table A.4.2.1.2-31**

The P-CSCF forwards the 200 (OK) response final response to the session originator. The UE can start the media flow(s) for this session.

Table A.4.2.1.2-31: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
From:
To:
Call-ID:
CSeq:
Contact:
Allow-Events:
Content-Length:
```

32. **ACK request (UE to P-CSCF) - see example in table A.4.2.1.2-32**

The UE starts the media flow for this session, and responds to the 200 (OK) response (31) with an ACK request sent to the P-CSCF.

Table A.4.2.1.2-32: ACK request (UE to P-CSCF)

```
ACK sip:conference1@mrfc2.home2.net:2342 SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference1@mrfc2.home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 ACK
Content-Length: 0
```

Cseq: is required to be the same value as Cseq contained in original INVITE request (3).

33. **ACK request (P-CSCF to S-CSCF) - see example in table A.4.2.1.2-33**

The P-CSCF forwards the ACK request to the S-CSCF.

Table A.4.2.1.2-33: ACK request (P-CSCF to S-CSCF)

```
ACK sip:conference1@mrfc2.home2.net:2342 SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:scscf1.home1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:
```

34. **ACK request (S-CSCF to MRFC/AS) - see example in table A.4.2.1.2-34**

S-CSCF forwards the ACK request to the MRFC/AS based on the Request URI of the ACK request. The S-CSCF does not re-write the Request URI.

Table A.4.2.1.2-34: ACK request (S-CSCF to MRFC/AS)

```
ACK sip:conference1@mrfc2.home2.net:2342 SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:
```

A.4.3 User getting invited to a conference

A.4.3.1 MRFC/AS is not located in user's home network

A.4.3.1.1 Conference Participant referring another user to a conference

Figure A.4.3.1.1-1 shows how UE#1 refers UE#2 to a conference. UE#1 has created a conference by using the mechanisms described in subclause 6.2, and UE#1 has learned the conference URI that identifies this conference.

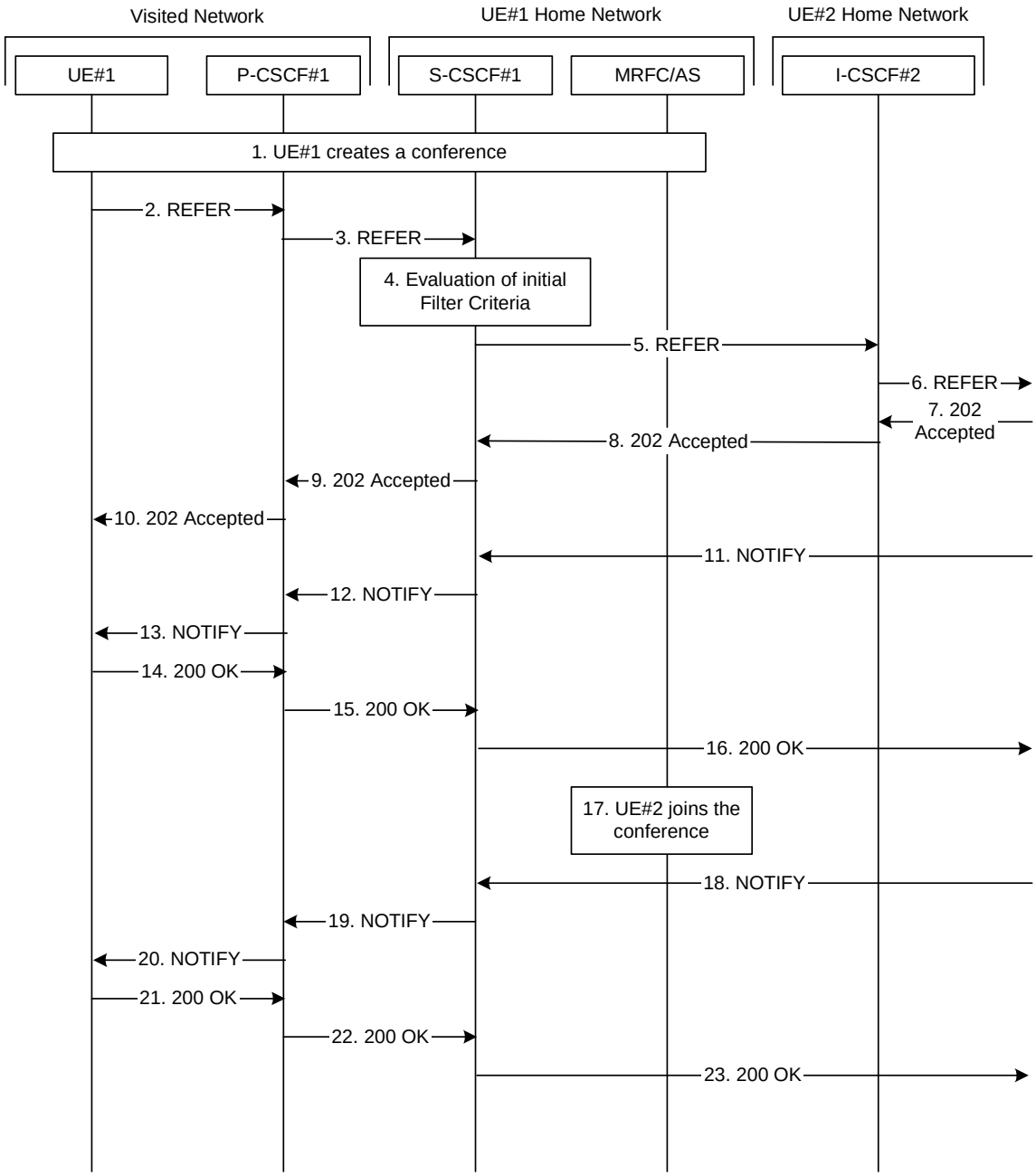

Figure A.4.3.1.1-1: User inviting another user to a conference by sending a REFER request to the other user

The details of the flows are as follows:

1. **UE#1 creates a conference**

   UE#1 creates a conference as described in subclause 6.3.2. Once the conference creation is accomplished, UE#1 has learned the conference URI allocated for this conference.

2. **REFER request (UE to P-CSCF) - see example in table A.4.3.1.1-2**

A UE has created a conference and learned the conference URI. Now the UE wants to invite another UE to that conference.

Table A.4.3.1.1-2: REFER request (UE to P-CSCF)

```
REFER sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:user2_public1@home2.net>
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 REFER
Require: sec-agree
Refer-To: <sip:conference1@mrfc1.home1.net;method=INVITE>
Referred-By: <sip:user1_public1@home1.net>
Proxy-Require: sec-agree
Supported: gruu
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Contact: <sip:user1_public1@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp>
Content-Length: 0
```

Request-URI: contains the public user identity of UE#2.

Via: contains the IP address or FQDN of the originating UE.

Refer-To: contains the conference URI as learned during the conference establishment. Additionally the "method" uri parameter indicates that the other user is requested to send an INVITE request to this conference URI.

Referred-By: contains the public user identity of the referring user, as in this example the referring user has decided to indicate its own identity to the referred user.

3. **REFER request (P-CSCF to S-CSCF) - see example in table A.4.3.1.1-3**

The P-CSCF forwards the REFER request to the S-CSCF.

Table A.4.3.1.1-3: REFER request (P-CSCF to S-CSCF)

```
REFER sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:orig@scscf1.home1.net;lr>
Record-Route: <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"
P-Access-Network-Info:
Privacy:
From:
To:
Call-ID:
Cseq:
Refer-To:
Referred-By:
Supported:
Contact:
Content-Length:
```

4. **Evaluation of initial Filter Criteria**

   The S-CSCF validates the service profile of this subscriber and evaluates the initial filter criteria.

5. **REFER request (S-CSCF to I-CSCF in UE#2 home network) - see example in table A.4.3.1.1-5**

   The S-CSCF performs an analysis of the destination address, and determines the network operator to whom the destination subscriber belongs. Since the originating operator does not desire to keep their internal configuration hidden, the S-CSCF forwards the REFER request directly to the destination network.

Table A.4.3.1.1-5: REFER request (S-CSCF to I-CSCF)

```
REFER sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+358-50-4821437>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"; orig-ioi=home1.net
Privacy:
From:
To:
Call-ID:
Cseq:
Refer-To:
Referred-By:
Supported:
Contact:
Content-Length:
```

6. **REFER request (I-CSCF towards S-CSCF of UE#2) - see example in table A.4.3.1.1-6**

   The I-CSCF performs a Cx location query to the HSS (not shown in this flow) to find out the S-CSCF of UE#2.

   The I-CSCF then forwards the REFER request to that S-CSCF that will handle the session termination.

Table A.4.3.1.1-6: REFER request (I-CSCF towards S-CSCF of UE#2)

```
REFER sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP icscf2.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 67
Route: <sip:scscf2.home2.net;lr>
Record-Route:
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"; orig-ioi=home1.net
Privacy:
From:
To:
Call-ID:
Cseq:
Refer-To:
Referred-By:
Supported:
Contact:
Content-Length:
```

7. **202 (Accepted) response (S-CSCF of UE#2 to I-CSCF) - see example in table A.4.3.1.1-7**

   UE#2 home network indicates that it has received the REFER request by sending a 202 (Accepted) response. This means that UE#2 home network has begun to process the request. This does not mean, however, that the referred-to resource would have been contacted.

Table A.4.3.1.1-7: 202 (Accepted) response (S-CSCF of UE#2 to I-CSCF)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP icscf2.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:pcscf2.visited2.net;lr>, <sip:scscf2.home2.net;lr>,
   <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>, <tel:+1-212-555-2222>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"; icid-generated-
   at=[5555::f5f:e4e:d3d:c2c]; orig-ioi=home1.net; term-ioi=home2.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy:none
From: <sip:user1_public1@home1.net>;tag=171828
To: <sip:user2_public1@home2.net>;tag=151170
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 127 REFER
Contact:user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-
   ad76cc7fc74;comp=sigcomp>
Content-Length:0
```

8. **202 (Accepted) response (I-CSCF to S-CSCF) - see example in table A.4.3.1.1-8**

   The I-CSCF forwards the response to the S-CSCF.

Table A.4.3.1.1-8: 202 (Accepted) response (I-CSCF to S-CSCF)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024";; orig-ioi=home1.net;
   term-ioi=home2.net
Privacy:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:
```

9. **202 (Accepted) response (S-CSCF to P-CSCF) - see example in table A.4.3.1.1-9**

   The S-CSCF forwards the response to the P-CSCF.

Table A.4.3.1.1-9: 202 (Accepted) response (S-CSCF to P-CSCF)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"
Privacy:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:
```

10. **202 (Accepted) response (P-CSCF to UE#1) - see example in table A.4.3.1.1-10**

The P-CSCF forwards the response to the UE.

Table 6.3.3.1-10: 202 (Accepted) response (P-CSCF to UE#1)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:pcscf2.visited2.net;lr>, <sip:scscf2.home2.net;lr>,
   <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:0
```

11. **NOTIFY request (from S-CSCF of UE#2 to S-CSCF) - see example in table A.4.3.1.1-11**

S-SCSF receives a NOTIFY request corresponding the REFER request. The NOTIFY request contains information about the progress of the REFER request processing. The body of the NOTIFY request contains a fragment of the response as received by the notifying UE for the request that was initiated due to the REFER request. The NOTIFY request is forwarded to the P-CSCF.

Table A.4.3.1.1-11: NOTIFY request (from S-CSCF of UE#2 to S-CSCF)

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch= z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=223551024"; orig-ioi=home2.net
Max-Forwards: 68
Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
To: <sip:user1_public1@home1.net>;tag=171828
From: <sip:user2_public1@home2.net>;tag=151170
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 42 NOTIFY
Subscription-State: active;expires:7200
Event: refer
Contact: <sip:user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-ad76cc7fc74
   ;comp=sigcomp>
Content-Length: (…)
Content-Type: message/sipfrag

SIP/2.0 100 (Trying) response
```

12. **NOTIFY request (from S-CSCF to P-CSCF) - see example in table A.4.3.1.1-12**

The S-CSCF forwards the message to the P-CSCF.

Table: A.4.3.1.1-12: NOTIFY request (from S-CSCF to P-CSCF)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=223551024"
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Max-Forwards: 67
Route: <sip:pcscf1.visited1.net;lr>
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Length: (…)
Content-Type:

(...)
```

13. **NOTIFY request (from P-CSCF to UE#1) - see example in table A.4.3.1.1-13**

The P-CSCF forwards the message to UE#1.

Table A.4.3.1.1-13: NOTIFY request (from P-CSCF to UE#1)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net:7531;comp=sigcomp;branch=z9hG4bK23433.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 66
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Length: (…)
Content-Type:

(...)
```

14. **200 (OK) response (UE to P-CSCF) - see example in table A.4.3.1.1-14**

The UE acknowledges the NOTIFY request with a 200 (OK) response to the P-CSCF.

Table A.4.3.1.1-14: 200 (OK) response (UE to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net:7531;comp=sigcomp;branch=z9hG4bK23433.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

15. **200 (OK) response (P-CSCF to S-CSCF) - see example in table A.4.3.1.1-15**

The P-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.4.3.1.1-15: 200 (OK) response (P-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=223551024"
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

16. **200 (OK) response (S-CSCF to S-CSCF of UE#2) - see example in table A.4.3.1.1-16**

The S-CSCF forwards the 200 (OK) response to the S-CSCF of UE#2 according to the information in the Via field.

Table A.4.3.1.1-16: 200 (OK) response (S-CSCF to S-CSCF of UE#2)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=223551024"; orig-ioi=home1.net;
   term-ioi=home1.net
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

17. **UE#2 joins the conference.**

UE#2 joins the conference. The message flows are depicted in subclause 6.3.2.

18. **NOTIFY request (from S-CSCF of UE#2 to S-CSCF) - see example in table A.4.3.1.1-18**

S-SCSF receives a NOTIFY request corresponding the REFER request.

Table A.4.3.1.1-18: NOTIFY request (from S-CSCF of UE#2 to S-CSCF)

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK23d244.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=323551024"; orig-ioi=home2.net
Max-Forwards: 68
Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
To: <sip:user1_public1@home1.net>; tag=171828
From: <sip:user2_public1@home2.net>;tag=151170
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 43 NOTIFY
Subscription-State: terminated
Event: refer
Content-Length: (…)
Content-Type: message/sipfrag

SIP/2.0 200 OK
```

Subscription-State: indicates that the implicit subscription to the refer event has been terminated.

19. **NOTIFY request (from S-CSCF to P-CSCF) - see example in table A.4.3.1.1-19**

The S-CSCF forwards the NOTIFY request to the P-CSCF.

Table A.4.3.1.1-19: NOTIFY request (from S-CSCF to P-CSCF)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK23d244.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=323551024"
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Max-Forwards: 67
Route: <sip:pcscf1.visited1.net;lr>
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Content-Length: (…)
Content-Type:

(...)
```

20. **NOTIFY request (from P-CSCF to UE#1) - see example in table A.4.3.1.1-20**

The P-CSCF forwards the NOTIFY request to UE#1.

Table A.4.3.1.1-20: NOTIFY request (from P-CSCF to UE#1)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net:7531;comp=sigcomp;branch=z9hG4bK23433.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK23d244.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 66
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Content-Length: (…)
Content-Type:

(...)
```

21. **200 (OK) response (UE to P-CSCF) - see example in table A.4.3.1.1-21**

The UE acknowledges the NOTIFY request with a 200 (OK) response to the P-CSCF.

Table A.4.3.1.1-21: 200 (OK) response (UE to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net:7531;comp=sigcomp;branch=z9hG4bK23433.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK23d244.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

22. **200 (OK) response (P-CSCF to S-CSCF) - see example in table A.4.3.1.1-22**

The P-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.4.3.1.1-22: 200 (OK) response (P-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK23d244.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=323551024"
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

23. **200 (OK) response (S-CSCF to S-CSCF of UE#2) - see example in table A.4.3.1.1-23**

The S-CSCF forwards the 200 (OK) response to the home network of UE#2 according to the information in the Via field.

Table A.4.3.1.1-23: 200 (OK) response (S-CSCF to S-SCSF of UE#2)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK23d244.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=323551024"; orig-ioi=home1.net;
   term-ioi=home1.net
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

A.4.3.1.2 User getting referred to a conference by a conference participant

Figure A.4.3.1.2-1 shows how UE#2 gets referred to a conference by receiving a REFER request from a conference participant. The REFER request contains the conference URI where UE#2 should use when joining the conference.

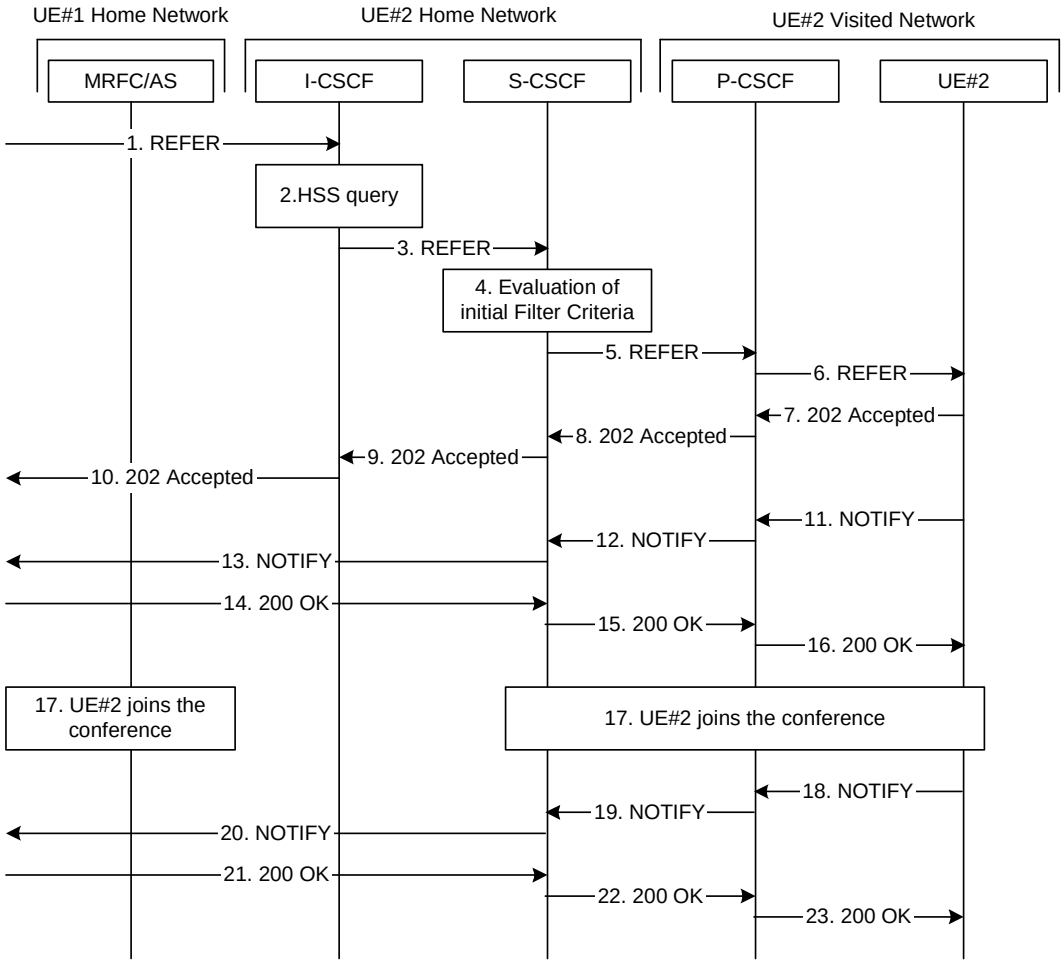

Figure A.4.3.1.2-1: User getting invited to a conference by receiving a REFER request.

The details of the flows are as follows:

1. **REFER request (S-CSCF of UE#1 to I-CSCF) - see example in table A.4.3.1.2-1**

   REFER request is sent by the S-CSCF of UE#1 to UE#2 home network. S-SCSF of UE#1 has resolved the address of I-CSCF as the entry point to UE#2 home network. See subclause 6.3.3.1.1 for originating side of the call flow.

Table A.4.3.1.2-1: REFER request (S-CSCF of UE#1 to I-CSCF)

```
REFER sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+358-50-4821437>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"; orig-ioi=home1.net
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:user2_public1@home2.net>
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 REFER
Refer-To: <sip:conference1@mrfc1.home1.net;method=INVITE>
Referred-By: <sip:user1_public1@home1.net>
Supported: gruu
Contact: <sip:user1_public1@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp>
Content-Length: 0
```

Request-URI: contains the public user identity of UE#2.

Refer-To: contains the conference URI as learned during the conference establishment. Additionally the "method" uri parameter indicates that the other user is requested to send an INVITE request to this conference URI.

Referred-By: contains the public user identity of the referring user, as in this example the referring user has decided to indicate its own identity to the referred user.

2. **The I-CSCF performs HSS query**

   The I-CSCF performs HSS query to find out the S-CSCF serving UE#2.

3. **REFER request (I-CSCF to S-CSCF) - see example in table A.4.3.1.2-3**

   After finding out the S-CSCF assigned to UE#2, the I-CSCF forwards the REFER request to that S-CSCF. The I-CSCF does not add itself to the Record-route since it does not have to remain on the signalling path for subsequent requests within the same dialog.

Table A.4.3.1.2-3: REFER request (I-CSCF to S-CSCF)

```
REFER sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP icscf2.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 67
Record-Route:
Route: <sip:scscf2.home2.net;lr>
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"; orig-ioi=home1.net
Privacy:
From:
To:
Call-ID:
Cseq:
Refer-To:
Referred-By
Supported:
Contact:
Content-Length:

(...)
```

4. **Evaluation of initial Filter Criteria**

   The S-CSCF validates the service profile of this subscriber, and evaluates the initial Filter Criteria.

5. **REFER request (S-CSCF to P-CSCF) - see example in table A.4.3.1.2-5**

   The S-CSCF remembers (from registration procedures) the contact address of UE#2 and determines the P-CSCF assigned for UE#2 and routes the REFER request there.

Table A.4.3.1.2-5: REFER request (S-CSCF to P-CSCF)

```
REFER sip:[5555::eeee:ffff:aaaa:bbbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK234974.3, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 66
Record-Route: <sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>,
   <sip:pcscf1.visited1.net;lr>
Route: <pcscf2.visited2.net;lr>
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"
P-Charging Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
Cseq:
Refer-To:
Referred-By:
Supported:
Contact:
P-Called-Party-ID: <sip:user2_public1@home2.net>
Content-Length:

(...)
```

6. **REFER request (P-CSCF to UE#2) - see example in table A.4.3.1.2-6**

The P-CSCF forwards the request to UE#2.

Table A.4.3.1.2-6: REFER request (P-CSCF to UE#2)

```
REFER sip:[5555::eeee:ffff:aaaa:bbbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK249354.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK234974.3, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 65
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>,
   <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
Cseq:
Refer-To:
Referred-By:
Supported:
Contact:
P-Called-Party-ID:
Content-Length:

(...)
```

7. **202 (Accepted) response (UE#2 to P-CSCF) - see example in table A.4.3.1.2-7**

UE#2 accepts the REFER request by sending a 202 (Accepted) response.

Table A.4.3.1.2-7: 202 (Accepted) response (UE#2 to P-CSCF)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK249354.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK234974.3, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>,
   <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy=none
From:
To: <sip:user2_public1@home2.net>;tag=151170
Call-ID:
CSeq:
Contact: <sip:user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-ad76cc7fc74
   ;comp=sigcomp>
Content-Length:0
```

8. **202 (Accepted) response (P-CSCF to S-CSCF) - see example in table A.4.3.1.2-8**

The P-CSCF forwards the 202 (Accepted) response to the S-CSCF.

Table A.4.3.1.2-8: 202 (Accepted) response (P-CSCF to S-CSCF)

```
SIP/2.0 202 Accepted
Via: scscf2.home2.net;branch=z9hG4bK234974.3, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:pcscf2.visited2.net;lr>, <sip:scscf2.home2.net;lr>,
   <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net
P-Access-Network-Info:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"
Privacy:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:0
```

9. **202 (Accepted) response (S-CSCF to I-CSCF) - see example in table A.4.3.1.2-9**

The S-CSCF forwards the 202 (Accepted) response to the I-CSCF.

Table A.4.3.1.2-9: 202 (Accepted) response (S-CSCF to I-CSCF)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP icscf2.home2.net;branch=z9hG4bK871y12.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>, <tel:+1-212-555-2222>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"; orig-ioi=home2.net
   term-ioi=visited2.net
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Privacy:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:0
```

10. **202 (Accepted) response (I-CSCF to UE#1 home network) - see example in table A.4.3.1.2-10**

The I-CSCF forwards the 202 (Accepted) response to S-CSCF of UE#1.

Table A.4.3.1.2-10: 202 (Accepted) response (I-CSCF to S-CSCF of UE#1)

```
SIP/2.0 202 Accepted
Via: scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"; orig-ioi=home2.net
   term-ioi=visited2.net
Privacy:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:0
```

11. **NOTIFY request (from UE#2 to P-CSCF) - see example in table A.4.3.1.2-11**

UE#2 creates a subscription and sends a notification of the status of the refer event.

Table A.4.3.1.2-11: NOTIFY request (from UE#2 to P-CSCF)

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 70
Route: <sip:pcscf2.home2.net:5088;lr>,<sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>,
   <sip:pcscf1.visited1.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
To: <sip:user1_public1@home1.net>;tag=171828
From: <sip:user2_public1@home2.net>;tag=151170
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 42 NOTIFY
Subscription-State: active;expires:7200
Event: refer
Contact: <sip: user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-ad76cc7fc74
   ;comp=sigcomp>
Content-Length: (…)
Content-Type: message/sipfrag

SIP/2.0 100 (Trying) response
```

12. **NOTIFY request (from P-CSCF to S-CSCF) - see example in table A.4.3.1.2-12**

The P-CSCF forwards the NOTIFY request to the S-CSCF.

Table: A.4.3.1.2-12: NOTIFY request (from P-CSCF to S-CSCF)

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 69
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=223551024"
Route: <sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Access-Network-Info:
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Length: (…)
Content-Type:

(...)
```

13. **NOTIFY request (from S-CSCF to UE#1 home network) - see example in table A.4.3.1.2-13**

The S-CSCF forwards the NOTIFY request to UE#1 home network (S-CSCF#1).

Table A.4.3.1.2-13: NOTIFY request (from S-CSCF to UE#1 home network)

```
NOTIFY sip: user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=223551024"; orig-ioi=home2.net
Max-Forwards: 68
Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Length: (…)
Content-Type:

(...)
```

14. **200 (OK) response (S-CSCF of UE#1 to S-CSCF) - see example in table A.4.3.1.2-14**

The S-CSCF receives a 200 (OK) response to the NOTIFY request from UE#1's home network.

Table A.4.3.1.2-14: 200 (OK) response (S-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=223551024"; orig-ioi=home2.net
   term-ioi=home1.net
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

15. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.4.3.1.2-15**

The S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.4.3.1.2-15: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=223551024"
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

16. **200 (OK) response (P-CSCF to UE#2) - see example in table A.4.3.1.2-16**

The P-CSCF forwards the 200 (OK) response to UE#2.

Table A.4.3.1.2-16: 200 (OK) response (P-CSCF to UE#2)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

17. **UE#2 joins the conference.**

UE#2 joins the conference. The message flows are depicted in subclause 6.3.2.

18. **NOTIFY request (from UE#2 to P-CSCF) - see example in table A.4.3.1.2-18**

P-SCSF receives a NOTIFY request from UE#2 indicating the status of the refer event.

Table A.4.3.1.2-18: NOTIFY request (from UE#2 to P-CSCF)

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 70
Route: <sip:pcscf2.visited2.net:5088;lr>,<sip:scscf2.home2.net;lr>,
   <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
To: <sip:user1_public1@home1.net>; tag=171828
From: <sip:user2_public1@home2.net>;tag=151170
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 43 NOTIFY
Subscription-State: terminated
Event: refer
Content-Length: (…)
Content-Type: message/sipfrag

SIP/2.0 200 OK
```

19. **NOTIFY request (from P-CSCF to S-CSCF) - see example in table A.4.3.1.2-19**

The P-CSCF forwards the NOTIFY request to the S-CSCF.

Table A.4.3.1.2-19: NOTIFY request (from P-CSCF to S-CSCF)

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=323551024"
Max-Forwards: 69
Route: <sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Access-Network-Info:
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Content-Length: (…)
Content-Type:

(...)
```

20. **NOTIFY request (from S-CSCF to S-CSCF of UE#1) - see example in table A.4.3.1.2-20**

The S-CSCF forwards the NOTIFY request to UE#1's home network.

Table A.4.3.1.2-20: NOTIFY request (from S-CSCF to S-CSCF of UE#1)

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK23d244.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=323551024"; orig-ioi=home2.net
Max-Forwards: 68
Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Content-Length: (…)
Content-Type:

(...)
```

21. **200 (OK) response (S-CSCF of UE#1 to S-CSCF) - see example in table A.4.3.1.2-21**

The S-CSCF receives a 200 (OK) response to the NOTIFY request from UE#1 home network.

Table A.4.3.1.2-21: 200 (OK) response (S-CSCF of UE#1 to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK23d244.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=323551024"; orig-ioi=home1.net
   term-ioi=home1.net
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

22. **200 (OK) response (P-CSCF to S-CSCF) - see example in table A.4.3.1.2-22**

The S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.4.3.1.2-22: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=323551024"
From:
To:
Call-ID:
CSeq:
Content-Length:
```

23. **200 (OK) response (P-CSCF to UE#2) - see example in table A.4.3.1.2-23**

The P-CSCF forwards the 200 (OK) response to UE#2.

Table A.4.3.1.2-23: 200 (OK) response (P-CSCF UE#2)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
From:
To:
Call-ID:
CSeq:
Content-Length:
```

A.4.3.1.3 MRFC/AS invites a user to a conference

Figure A.4.3.1.3-1 shows an MRFC/AS inviting a user to a conference. The invitation is sent as a result of user1@home1.net sending a REFER request to the MRFC/AS. The MRFC/AS is located in a different network than user's S-CSCF.

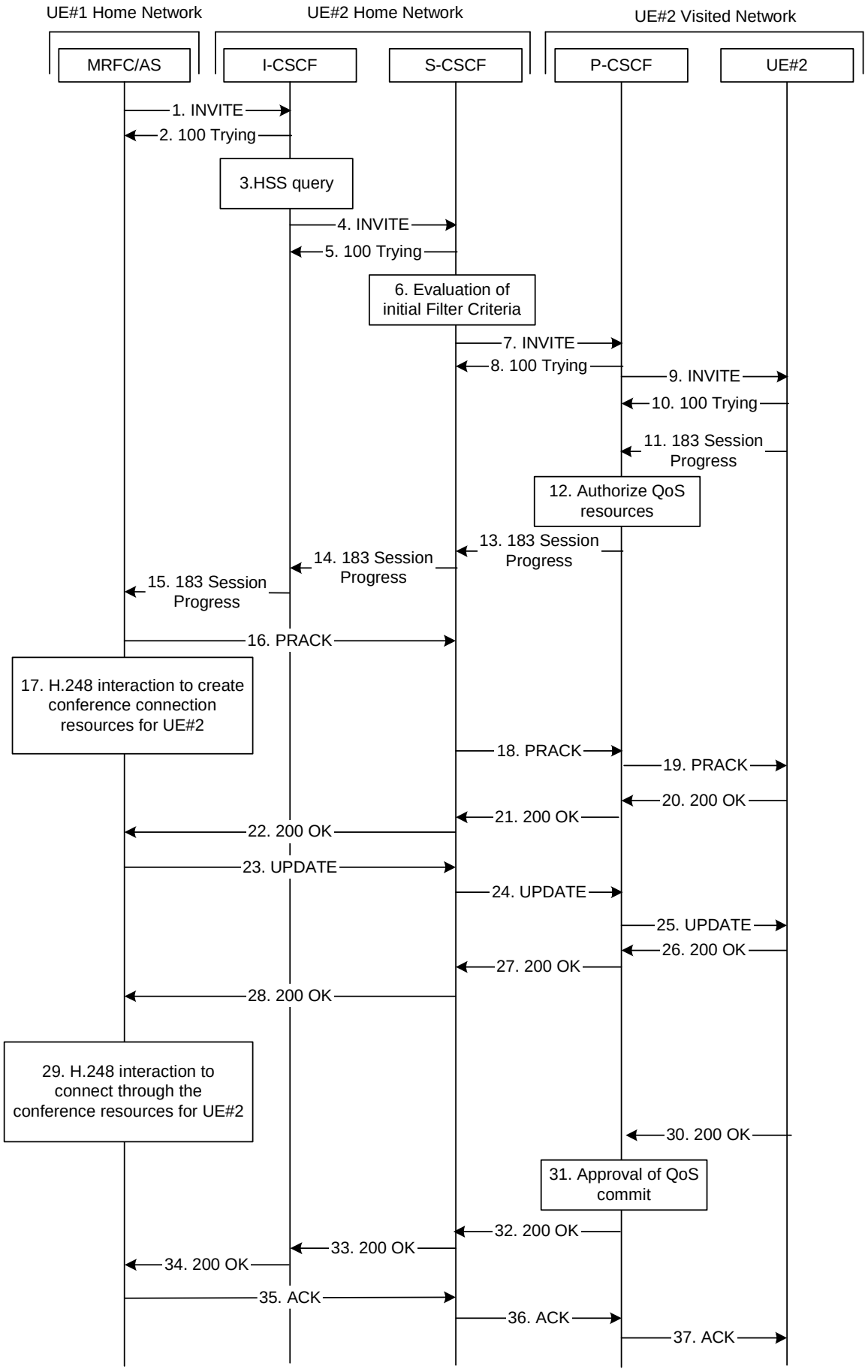

Figure A.4.3.1.3-1: MRFC/AS inviting a user to a conference - MRFC/AS routes directly to I-CSCF

The details of the flows are as follows:

1. **INVITE request (MRFC/AS to I-CSCF) - see example in table A.4.3.1.3-1**

   In this example, the MRFC/AS is capable of resolving the terminating users I-CSCF address for this request. As a result of a DNS query, it has received the address of the I-CSCF as the next hop.

   The MRFC/AS invites a user to a conference as it received a REFER request from another user.

   The MRFC/AS determines the codecs that are applicable for this conference. It builds a SDP Offer containing bandwidth requirements and characteristics of each, and assigns local port numbers for each possible media flow. Multiple media flows may be offered, and for each media flow (m= line in SDP). In this example, there is only one codec per media offered.

   For this example, it is assumed that MRFC/AS is willing to establish a multimedia session comprising a video stream and an audio stream. The video stream supports H.263. The audio stream supports the AMR codec.

   The MRFC/AS indicates that it supports precondition and it indicates that it supports reliable provisional responses. However, it does not use the "Require' header for these capabilities.

   The UE does not have available the resources that are necessary to transport the media.

   For this example it is assumed, that signalling encryption was negotiated between UE and P-CSCF in the security mode set-up procedure during the last successful authentication. This option will only be shown in this example.

Table A.4.3.1.3-1: INVITE request (MRFC/AS to I-CSCF)

```
INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 70
P-Asserted-Identity: <sip:conference1@mrfc1.home1.net>
P-Charging-Vector: ####
Privacy: none
From: <sip:conference1@mrfc1.home1.net>;tag=171828
To: <sip:user2_public1@home2.net>
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 INVITE
Supported: precondition, 100rel
Referred-By: <sip:user1_public1@home1.net>
Contact: <sip:conference1@mrfc1.home1.net>;isfocus
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY, PUBLISH
Allow-Events: conference, pending-additions
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933615 IN IP6 5555::abc:def:abc:abc
s=-
c=IN IP6 5555::abc:def:abc:def
t=0 0
m=video 10001 RTP/AVP 98
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 6544 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

Request-URI: contains the public user identity of UE#2.

P-Asserted-Identity: contains the asserted identity as configured in the MRFC/AS.

Contact: contains the conference URI for the conference allocated at the MRFC/AS and the "isfocus" feature parameter.

Allow-Events: The MRFC/AS indicates support for the "conference" and "pending-additions" event packages

Referred-By: contains the same value as received in the Referred-By in the REFER request that was received from the user that requested the MRFC/AS send the INVITE request.

2. **100 (Trying) response (I-CSCF to MRFC/AS) - see example in table A.4.3.1.3-2**

The I-CSCF responds to the INVITE request with a 100 (Trying) provisional response.

Table A.4.3.1.3-2: 100 (Trying) response (I-CSCF to MRFC/AS)

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP conference1@mrfc1.home1.net;branch=z9hG4bK23273846
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

3. **Cx: User Location Query procedure**

   The I-CSCF sends a query to the HSS to find out the S-CSCF of the called user. The HSS responds with the address of the current S-CSCF for the terminating subscriber.

   For detailed message flows see 3GPP TS 29.228 [12].

4. **INVITE request (I-CSCF to S-CSCF) - see example in table A.4.3.1.3-4**

   The INVITE request is forwarded to the S-CSCF.

Table A.4.3.1.3-4: INVITE request (I-CSCF to S-CSCF)

```
INVITE sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP icscf2.home2.net;branch=z9hG4bK241d17.2, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 69
P-Asserted-Identity:
P-Charging-Vector:
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Referred-By:
Contact:
Allow:
Allow-Events:
Content-Type:
Content-Length: (…)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

5. **100 (Trying) response (S-CSCF to I-CSCF) - see example in table 6.2.2.2-5**

   The S-CSCF responds to the INVITE request (3) with a 100 (Trying) provisional response.

Table 6.2.2.2-5: 100 (Trying) response (S-CSCF to I-CSCF)

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP icscf2.home2.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

6. **Evaluation of initial filter criteria**

   The S-CSCF validates the service profile of this subscriber and evaluates the initial filter criteria.

7. **INVITE request (S-CSCF to P-CSCF) - see example in table A.4.3.1.3-7**

   S-CSCF remembers (from registration procedures) the contact address of UE#2 and determines the P-CSCF assigned for UE#2 and routes message there.

Table A.4.3.1.3-7: INVITE request (S-CSCF to P-CSCF)

```
INVITE sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK241d17.2, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 68
Record-Route: <sip:scscf1.home1.net;lr>
P-Asserted-Identity:
P-Charging-Vector: ####
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Referred-By:
Contact:
Allow:
Allow-Events:
P-Called-Party-ID: <sip:user2_public1@home2.net>
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

8. **100 (Trying) response (P-CSCF to S-CSCF) - see example in table A.4.3.1.3-8**

   The P-CSCF responds to the INVITE request (6) with a 100 (Trying) provisional response.

Table A.4.3.1.3-8: 100 (Trying) response (P-CSCF to S-CSCF)

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK241d17.2, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

9. **INVITE request (P-CSCF to UE#2) - see example in table A.4.3.1.3-9**

P-CSCF forwards the request to UE#2.

Table A.4.3.1.3-9: INVITE request (P-CSCF to UE#2)

```
INVITE sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK240f34.1 SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK241d17.2, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 67
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Referred-By:
Contact:
Allow:
Allow-Events:
P-Called-Party-ID:
Content-Type:
Content-Length: (...)

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
```

10. **100 (Trying) response (UE#2 to P-CSCF) - see example in table A.4.3.1.3-10**

UE#2 responds to the INVITE request (9) with a 100 (Trying) provisional response.

Table A.4.3.1.3-10: 100 (Trying) response (UE#2 to P-CSCF)

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK240f34.1 SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK241d17.2, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

11. **183 (Session Progress) response (UE#2 to P-CSCF) - see example in table A.4.3.1.3-11**

UE#2 determines the complete set of codecs that it is capable of supporting for this session. It determines the intersection with those appearing in the SDP in the INVITE request.

The UE responds with a 183 (Session Progress) response containing SDP back to the originator. This response is sent to the P-CSCF.

Table A.4.3.1.3-11: 183 (Session Progress) response (UE#2 to P-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK241d17.2, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From:
To: <sip:user2_public1@home2.net>; tag=314159
Call-ID:
CSeq:
Require: precondition, 100rel
Contact: <sip:user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-ad76cc7fc74
   ;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
RSeq: 9021
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933623 2987933623 IN IP6 5555::eee:fff:aaa:bbb
s=-
c=IN IP6 5555::eee:fff:aaa:bbb
t=0 0
m=video 3400 RTP/AVP 98
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=inactive
a=conf:qos remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=inactive
a=conf:qos remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

12. **Authorize QoS resources**

    The P-CSCF authorizes the resources necessary for this session. The approval of QoS commitment either happens at this stage or after 200 (OK) response of INVITE request (31) based on operator local policy.

13. **183 (Session Progress) response (P-CSCF to S-CSCF) - see example in table A.4.3.1.3-13**

    The P-CSCF forwards the 183 (Session Progress) response to the S-CSCF.

Table A.4.3.1.3-13: 183 (Session Progress) response (P-CSCF to S-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK241d17.2, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route: <sip:pcscf2.visited2.net;lr>, <sip:scscf2.home2.net;lr>
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>
P-Access-Network-Info:
P-Charging-Vector: ####
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

14. **183 (Session Progress) response (S-CSCF to I-CSCF) - see example in table A.4.3.1.3-14**

The S-CSCF forwards the 183 (Session Progress) response to I-CSCF.

Table A.4.3.1.3-14: 183 (Session Progress) response (S-CSCF to I-CSCF)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP icscf2.home2.net;branch=z9hG4bK241d17.2, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route:
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net>, <tel:+1-212-555-2222>
P-Charging-Vector: ####
P-Charging-Function-Addresses: ####
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

15. **183 (Session Progress) response (I-CSCF to MRFC/AS) - see example in table A.4.3.1.3-15**

The I-CSCF forwards the 183 (Session Progress) response to the MRFC/AS.

Table A.4.3.1.3-15: 183 (Session Progress) response (I-CSCF to MRFC/AS)

```
SIP/2.0 183 Session Progress
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route:
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
CSeq:
Require:
Contact:
Allow:
RSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
a=
a=
```

16. PRACK request (MRFC/AS to S-CSCF) - see example in table A.4.3.1.3-16

The MRFC/AS determines which media flows should be used for this session, and which codecs should be used for each of those media flows.

Since there is no change in the media characteristics, the MRFC/AS does not include any new SDP offer in the PRACK request sent to UE#2.

The MRFC/AS sends the PRACK request to the S-CSCF of UE#2 according to the Record-Route header received in 183 Session progress (15).

Table A.4.3.1.3-16: PRACK request (MRFC/AS to S-CSCF)

```
PRACK sip:user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-ad76cc7fc74
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 70
Route: <sip:scscf2.home2.net;lr>, <sip:pcscf2.visited2.net;lr>
From: <sip:conference1@mrfc1.home1.net>; tag=171828
To: <sip:user2_public1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 128 PRACK
RAck: 9021 127 INVITE
Content-Length: 0
```

Request-URI: takes the value of the Contact header of the received 183 (Session Progress) response.

17. **Resource reservation**

After determining the media streams, the MRFC/AS initiates the reservation procedures for the resources needed for this session.

18. **PRACK request (S-CSCF to P-CSCF) - see example in table A.4.3.1.3-18**

The P-CSCF forwards the PRACK request to the P-CSCF.

Table A.4.3.1.3-18: PRACK request (S-CSCF to P-CSCF)

```
PRACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 69
Route: <sip:pcscf2.visited2.net;lr>
From:
To:
Call-ID:
Cseq:
RAck:
Content-Length:
```

19. **PRACK request (P-CSCF to UE#2) - see example in table A.4.3.1.3-19**

The P-CSCF forwards the PRACK request to UE#2.

Table A.4.3.1.3-19: PRACK request (P-CSCF to UE#2)

```
PRACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
RAck:
Content-Length:
```

20. **200 (OK) response (UE#2 to P-CSCF) - see example in table A.4.3.1.3-20 (related to table A.4.3.1.3-19)**

UE#2 acknowledges the PRACK request (19) with a 200 (OK) response.

Table A.4.3.1.3-20: 200 (OK) response (UE#2 to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

21. **200 (OK) response (P-CSCF to S-CSCF) - see example in table A.4.3.1.3-21**

The P-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.4.3.1.3-21: 200 (OK) response (P-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:
```

22. **200 (OK) response (S-CSCF to MRFC/AS) - see example in table A.4.3.1.3-22**

The S-CSCF forwards the 200 (OK) response to the MRFC/AS.

Table A.4.3.1.3-22: 200 (OK) response (S-CSCF to MRFC/AS)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK23273846
P-Access-Network-Info:
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:
```

23. **UPDATE request (MRFC/AS to S-CSCF) - see example in table A.4.3.1.3-23**

When the resource reservation in step (17) is completed, the MRFC/AS sends the UPDATE request to UE#2.

Table A.4.3.1.3-23: UPDATE request (MRFC/AS to S-CSCF)

```
UPDATE sip:user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-ad76cc7fc74
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 70
Route: <sip:scscf2.home2.net;lr>, <sip:pcscf2.visited2.net;lr>
From: <sip:conference1@mrfc1.home1.net>; tag=171828
To: <sip:user2_public1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 129 UPDATE
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933617 IN IP6 5555::abc:def:abc:abc
s=-
c=IN IP6 5555::abc:def:abc:def
t=0 0
m=video 0 RTP/AVP 98
b=AS:75
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

Request-URI: takes the value of the Contact header of the received 183 (Session Progress) response.

24. **UPDATE request (S-CSCF to P-CSCF) - see example in table A.4.3.1.3-24**

The S-CSCF forwards the UPDATE request to the P-CSCF.

Table A.4.3.1.3-24: UPDATE request (S-CSCF to P-CSCF)

```
UPDATE sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 69
Route: <sip:pcscf2.visited2.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
m=
m=
b=
a=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

25. **UPDATE request (P-CSCF to UE#2) - see example in table A.4.3.1.3-25**

The P-CSCF forwards the UPDATE request to UE#2.

Table A.4.3.1.3-25: UPDATE request (P-CSCF to UE#2)

```
UPDATE sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
m=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

26. **200 (OK) response (UE#2 to P-CSCF) - see example in table A.4.3.1.3-26 (related to table A.4.3.1.3-25)**

UE#2 acknowledges the UPDATE request (25) with a 200 (OK) response.

Table A.4.3.1.3-26: 200 (OK) response (UE#2 to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From:
To:
Call-ID:
CSeq:
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933623 2987933625 IN IP6 5555:: aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=video 0 RTP/AVPF 98
b=AS:75
a=curr:qos local sendrecv
a=curr:qos remote sendrecv
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 6544 RTP/AVPF 97 96
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote sendrecv
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

27. **200 (OK) response (P-CSCF to S-CSCF) - see example in table A.4.3.1.3-27**

The P-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.4.3.1.3-27: 200 (OK) response (P-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
P-Access-Network-Info:
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

28. **200 (OK) response (S-CSCF to MRFC/AS) - see example in table A.4.3.1.3-28**

The S-CSCF forwards the 200 (OK) response to the MRFC/AS.

Table A.4.3.1.3-28: 200 (OK) response (S-CSCF to MRFC/AS)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK23273846
From:
To:
Call-ID:
CSeq:
Content-Type:
Content-Length:

v=
o=
s=
c=
t=
m=
b=
a=
a=
a=
a=
a=
a=
m=
b=
a=
a=
a=
a=
a=
a=
a=
```

29. **H.248 interaction to modify connection**

MRFC initiates a H.248 interaction to connect through the multimedia processing resources for UE#2 in MRFP.

30. **200 (OK) response (UE#2 to P-CSCF) - see example in table A.4.3.1.3-30 (related to table A.4.3.1.3-9)**

UE#2 sends a 200 (OK) response final response to the INVITE request (9) to the P-CSCF.

Table 6.2.2.2-30: 200 (OK) response (UE#2 to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK240f34.1 SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK241d17.2, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From:
To:
Call-ID:
CSeq: 127 INVITE
Contact: <sip:user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-ad76cc7fc74
   ;comp=sigcomp>
Content-Length:0
```

31. **Approval of QoS commit**

The P-CSCF approves the commitment of the QoS resources if it was not approved already in step (12).

32. **200 (OK) response (P-CSCF to S-CSCF) - see example in table A.4.3.1.3-32**

The P-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.4.3.1.3-32: 200 (OK) response (P-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK241d17.2, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route: <sip:pcscf2.visited2.net;lr>, <sip:scscf2.home2.net;lr>
P-Access-Network-Info:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:0
```

33. **200 (OK) response (S-CSCF to I-CSCF) - see example in table A.4.3.1.3-33**

The S-CSCF sends a 200 (OK) response final response along the signalling path back to I-CSCF.

Table A.4.3.1.3-33: 200 (OK) response (S-CSCF to I-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP icscf2.home2.net;branch=z9hG4bK241d17.2, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:
```

34. **200 (OK) response (I-CSCF to MRFC/AS) - see example in table A.4.3.1.3-34**

The I-CSCF forwards the 200 (OK) response final response to the session originator.

Table 6.2.2.2-34: 200 (OK) response (I-CSCF to MRFC/AS)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:
```

35. **ACK request (MRFC/AS to S-CSCF) - see example in table A.4.3.1.3-35**

The MRFC/AS responds to the 200 (OK) response (35) with an ACK request sent to the S-CSCF.

Table A.4.3.1.3-35: ACK request (MRFC/AS to S-CSCF)

```
ACK sip: user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-ad76cc7fc74
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 70
Route: <sip:scscf2.home2.net;lr>, <sip:pcscf2.visited2.net;lr>
From: <sip:conference1@mrfc1.home1.net>; tag=171828
To: <sip:user2_public1@home2.net>;tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 ACK
Content-Length: 0
```

36. **ACK request (S-CSCF to P-CSCF) - see example in table A.4.3.1.3-36**

The S-CSCF forwards the ACK request to the P-CSCF.

Table A.4.3.1.3-36: ACK request (S-CSCF to P-CSCF)

```
ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 69
Route: <sip:pcscf2.visited2.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:
```

37. **ACK request (P-CSCF to UE#2) - see example in table A.4.3.1.3-37**

The P-CSCF forwards the ACK request to the UE#2.

Table A.4.3.1.3-37: ACK request (P-CSCF to UE#2)

```
ACK sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:
```

A.4.3.1.4 MRFC/AS refers a user to a conference

Figure A.4.3.1.4-1 shows how MRFC/AS refers UE#2 to a conference by sending a REFER request to UE#2.The MRFC/AS has created a conference and allocated a conference URI.

In this example, the MRFC/AS is not capable of resolving the Request-URI and therefore routes the request first to the S-CSCF in its own network.

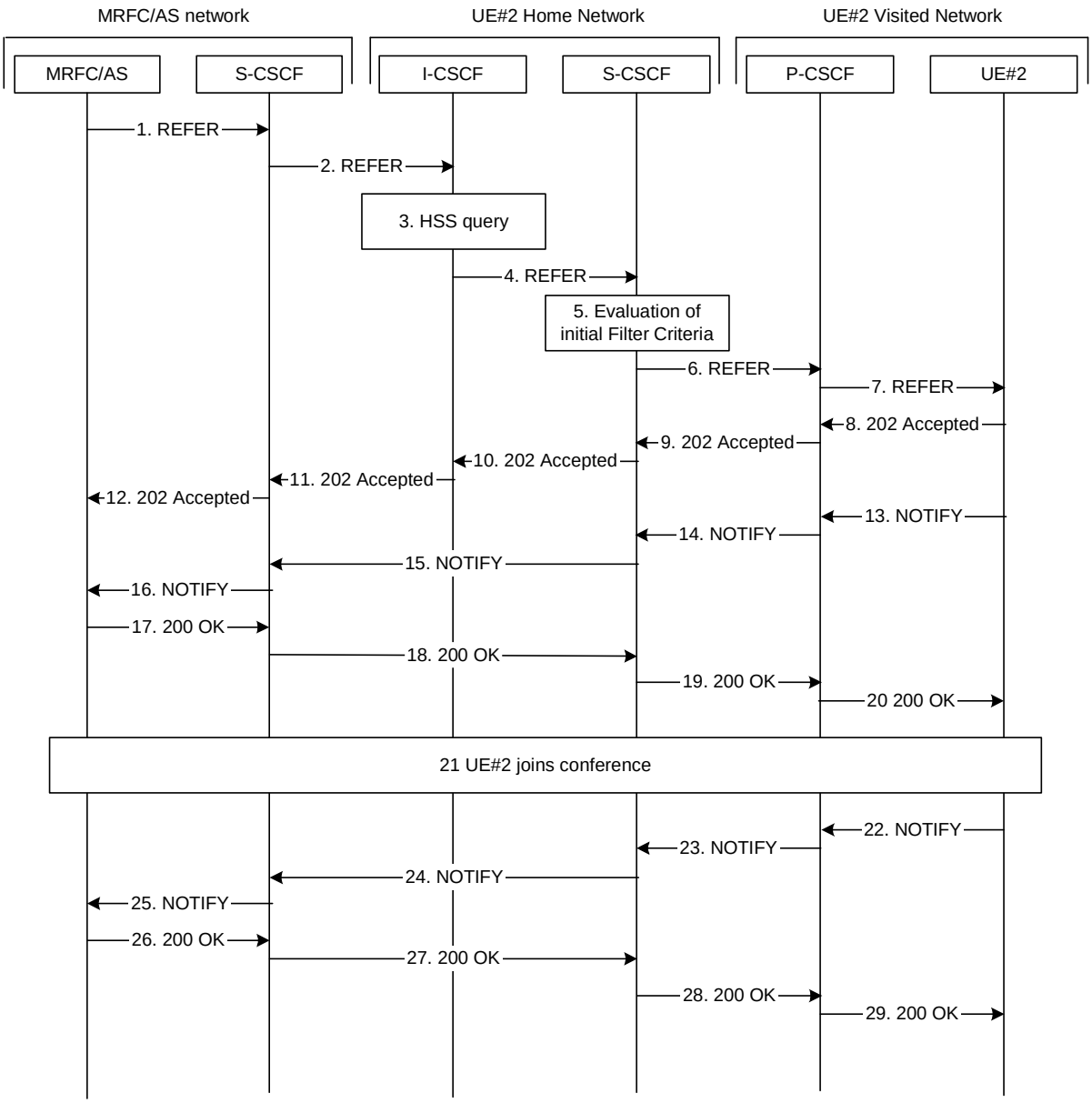

Figure A.4.3.1.4-1: MRFC/AS inviting another user to a conference by sending a REFER request to UE#2

The details of the flows are as follows:

1. **REFER request (MRFC/AS to S-CSCF) - see example in table A.4.3.1.4-1**

   The MRFC/AS wants to invite another user to a conference by sending a REFER request to that user.

Table A.4.3.1.4-1: REFER request (MRFC/AS to S-CSCF)

```
REFER sip: user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 70
Route: <sip:scscf1.home1.net;lr>
P-Asserted-Identity: <sip:conference1@mrfc1.home1.net>
P-Charging-Vector: ####
Privacy: none
From: <sip:conference1@mrfc1.home1.net>; tag=171828
To: <sip:user2_public1@home2.net>
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 REFER
Refer-To: <conference1@mrfc1.home1.net;method=INVITE>
Referred-By: <sip:user1_public1@home1.net>
Contact: <sip:conference1@mrfc1.home1.net>;isfocus
Content-Length: 0
```

Request-URI: contains the public user identity of UE#2.

P-Asserted-Identity: contains the asserted identity as configured in the MRFC/AS.

P-Charging-Vector: the MRFC/AS inserts this header and populates the icid parameters with a globally unique value and includes the originating network identifier.

Refer-To: contains the conference URI. Additionally the method uri parameter indicates that the UE#2 shall send an INVITE request to this URI.

Referred-By: contains the public user identity of the user, on which behalf the MRFC/AS sends the REFER message.

Contact: contains the conference URI for the conference allocated at the MRFC/AS and the "isfocus" feature parameter.

2. **REFER request (S-CSCF to I-CSCF) - see example in table A.4.3.1.4-2**

   The REFER request is forwarded to the I-CSCF.

Table A.4.3.1.4-2: REFER request (S-CSCF to I-CSCF)

```
REFER sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 69
Record-Route: <sip:scscf1.home1.net;lr>
P-Asserted-Identity: <sip:conference1@mrfc1.home1.net>
P-Charging-Vector:
Privacy:
From:
To:
Call-ID:
Cseq:
Refer-To:
Referred-By:
Contact:
Content-Length:
```

3. **Cx: User Location Query procedure**

   The I-CSCF sends a query to the HSS to find out the S-CSCF of the called user. The HSS responds with the address of the current S-CSCF for the terminating subscriber.

   For detailed message flows see 3GPP TS 29.228 [12]

4. **REFER request (I-CSCF to S-CSCF) - see example in table A.4.3.1.4-4**

   The I-CSCF forwards the REFER request to the address obtained during HSS query. The I-CSCF adds itself to the Via, but not to the Record-Route header as it will not need to stay on the signalling path for subsequent requests.

Table A.4.3.1.4-4: REFER request (I-CSCF to S-CSCF)

```
REFER sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP icscf2.home2.net;branch=z9hG4bK231234.5, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 68
Record-Route: <sip:scscf1.home1.net;lr>
P-Asserted-Identity:
P-Charging-Vector:
Privacy:
From:
To:
Call-ID:
Cseq:
Refer-To:
Referred-By:
Contact:
Content-Length:
```

5. **Evaluation of Initial Filter criteria**

   S-CSCF validates the service profile of this subscriber and evaluates the initial filter criteria.

6. **REFER request (S-CSCF to P-CSCF) - see example in table A.4.3.1.4-6**

   The S-CSCF remembers (from registration procedures) the contact address of UE#2 and determines the P-CSCF assigned for UE#2 and routes the message there. The S-CSCF adds itself to the Via and Record-Route headers.

Table A.4.3.1.4-6: REFER request (S-CSCF to P-CSCF)

```
REFER sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK234974.3, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK231234.5, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 67
Record-Route: <sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>
P-Asserted-Identity:
P-Charging-Vector: ####
Privacy:
From:
To:
Call-ID:
Cseq:
Refer-To:
Referred-By:
Contact:
P-Called-Party-ID: <sip:user2_public1@home2.net>
Content-Length:
```

7. **REFER request (P-CSCF to UE#2) - see example in table A.4.3.1.4-7**

The P-CSCF forwards the request to UE#2.

Table A.4.3.1.4-7: REFER request (P-CSCF to UE#2)

```
REFER sip:[5555::eee:fff:aaa:bbb]:8805;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK249354.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK234974.3, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK231234.5, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 66
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>,
   <sip:scscf1.home1.net;lr>
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
Cseq:
Refer-To:
Referred-By:
Contact:
P-Called-Party-ID:
Content-Length:
```

8. **202 (Accepted) response (UE#2 to P-CSCF) - see example in table A.4.3.1.4-8**

UE# accepts the REFER request by sending a 202 (Accepted) response.

Table A.4.3.1.4-8: 202 (Accepted) response (UE#2 to P-CSCF)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP pcscf2.visited2.net:5088;comp=sigcomp;branch=z9hG4bK249354.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK234974.3, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK231234.5, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route: <sip:pcscf2.visited2.net:5088;lr;comp=sigcomp>, <sip:scscf2.home2.net;lr>,
   <sip:scscf1.home1.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy:none
From: <sip:conference1@mrfc1.home1.net>; tag=171828
To: <sip:user2_public1@home2.net>;tag=151170
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 127 REFER
Contact: <sip:user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-ad76cc7fc74
   ;comp=sigcomp>
Content-Length:0
```

9. **202 (Accepted) response (P-CSCF to S-CSCF) - see example in table A.4.3.1.4-9**

The P-CSCF forwards the response to the S-CSCF.

Table A.4.3.1.4-9: 202 (Accepted) response (P-CSCF to S-CSCF)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK234974.3, SIP/2.0/UDP
   icscf2.home2.net;branch=z9hG4bK231234.5, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route: <sip:pcscf2.visited2.net;lr>, <sip:scscf2.home2.net;lr>,
   <sip:scscf1.home1.net;lr>
P-Access-Network-Info:
P-Asserted-Identity: <sip:user2_public1@home2.net>
P-Charging-Vector: ####
Privacy:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:
```

10. **202 (Accepted) response (S-CSCF to I-CSCF) - see example in table A.4.3.1.4-10**

The S-CSCF forwards the response to the I-CSCF.

Table A.4.3.1.4-10: 202 (Accepted) response (S-CSCF to I-CSCF)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP icscf2.home2.net;branch=z9hG4bK231234.5, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route:
P-Asserted-Identity: "John Smith" <sip:user2_public1@home2.net; <tel:+1-212-555-2222>
P-Charging-Vector: ####
P-Charging-Function-Addresses: ####
Privacy:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:
```

11. **202 (Accepted) response (I-CSCF to S-CSCF) - see example in table A.4.3.1.4-11**

The I-CSCF forwards the response to the S-CSCF.

Table A.4.3.1.4-11: 202 (Accepted) response (I-CSCF to S-CSCF)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route:
P-Asserted-Identity:
P-Charging-Vector:
Privacy:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:
```

12. **202 (Accepted) response (S-CSCF to MRFC/AS) - see example in table A.4.3.1.4-12**

The S-CSCF forwards the response to the MRFC/AS.

Table A.4.3.1.4-12: 202 (Accepted) response (S-CSCF to MRFC/AS)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK23273846
Record-Route:
P-Asserted-Identity:
P-Charging-Vector:
Privacy:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:
```

13. **NOTIFY request (UE#2 to P-CSCF) - see example in table A.4.3.1.4-13**

According to RFC 3515 [17], UE#2 creates a subscription and sends a notification of the status of the refer.

Table A.4.3.1.4-13: NOTIFY request (from UE#2 to P-CSCF)

```
NOTIFY sip:conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 70
Route: <sip:pcscf2.visited2.net:5088;lr>, <sip:scscf2.home2.net;lr>,
   <sip:scscf1.home1.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
To: <sip:conference1@mrfc1.home1.net >;tag=171828
From: <sip:user2_public1@home2.net>;tag=151170
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 42 NOTIFY
Subscription-State: active;expires:7200
Event: refer
Contact: <sip:user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-ad76cc7fc74
   ;comp=sigcomp>
Content-Length: (…)
Content-Type: message/sipfrag

SIP/2.0 100 Trying
```

14. **NOTIFY request (from P-CSCF to S-CSCF) - see example in table A.4.3.1.4-14**

The P-CSCF forwards the message to the S-CSCF.

Table: A.4.3.1.4-14: NOTIFY request (from P-CSCF to S-CSCF)

```
NOTIFY sip:conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 69
Route: <sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>
P-Access-Network-Info:
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Length: (…)
Content-Type:

(...)
```

15. **NOTIFY request (from S-CSCF to S-CSCF - see example in table A.4.3.1.4-15**

The S-CSCF forwards the message to the S-CSCF.

Table A.4.3.1.4-15: NOTIFY request (from S-CSCF to S-CSCF)

```
NOTIFY sip:conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 68
Route: <sip:scscf1.home1.net;lr>
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Length: (…)
Content-Type:

(...)
```

16. **NOTIFY request (from S-CSCF to MRFC/AS- see example in table A.4.3.1.4-16**

The S-CSCF forwards the message to the MRFC/AS.

Table A.4.3.1.4-16: NOTIFY request (from S-CSCF to MRFC/AS)

```
NOTIFY sip:conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 67
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Length: (…)
Content-Type:

(...)
```

17. **200 (OK) response (MRFC/AS to S-CSCF) - see example in table A.4.3.1.4-17**

The MRFC/AS acknowledges the NOTIFY request with a 200 (OK) response to the S-CSCF.

Table A.4.3.1.4-17: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

18. **200 (OK) response (S-CSCF to S-CSCF) - see example in table A.4.3.1.4-18**

The S-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.4.3.1.4-18: 200 (OK) response (S-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
From:
To:
Call-ID:
CSeq:
Content-Length:
```

19. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.4.3.1.4-19**

The S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.4.3.1.4-19: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
From:
To:
Call-ID:
CSeq:
Content-Length:
```

20. **200 (OK) response (P-CSCF to UE#2) - see example in table A.4.3.1.4-20**

The P-CSCF forwards the 200 (OK) response to UE#2.

Table A.4.3.1.4-20: 200 (OK) response (P-CSCF to UE#2)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
From:
To:
Call-ID:
CSeq:
Content-Length:
```

21. **UE#2 joins the conference.**

UE#2 joins the conference as described in subclause 5.3.1.4.

22. **NOTIFY request (UE#2 to P-CSCF) - see example in table A.4.3.1.4-22**

The P-CSCF receives a NOTIFY request from UE#2 indicating the status of the refer.

Table A.4.3.1.4-22: NOTIFY request (from UE#2 to P-CSCF)

```
NOTIFY sip:conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 70
Route: <sip:pcscf2.visited2.net:5088;lr>, <sip:scscf2.home2.net;lr>,
   <sip:scscf1.home1.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
To: <sip:conference1@mrfc1.home1.net >;tag=171828
From: <sip:user2_public1@home2.net>;tag=151170
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 42 NOTIFY
Subscription-State: terminated
Event: refer
Content-Length: (…)
Content-Type: message/sipfrag

SIP/2.0 200 OK
```

23. **NOTIFY request (from P-CSCF to S-CSCF) - see example in table A.4.3.1.4-23**

The P-CSCF forwards the message to the S-CSCF.

Table: A.4.3.1.4-23: NOTIFY request (from P-CSCF to S-CSCF)

```
NOTIFY sip:conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 69
P-Access-Network-Info:
Route: <sip:scscf2.home2.net;lr>, <sip:scscf1.home1.net;lr>
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Content-Length: (…)
Content-Type:

(...)
```

24. **NOTIFY request (from S-CSCF to S-CSCF - see example in table A.4.3.1.4-24**

The S-CSCF forwards the message to the S-CSCF.

Table A.4.3.1.4-24: NOTIFY request (from S-CSCF to S-CSCF)

```
NOTIFY sip:conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 68
Route: <sip:scscf1.home1.net;lr>
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Content-Length: (…)
Content-Type:

(...)
```

25. **NOTIFY request (from S-CSCF to MRFC/AS- see example in table A.4.3.1.4-25**

The S-CSCF forwards the message to the MRFC/AS.

Table A.4.3.1.4-25: NOTIFY request (from S-CSCF to MRFC/AS)

```
NOTIFY sip:conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
Max-Forwards: 67
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Content-Length: (…)
Content-Type:

(...)
```

26. **200 (OK) response (MRFC/AS to S-CSCF) - see example in table A.4.3.1.4-26**

The MRFC/AS acknowledges the NOTIFY request with a 200 (OK) response to the S-CSCF.

Table A.4.3.1.4-26: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

27. **200 (OK) response (S-CSCF to S-CSCF) - see example in table A.4.3.1.4-27**

The S-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.4.3.1.4-27: 200 (OK) response (S-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf2.home2.net;branch=z9hG4bK764z87.1, SIP/2.0/UDP
   pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
From:
To:
Call-ID:
CSeq:
Content-Length:
```

28. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.4.3.1.4-28**

The S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.4.3.1.4-28: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net;branch=z9hG4bK234223.1, SIP/2.0/UDP
   [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
From:
To:
Call-ID:
CSeq:
Content-Length:
```

29. **200 (OK) response (P-CSCF to UE#2) - see example in table A.4.3.1.4-29**

The P-CSCF forwards the 200 (OK) response to UE#2.

Table A.4.3.1.4-29: 200 (OK) response (P-CSCF to UE#2)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::eee:fff:aaa:bbb]:8805;comp=sigcomp;branch=z9hG4bK23dh42.1
From:
To:
Call-ID:
CSeq:
Content-Length:
```

A.4.4 User requesting IMS to join another user

A.4.4.1 MRFC/AS is located in user's home network

Figure A.4.4.1-1 shows how UE#1 invites UE#2 to a conference by sending a REFER request to MRFC/AS. UE#1 has created a conference by using the mechanisms described in subclause 5.3.1.3, and UE#1 has learned the conference URI that identifies this conference.

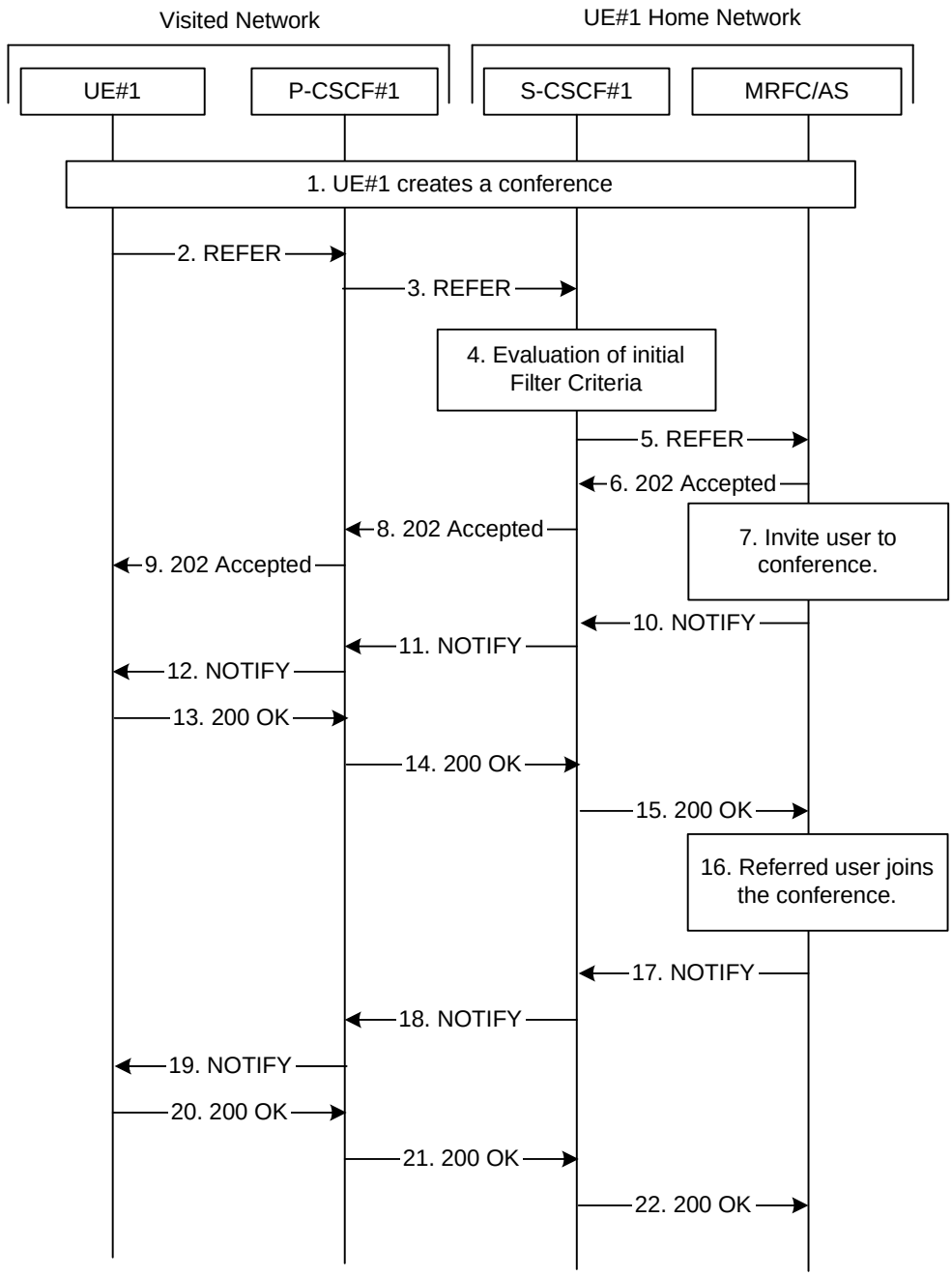

Figure A.4.4.1-1: User inviting another user to a conference by sending a REFER request to MRFC/AS

The details of the flows are as follows:

1. **UE#1 creates a conference**

   UE#1 creates a conference as described in subclause 5.3.1.3. Once the conference creation is accomplished, UE#1 has learned the conference URI allocated for this conference.

2. **REFER request (UE to P-CSCF) - see example in table A.4.4.1-2**

A UE has created a conference and learned the conference URI. Now the UE wants to join another UE to that conference.

Table A.4.4.1-2: REFER request (UE to P-CSCF)

```
REFER sip: conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip: conference1@mrfc1.home1.net>
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 REFER
Require: sec-agree
Refer-To: <sip:user2_public1@home2.net;method=INVITE>
Proxy-Require: sec-agree
Supported: gruu
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Contact: <sip:user1_public1@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp>
Content-Length: 0
```

Request-URI: contains the conference URI as learned during the conference establishment.

3. **REFER request (P-CSCF to S-CSCF) - see example in table A.4.4.1-3**

The REFER request is forwarded to the S-CSCF.

Table A.4.4.1-3: REFER request (P-CSCF to S-CSCF)

```
REFER sip: conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:orig@scscf1.home1.net;lr>
Record-Route: <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Charging-Vector: ####
P-Access-Network-Info:
Privacy:
From:
To:
Call-ID:
Cseq:
Refer-To:
Supported:
Contact:
Content-Length:
```

4. **Evaluation of initial Filter Criteria**

The S-CSCF validates the service profile of this subscriber and evaluates the initial filter criteria.

5. **REFER request (S-CSCF to MRFC/AS) - see example in table A.4.4.1-5**

   The S-CSCF forwards the REFER request to the address obtained by a DNS query. The S-CSCF adds itself to the Record-Route header.

Table A.4.4.1-5: REFER request (S-CSCF to MRFC/AS)

```
REFER sip:user2_public1@home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 68
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>, <tel:+358-50-4821437>
P-Charging-Vector:  ####
Privacy:
From:
To:
Call-ID:
Cseq:
Refer-To:
Supported:
Contact:
Content-Length:
```

6. **202 (Accepted) response (MRFC/AS to S-CSCF) - see example in table A.4.4.1-6**

   The MRFC/AS indicates that it has received the REFER request by sending a 202 (Accepted) response. This means that MRFC/AS has accepted the REFER request and has begun to process the request. This does not mean, however, that the referred-to resource would have been contacted.

Table A.4.4.1-6: 202 (Accepted) response (MRFC/AS to S-CSCF)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
P-Asserted-Identity: <conference1@mrfc1.home1.net>
P-Charging-Vector: ####
Privacy:none
From: <sip:user1_public1@home1.net>;tag=171828
To: <sip:conference1@mrfc1.home1.net>;tag=151170
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 127 REFER
Contact: <sip:conference1@mrfc1.home1.net>;isfocus
Content-Length:0
```

Contact: contains the conference URI for the conference allocated at the MRFC/AS and the "isfocus" feature parameter.

7. **INVITE request user to conference**

   The MRFC/AS invites the user, who is indicated in the Refer-To header of the received REFER request. It does apply the procedures as shown in subclause A.4.3.1.3.

8. **202 (Accepted) response (S-CSCF to P-CSCF) - see example in table A.4.4.1-8**

The S-CSCF forwards the response to the P-CSCF.

Table A.4.4.1-8: 202 (Accepted) response (S-CSCF to P-CSCF)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
P-Charging-Vector: ####
Privacy:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:
```

9. **202 (Accepted) response (P-CSCF to UE#1) - see example in table A.4.4.1-9**

The P-CSCF forwards the response to UE#1.

Table A.4.4.1-9: 202 (Accepted) response (P-CSCF to UE#1)

```
SIP/2.0 202 Accepted
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Asserted-Identity:
Privacy:
From:
To:
Call-ID:
CSeq:
Contact:
Content-Length:
```

10. **NOTIFY request (MRFC/AS to S-CSCF) - see example in table A.4.4.1-10**

The MRFC/AS sends a NOTIFY request to inform the S-CSCF about the progress of the REFER request processing. The body of the NOTIFY request contains a fragment of the response as received by the notifying UE for the request that was initiated due to the REFER request.

Table A.4.4.1-10: NOTIFY request (from MRFC/AS to S-CSCF)

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP mrfc.home1.net;branch=z9hG4bK23273846
Max-Forwards: 70
Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
To: <sip:user1_public1@home1.net>;tag=171828
From: <sip:conference1@mrfc1.home1.net>;tag=151170
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 42 NOTIFY
Subscription-State: active;expires:7200
Event: refer
Contact: <sip:conference1@mrfc1.home1.net>;isfocus
Content-Length: (…)
Content-Type: message/sipfrag

SIP/2.0 100 Trying
```

11. **NOTIFY request (from S-CSCF to P-CSCF) - see example in table A.4.4.1-11**

The S-CSCF forwards the message to the P-CSCF.

Table: A.4.4.1-11: NOTIFY request (from S-CSCF to P-CSCF)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   mrfc.home1.net;branch= z9hG4bK23273846
Max-Forwards: 69
Route: <sip:pcscf1.visited1.net;lr>
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Length: (…)
Content-Type:

(...)
```

12. **NOTIFY request (from P-CSCF to UE#1) - see example in table A.4.4.1-12**

The P-CSCF forwards the message to UE#1.

Table A.4.4.1-12: NOTIFY request (from P-CSCF to UE#1)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net:7531;comp=sigcomp;branch=z9hG4bK23433.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   mrfc.home1.net;branch=z9hG4bK23273846
Max-Forwards: 68
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Length: (…)
Content-Type:

(...)
```

13. **200 (OK) response (UE to P-CSCF) - see example in table A.4.4.1-13**

The UE acknowledges the NOTIFY request with a 200 (OK) response to the P-CSCF.

Table A.4.4.1-13: 200 (OK) response (UE to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net:7531;comp=sigcomp;branch=z9hG4bK23433.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP mrfc.home1.net;branch=z9hG4bK23273846
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

14. **200 (OK) response (P-CSCF to S-CSCF) - see example in table A.4.4.1-14**

The P-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.4.4.1-14: 200 (OK) response (P-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   mrfc.home1.net;branch=z9hG4bK23273846
P-Access-Network-Info:
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

15. **200 (OK) response (S-CSCF to MRFC/AS) - see example in table A.4.4.1-15**

The S-CSCF forwards the 200 (OK) response to MRFC/AS.

Table A.4.4.1-15: 200 (OK) response (S-CSCF to MRFC/AS)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP mrfc.home1.net;branch=z9hG4bK23273846
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

16. **Referred user joins the conference.**

The referred user joins the conference as described in subclause 5.3.1.4.

17. **NOTIFY request (from MRFC/AS to S-CSCF) - see example in table A.4.4.1-17**

The MRFC/AS sends a NOTIFY request that indicates that the referred party has joined the conference.

Table A.4.4.1-17: NOTIFY request (from MRFC/AS to S-CSCF)

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP mrfc.home1.net;branch= z9hG4bK23273846
Max-Forwards: 70
Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
To: <sip:user1_public1@home1.net>; tag=171828
From: <sip:conference1@mrfc1.home1.net>;tag=151170
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 43 NOTIFY
Subscription-State: terminated
Event: refer
Content-Length: (…)
Content-Type: message/sipfrag

SIP/2.0 200 OK
```

Subscription-State: indicates that the implicit subscription to the refer event has been terminated.

18. **NOTIFY request (from S-CSCF to P-CSCF) - see example in table A.4.4.1-18**

The S-CSCF forwards the message to the P-CSCF.

Table 6.3.3.1.1-18: NOTIFY request (from S-CSCF to P-CSCF)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   mrfc.home1.net;branch= z9hG4bK23273846
Max-Forwards: 69
Route: <sip:pcscf1.visited1.net;lr>
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Content-Length: (…)
Content-Type:

(...)
```

19. **NOTIFY request (from P-CSCF to UE#1) - see example in table A.4.4.1-19**

The P-CSCF forwards the message to UE#1.

Table A.4.4.1-19: NOTIFY request (from P-CSCF to UE#1)

```
NOTIFY sip: [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net:7531;comp=sigcomp;branch=z9hG4bK23433.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   mrfc.home1.net;branch=z9hG4bK23273846
Max-Forwards: 68
To:
From:
Call-ID:
CSeq:
Subscription-State:
Event:
Content-Length: (…)
Content-Type:

(...)
```

20. **200 (OK) response (UE to P-CSCF) - see example in table A.4.4.1-20**

The UE acknowledges the NOTIFY request with a 200 (OK) response to the P-CSCF.

Table A.4.4.1-20: 200 (OK) response (UE to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net:7531;comp=sigcomp;branch=z9hG4bK23433.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP mrfc.home1.net;branch=z9hG4bK23273846
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

21. **200 (OK) response (P-CSCF to S-CSCF) - see example in table A.4.4.1-21**

The P-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.4.4.1-21: 200 (OK) response (P-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK23436s.1, SIP/2.0/UDP
   mrfc.home1.net;branch=z9hG4bK23273846
P-Access-Network-Info:
From:
To:
Call-ID:
CSeq:
Content-Length:
```

22. **200 (OK) response (S-CSCF to MRFC/AS) - see example in table A.4.4.1-22**

The S-CSCF forwards the 200 (OK) response to the MRFC/AS.

Table A.4.4.1-22: 200 (OK) response (S-CSCF to MRFC/AS)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP mrfc.home1.net;branch=z9hG4bK23273846
From:
To:
Call-ID:
CSeq:
Content-Length:
```

A.4.5 User joins a private conversation to a conference

A.4.5.1 User in a different network

Void

A.5 Flows demonstrating a user subscribing to the conference event package

A.5.1 Introduction

Void

A.5.2 User subscribing to the conference event package

A.5.2.1 MRFC/AS is not located in user's home network

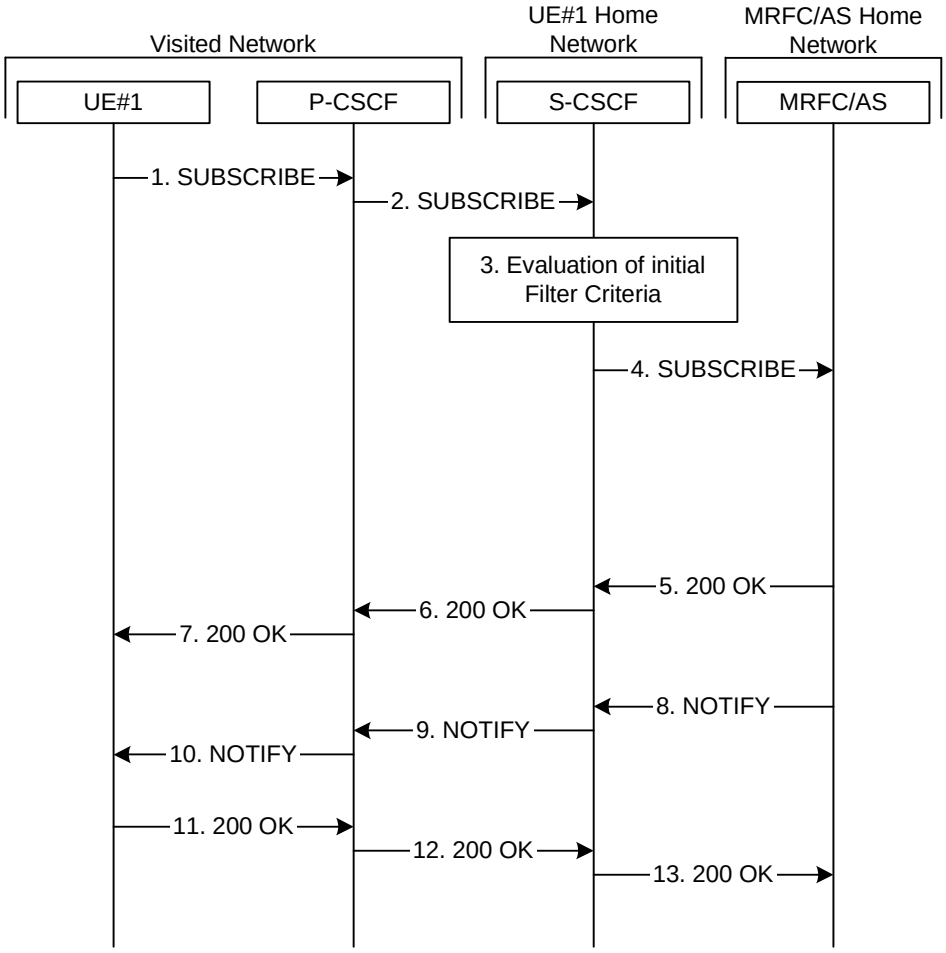

Figure A.5.2.1-1: User subscribing to conference event package - MRFC/AS is not located in user's home network

Figure A.5.2.1-1 shows an user subscribing to the conference state event for a specific conference that is provided at a MRFC/AS located in another network. The conference URI, which is used for subscription to the conference event package, does include a FQDN in the host part in this example.

The details of the flows are as follows:

1. **SUBSCRIBE request (UE to P-CSCF) - see example in table A.5.2.1-1**

   A UE wants to get informed about the state of a certain conference, the involved users and their related media states. The conference is identified by a conference URI. In order to initiate a subscription to the MRFC/AS, the UE generates a SUBSCRIBE request containing the 'conference' event, together with the length of time this periodic subscription should last.

Table A.5.2.1-1: SUBSCRIBE request (UE to P-CSCF)

```
SUBSCRIBE sip:conference1@mrfc2.home2.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: <sip:user1_public1@home1.net>
Privacy: none
From: <sip:user1_public1@home1.net>;tag=31415
To: <sip:conference1@mrfc2.home2.net>
Call-ID: b89rjhnedlrfjflslj40a222
CSeq: 61 SUBSCRIBE
Require: sec-agree
Proxy-Require: sec-agreeSecurity-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432;
spi-s=87654321; port-c=8642; port-s=7531
Event: conference
Expires: 7200
Accept: application/conference-info+xml
Contact: <sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp>
Content-Length: 0
```

Request-URI: contains the conference URI.

2. **SUBSCRIBE request (P-CSCF to S-CSCF) - see example in table A.5.2.1-2**

The SUBSCRIBE request is forwarded to the S-CSCF.

Table A.5.2.1-2: SUBSCRIBE request (P-CSCF to S-CSCF)

```
SUBSCRIBE sip:conference1@mrfc2.home2.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
P-Access-Network-Info:
Max-Forwards: 69
P-Asserted-Identity: <sip:user1_public1@home1.net>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
Privacy:
Route: <sip:orig@scscf1.home1.net;lr>
Record-Route: <sip:pcscf1.visited1.net;lr>
From:
To:
Call-ID:
CSeq:
Event:
Expires: Accept:
Contact:
Content-Length:
```

3. **Evaluation of initial filter criteria**

The S-CSCF validates the service profile of this subscriber and evaluates the initial filter criteria.

4. **SUBSCRIBE request (S-CSCF to MRFC/AS) - see example in table A.5.2.1-4**

   S-CSCF forwards the SUBSCRIBE request to the MRFC/AS based on the Request URI of the SUBSCRIBE request. The S-CSCF does not re-write the Request URI.

Table A.5.2.1-4: SUBSCRIBE request (S-CSCF to MRFC/AS)

```
SUBSCRIBE sip:conference1@mrfc2.home2.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK351g45.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 67
P-Asserted-Identity:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net
Privacy:
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1;lr>
From:
To:
Call-ID:
CSeq:
Event:
Expires: Accept:
Contact:
Content-Length:
```

5. **200 (OK) response (MRFC/AS to S-CSCF) - see example in table A.5.2.1-5 (related to table A.5.2.1-4)**

   The MRFC/AS performs the necessary authorization checks on the originator to ensure that he/she is allowed to subscribe to this specific conference. In this example the conditions have been met, so the MRFC/AS acknowledges the SUBSCRIBE request (6) with a 200 (OK) response.

Table A.5.2.1-5: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK351g45.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net;
   term-ioi=home2.net
From:
To: <sip:conference1@mrfc2.home2.net>;tag=151170
Call-ID:
CSeq:
Event:
Expires:
Contact: <sip:conference1@mrfc2.home2.net>
Content-Length:
```

6. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.5.2.1-6**

   S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.5.2.1-6: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"
From:
To:
Call-ID:
CSeq:
Event:
Expires:
Contact:
Content-Length:
```

7. **200 (OK) response (P-CSCF to UE) - see example in table A.5.2.1-7**

   The P-CSCF forwards the 200 (OK) response to the UE.

Table A.5.2.1-7: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route:
From:
To:
Call-ID:
CSeq:
Event:
Expires:
Contact:
Content-Length:
```

8. **NOTIFY request (MRFC/AS to S-CSCF) - see example in table A.5.2.1-8**

   The MRFC/AS generates a NOTIFY request that includes information about all participants that the subscribing user is allowed to see. The information about one participant includes:

   - the SIP URI identifying the user;
   - the dialog state associated for that users attachment to the conference; and
   - the users status in terms of media in the conference.

Table A.5.2.1-8: NOTIFY request (MRFC/AS to S-CSCF)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP mrfc2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 70
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"; orig-ioi=home1.net
Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
From: <sip:conference1@mrfc2.home2.net>;tag=151170
To: <sip:user1_public1@home1.net>;tag=31415
Call-ID: b89rjhnedlrfjflslj40a222
CSeq: 42 NOTIFY
Subscription-State: active ;expires=7200
Event: conference;recurse
Contact: <sip:conference1@mrfc2.home2.net>
Content-Type: application/conference-info+xml
Content-Length: (...)

   <?xml version="1.0" encoding="UTF-8"?>
   <conference-info   xmlns="urn:ietf:params:xml:ns:conference-info">
                      entity="conference1@mrfc2.home1.net"
                      state="full"
                      version="0"
     <user entity="sip:user1_public1@home1.net">
      <display- text>John Doe</display-text>
      <endpoint entity=" sip:[5555::eee:fff:aaa:bbb]">
       <status>connected</status>
       <joining-method>dialed-in</joining-method>
       <media id="1">
        <type>audio</type>
        <label>34567</label>
        <src-id>534232</src-id>
        <status>sendrecv</status>
       </media>
      </endpoint>
     <user entity="sip:user3_public1@home3.net">
      <display- text>Simon Moon</display-text>
      <endpoint entity=" sip:[5555::eee:fff:aaa:bbb]">
       <status>on-hold</status>
       <joining-method>dialed-in</joining-method>
       <media id="1">
        <type>audio</type>
        <label>34567</label>
        <src-id>534232</src-id>
        <status>sendrecv</status>
       </media>
      </endpoint>
     </user>
   </conference-info>
```

P-Charging-Vector: The MRFC/AS populates the icid parameter with a globally unique value and populates the identifier of its own network to the terminating Inter Operator Identifier (IOI) parameter of this header.

The message body in the NOTIFY request that carries the conference state information of the conference participants is formed as indicated in RFC 4575 [11].

9. **NOTIFY request (S-CSCF to P-CSCF) - see example in table A.5.2.1-9**

The S-CSCF forwards the NOTIFY request to the P-CSCF.

Table A.5.2.1-9: NOTIFY request (S-CSCF to P-CSCF)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 69
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Route: <sip:pcscf1.visited1.net;lr>
From:
To:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Type:
Content-Length:

(...)
```

10. **NOTIFY request (P-CSCF to UE) - see example in table A.5.2.1-10**

The P-CSCF forwards the NOTIFY request to the UE.

Table A.5.2.1-10: NOTIFY request (P-CSCF to UE)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UPD
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP mrfc2.home2.net;branch=z9hG4bK348923.1
Max-Forwards: 68
From:
To:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Type:
Content-Length:

(...)
```

11. **200 (OK) response (UE to P-CSCF) - see example in table A.5.2.1-11 (related to table A.5.2.1-10)**

The UE acknowledges the NOTIFY request with a 200 (OK) response to the P-CSCF.

Table A.5.2.1-11: 200 (OK) response (UE to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UPD
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP mrfc2.home2.net;branch=z9hG4bK348923.1
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

12. **200 (OK) response (P-CSCF to S-CSCF) - see example in table A.5.2.1-12**

The P-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.5.2.1-12: 200 (OK) response (P-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UPD scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc2.home2.net;branch=z9hG4bK348923.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"
P-Access-Network-Info:
From:
To:
Call-ID:
CSeq:
Content-Length:
```

13. **200 (OK) response (S-CSCF to MRFC/AS) - see example in table A.5.2.1-13**

The S-CSCF forwards the 200 (OK) response to the MRFC/AS.

Table A.5.2.1-13: 200 (OK) response (S-CSCF to MRFC/AS)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP mrfc2.home2.net;branch=z9hG4bK348923.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=123551024"; orig-ioi=home1.net;
   term-ioi=home1.net
From:
To:
Call-ID:
CSeq:
Content-Length:
```

A.6 Flows demonstrating a user leaving a conference

A.6.1 Introduction

Void

A.6.2 User leaving the conference

A.6.2.1 MRFC/AS is located in user's home network

Figure A.6.2.1-1 shows an user leaving a conference. The example shows the flow for the user, who created the conference with a conference-factory URI. For this example it is assume that the user is subscribed to the conference state event package at the MRFC/AS.

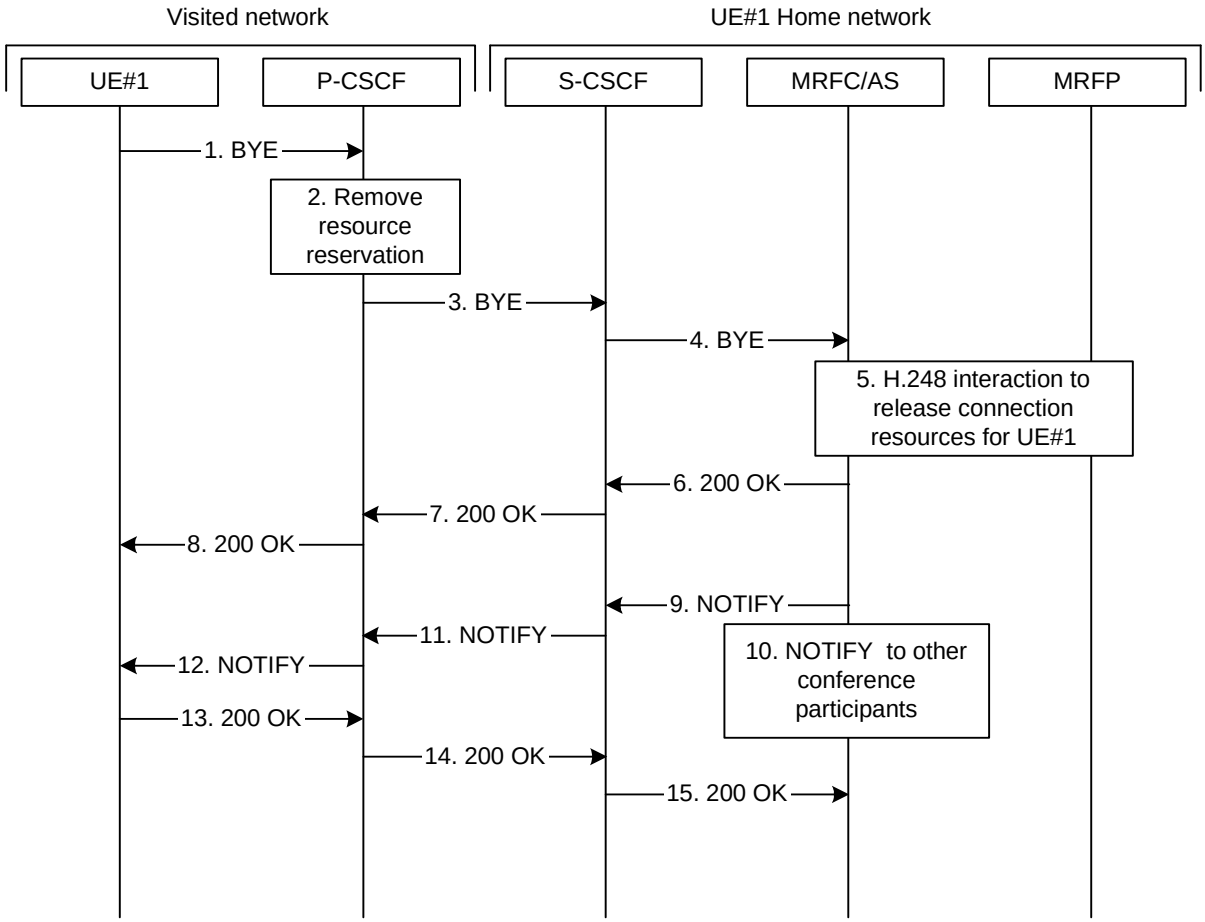

Figure A.6.2.1-1: User leaving a conference

The details of the flows are as follows.

1. **BYE (UE to P-CSCF) - see example in table A.6.2.1-1**

   A UE wants to leave a conference. For this purpose the UE sends a BYE message to the P-CSCF with the Conference-URI as the Request-URI.

Table A.6.2.1-1: BYE (UE to P-CSCF)

```
BYE sip:conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From: <sip:user1_public1@home1.net>; tag=171828
To: <sip:conference-factory1@mrfc1.home1.net>; tag=314159
Call-ID: cb03a0s09a2sdfglkj490333
Require: sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Cseq: 153 BYE
Content-Length: 0
```

Request-URI: contains the value of the Conference-URI as learned during conference creation.

2. **Remove resource reservation**

   The P-CSCF removes the authorization for resources that had previously been issued for this endpoint for this session. This step will also result in a release indication to the GPRS subsystem to confirm that the IP bearers associated with the session have been deleted.

3. **BYE (P-CSCF to S-CSCF) - see example in table A.6.2.1-3**

   The P-CSCF removes the Security-Verify header, and the "sec-agree" option tag from the Require and Proxy-Require headers. As the Require and Proxy-Require headers are empty, it removes these headers completely.

Table A.6.2.1-3: BYE (P-CSCF to S-CSCF)

```
BYE sip:conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 69
Route: <sip:orig@scscf1.home1.net;lr>
P-Access-Network-Info:
From:
To:
Call-ID:
Cseq:
Content-Length: 0
```

4. **BYE (S-CSCF to MRFC/AS) - see example in table A.6.2.1-4**

   The S-CSCF forwards the BYE to the MRFC/AS.

Table A.6.2.1-4: BYE (S-CSCF to MFRC/AS)

```
BYE sip:conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
P-Access-Network-Info:
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:
```

5. **H.248 interaction to release resources**

   The MRFC/AS interacts with the MRFP to release the resources reserved for UE#1 in this conference.

6. **200 (OK) response (MRFC/AS to S-CSCF) - see example in table A.6.2.1-6**

   After successfully releasing the resources from the MRFP, the MRFC/AS sends a 200 (OK) response request to the S-CSCF.

Table A.6.2.1-6: 200 (OK) response (MRFC/AS to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
Cseq:
Content-Length:
```

7. **200 (OK) response (S-CSCF to P-CSCF) - see example in table A.6.2.1-7**

   S-CSCF forwards the 200 (OK) response to the P-CSCF.

Table A.6.2.1-7: 200 (OK) response (S-CSCF to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
Cseq:
Content-Length:
```

8. **200 (OK) response (P-CSCF to UE) - see example in table A.6.2.1-8**

   P-CSCF forwards the message to the UE.

Table A.6.2.1-8: 200 (OK) response (P-CSCF to UE)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
Cseq:
Content-Length:
```

9. **NOTIFY request (MRFC/AS to S-CSCF) - see example in table A.6.2.1-9**

The MRFC/AS generates a NOTIFY request to indicate that UE#1 has left the conference and automatically unsubscribe UE#1 from its subscription to the conference event package.

Table A.6.2.1-9: NOTIFY request (MRFC/AS to S-CSCF)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK348923.1
Max-Forwards: 70
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=223551024"; orig-ioi=home1.net
Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
From: <sip:conference1@mrfc1.home1.net>;tag=151170
To: <sip:user1_public1@home1.net>;tag=31415
Call-ID: b89rjhnedlrfjflslj40a222
CSeq: 42 NOTIFY
Subscription-State: terminated
Event: conference
Contact: <sip:conference1@mrfc1.home1.net>
Content-Type: application/conference-info+xml
Content-Length: (...)

   <?xml version="1.0" encoding="UTF-8"?>
   <conference-info   xmlns="urn:ietf:params:xml:ns:conference-info">
                      entity="conference1@mrfc1.home1.net"
                      state="full"
                      version="1"
     <user entity="sip:user1_public1@home1.net">
      <display- text>John Doe</display-text>
      <endpoint entity="sip:[5555::aaa:bbb:ccc:ddd]">
       <status>disconnected</status>
       <disconnection-method>departed</disconnection-method>
      </endpoint>
     </user>
     <user entity="sip:user3_public1@home3.net">
       <display- text>Simon Moon</display-text>
      <endpoint entity=" sip:[5555::eee:fff:aaa:bbb]">
       <status>connected</status>
       <joining-method>dialed-in</joining-method>
       <media id="1">
        <type>audio</type>
        <label>34567</label>
        <src-id>534282</src-id>
        <status>inactive</status>
       </media>
      </endpoint>
     </user>
   </conference-info>
```

P-Charging-Vector: The MRFC/AS populates the icid parameter with a globally unique value and populates the identifier of its own network to the originating Inter Operator Identifier (IOI) parameter of this header.

P-Charging-Function-Addresses: The MRFC/AS populates the P-Charging-Function-Addresses header field to be passed to the S-CSCF.

Subscription-State: Value of "terminated" indicates that the UE has been unsubscribed from the conference event package.

The message body in the NOTIFY request that carries the conference state information of the conference participants is formed as indicated in RFC 4575 [11].

10. Other conference participants are notified

MRFC/AS similarly notifies other conference participants that have subscribed to the conference event package that UE#1 has left the conference.

11. **NOTIFY request (S-CSCF to P-CSCF) - see example in table A.6.2.1-11**

The S-CSCF forwards the NOTIFY request to the P-CSCF.

Table A.6.2.1-11: NOTIFY request (S-CSCF to P-CSCF)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK348923.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=223551024"
P-Charging-Function-Addresses: ccf=[5555::b99:c88:d77:e66]; ccf=[5555::a55:b44:c33:d22];
   ecf=[5555::1ff:2ee:3dd:4cc]; ecf=[5555::6aa:7bb:8cc:9dd]
Max-Forwards: 69
Route: <sip:pcscf1.visited1.net;lr>
From:
To:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Type:
Content-Length:

(...)
```

12. **NOTIFY request (P-CSCF to UE) - see example in table A.6.2.1-12**

The P-CSCF forwards the NOTIFY request to the UE.

Table A.6.2.1-12: NOTIFY request (P-CSCF to UE)

```
NOTIFY sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net:7531;comp=sigcomp;branch=z9hG4bK240f34.1, SIP/2.0/UPD
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK348923.1
Max-Forwards: 68
From:
To:
Call-ID:
CSeq:
Subscription-State:
Event:
Contact:
Content-Type:
Content-Length:

(...)
```

13. **200 (OK) response (UE to P-CSCF) - see example in table A.6.2.1-13 (related to table A.6.2.1-12)**

The UE acknowledges the NOTIFY request with a 200 (OK) response to the P-CSCF.

Table A.6.2.1-13: 200 (OK) response (UE to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net:7531;comp=sigcomp;branch=z9hG4bK240f34.1, SIP/2.0/UPD
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK348923.1
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From:
To:
Call-ID:
CSeq:
Content-Length: 0
```

14. **200 (OK) response (P-CSCF to S-CSCF) - see example in table A.6.2.1-14**

The P-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.6.2.1-14: 200 (OK) response (P-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UPD scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK348923.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=223551024"
P-Access-Network-Info:
From:
To:
Call-ID:
CSeq:
Content-Length:
```

15. **200 (OK) response (S-CSCF to MRFC/AS) - see example in table A.6.2.1-15**

The S-CSCF forwards the 200 (OK) response to the MRFC/AS.

Table A.6.2.1-15: 200 (OK) response (S-CSCF to MRFC/AS)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK348923.1
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=223551024"; orig-ioi=home1.net;
   term-ioi=home1.net
P-Access-Network-Info:
From:
To:
Call-ID:
CSeq:
Content-Length:
```

A.6.3 User requesting to remove another user from conference

The call flows for a user requesting the removal of another user from a conference are basically identical to the call flows for a user requesting IMS to join another user (see subclause A.4.4). The call flows only differ in the Refer-To header of the REFER request, namely in the 'method" parameter which is set to 'BYE" instead of 'INVITE" and the tasks performed by the MRFC/AS before sending the NOTIFY requests.

A.6.4 MRFC/AS drops a user from a conference

A.6.4.1 MRFC/AS is located in user's home network

Figure A.6.4.1-1 shows an MRFC/AS dropping a user from a conference.

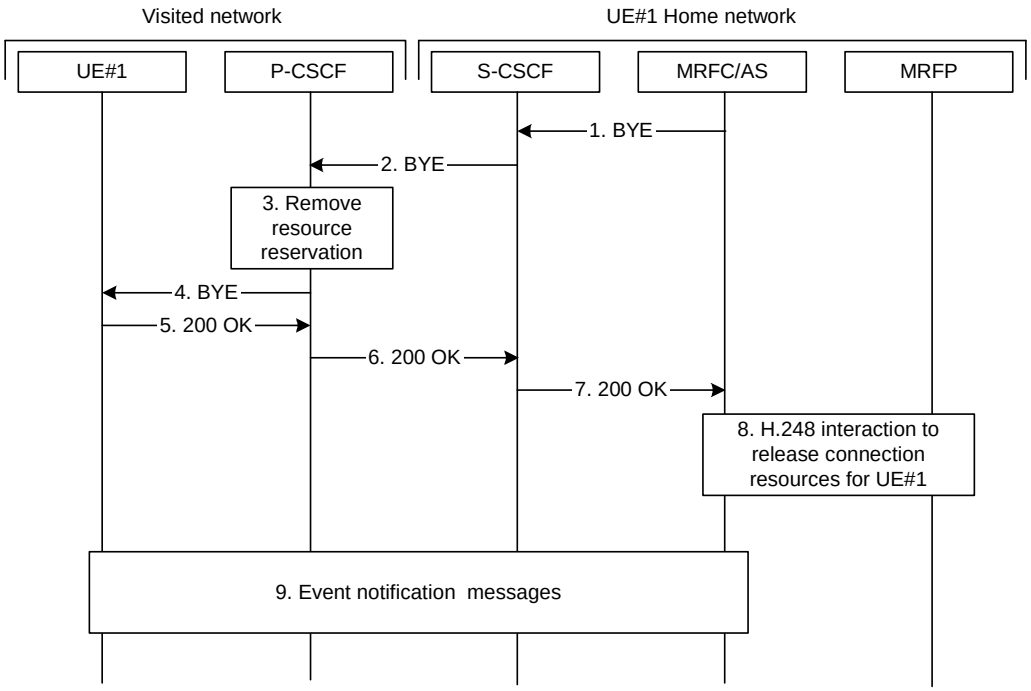

Figure A.6.4.1-1: MRFC/AS dropping a user from a conference

The details of the flows are as follows.

1. **BYE (MRFC/AS to S-CSCF) - see example in table A.6.4.1-1**

   MRFC/AS decides to drop a user from a conference. The decision may be based on a change in the conference policy, because the conference lifetime is exceeded, or some other reason.

   The MRFC/AS issues a BYE request to the S-CSCF.

Table A.6.4.1-1: BYE (MRFC/AS to S-CSCF)

```
BYE sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK348923.1
Max-Forwards: 70
Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.visited1.net;lr>
From: <sip:conference1@mrfc1.home1.net>; tag=314159
To: <sip:user1_public1@home1.net>; tag=171828
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 73 BYE
Content-Length: 0
```

Request-URI: contains the Contact address of the dropped user.

2. **BYE (S-CSCF to P-CSCF) - see example in table A.6.4.1-2**

   The S-CSCF forwards the BYE request to the P-CSCF.

Table A.6.4.1-2: BYE (S-CSCF to P-CSCF)

```
BYE sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK348923.1
Max-Forwards: 69
Route: <sip:pcscf1.visited1.net;lr>
From:
To:
Call-ID:
Cseq:
Content-Length:
```

3. **Remove resource reservation**

   The P-CSCF removes the authorization for resources that had previously been issued for this endpoint for this session. This step will also result in a release indication to the GPRS subsystem to confirm that the IP bearers associated with the session have been deleted.

4. **BYE (P-CSCF to UE) - see example in table A.6.4.1-4**

   The P-CSCF forwards the BYE to the UE.

Table A.6.4.1-4: BYE (P-CSCF to UE)

```
BYE sip:[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp SIP/2.0
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK348923.1
Max-Forwards: 68
From:
To:
Call-ID:
Cseq:
Content-Length:
```

5. **200 (OK) response (UE to P-CSCF) - see example in table A.6.4.1-5**

   After successfully releasing the resources from the MRFP, the MRFC/AS sends a 200 (OK) response to the S-CSCF.

Table A.6.4.1-5: 200 (OK) response (UE to P-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK348923.1
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
From:
To:
Call-ID:
Cseq:
Content-Length: 0
```

6. **200 (OK) response (P-CSCF to S-CSCF) - see example in table A.6.4.1-6**

   P-CSCF forwards the 200 (OK) response to the S-CSCF.

Table A.6.4.1-6: 200 (OK) response (P-CSCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   mrfc1.home1.net;branch=z9hG4bK348923.1
P-Access-Network-Info:
From:
To:
Call-ID:
Cseq:
Content-Length:
```

7. **200 (OK) response (S-CSCF to MRFC/AS) - see example in table A.6.4.1-7**

   S-CSCF forwards the 200 (OK) response to the MRFC/AS.

Table A.6.4.1-7: 200 (OK) response (S-CSCF to MRFC/AS)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK348923.1
P-Access-Network-Info:
From:
To:
Call-ID:
Cseq:
Content-Length:
```

8. **H.248 interaction to release resources**

   MRFC/AS interacts with the MRFP to release the resources reserved for UE#1 in this conference.

9. **Conference event package messages**

   The MRFC/AS also terminates the user's subscription to the conference state event package. The message flow is identical to messages 6.5.2.1-9 to 6.5.2.1-15 in subclause 6.5.2.1. for an user leaving a conference.

A.7 Flows demonstrating conference termination

A.7.1 General

The SIP based flows for conference termination look identical to the call flows for a user leaving a conference (see subclause A.6.2) / a user being removed from a conference (see subclause A.6.4). The termination of the conference itself, after the last user has left / has been removed from the conference does not result in any exchange of SIP messages.

A.8 Flows demonstrating usage of hold and resume during conferences

The hold- and resume-service is already described in 3GPP TS 24.228 [4] and the related call flows can be readily applied for the IMS conferencing service. The handling of a conference put on hold by one user is a local matter at the MRFC.

A.9 Flows demonstrating the use of the Replaces header

A.9.1 POTS subscriber invited to a conference

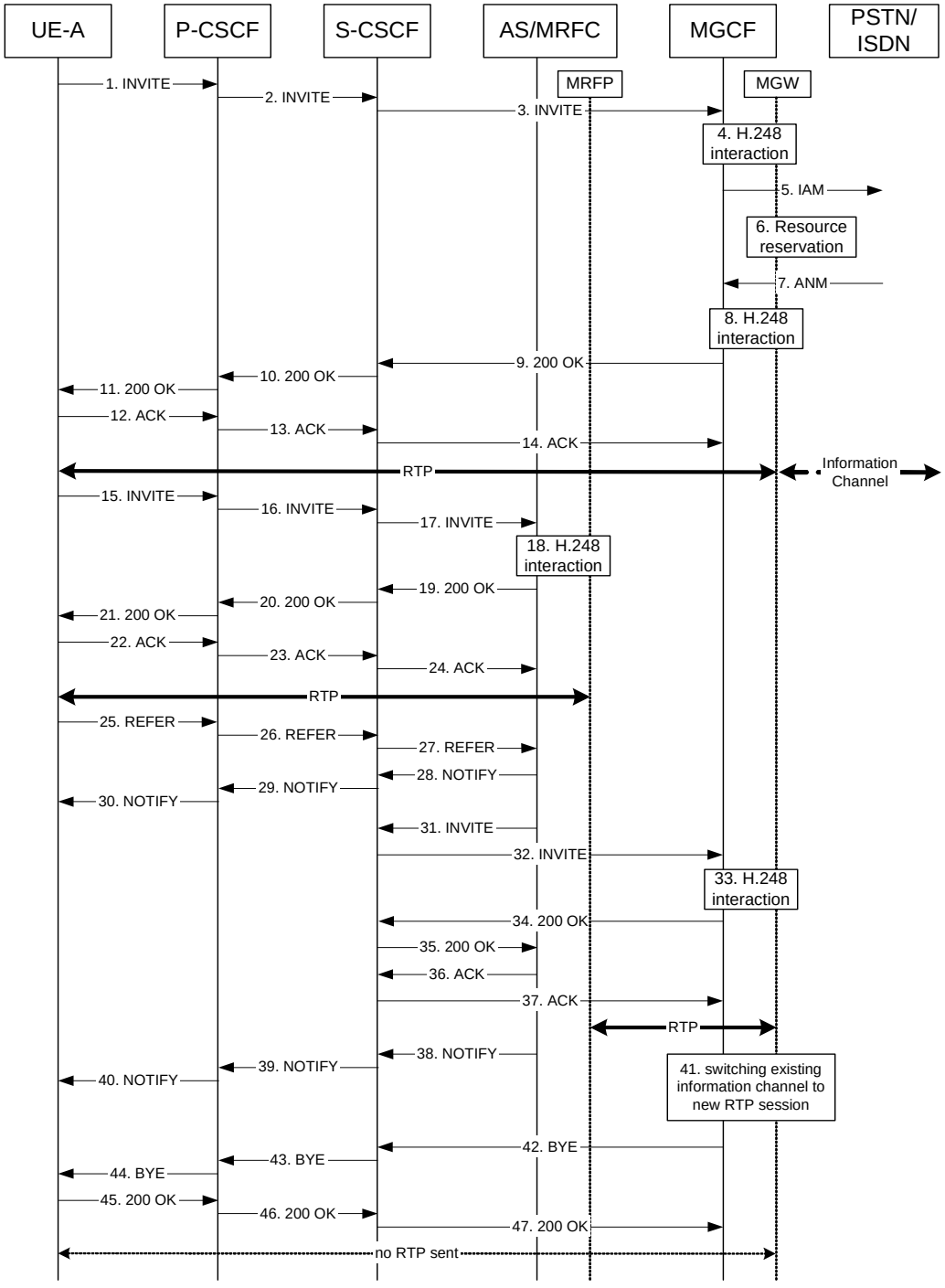

Figure A.9-1: CONF interworking signalling flow in case of an active session between NGN and PSTN

UE-A is in an active voice session with a PSTN/ISDN TE (SIP dialog with Call-ID, to-tag and from-tag between UE-A and MGCF). It then creates a conference and invites the PSTN/ISDN TE to the conference by sending a REFER to the conference focus, which invites the PSTN/ISDN TE to the conference by sending an INVITE which includes the Replaces header to the MGCF. The MGCF confirms the session, switches the existing information channel to the new RTP session, and terminates the session which is replaced.

NOTE: The example given in the figure above assumes that the INVITE request sent from the UE and the INVITE request sent from the AS/MRFC are routed to the same MGCF.

1. – 3. UE-A initiates a voice session with a PSTN/ISDN TE by sending an INVITE to the MGCF.

Table A.9-1: 1.INVITE (UE-A to P-CSCF)

```
INVITE tel:+1-212-555-2222 SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>;tag=171828
To: <tel:+1-212-555-2222>
Call-ID: cb03a0s09a2sdfglkj490333
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Supported: precondition, 100rel, gruu, 199
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321; port-
   c=8642; port-s=7531
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Accept:application/sdp, application/3gpp-ims+xml
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=video 3400 RTP/AVP 98 99
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

NOTE: Intermediate steps (183 (Session Progress), PRACK, UPDATE and releated responses are not shown)

4. H.248 interaction

5. SS7: IAM

6. resource reservation

7. SS7: ANM

8. H.248 interaction

9. – 11. The MGCF sends a final response back to the session originator.

Table A.9-2: 9. 200 OK (MGCF to S-CSCF)

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP bgcf1.home1.net;branch=z9hG4bK6546q2.1, SIP/2.0/UDP
   scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
   pcscf1.home1.net;branch=z9hG4bK431h23.1, SIP/2.0/UDP
   [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Record-Route: <sip:scscf1.home1.net;lr>, <sip:pcscf1.home1.net;lr>
P-Asserted-Identity: <tel:+1-212-555-2222>
P-Charging-Vector:
Privacy: none
From:
To: <tel:+1-212-555-2222>;tag=314159
Call-ID:
CSeq:
Contact: <sip:mgcf1.home1.net>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE
RSeq: 9021
Content-Length: 0
```

12. – 14. The Calling party acknowledges the final response with an ACK request.

15. – 24. UE-A creates a conference by sending an INVITE to the Conference URI and connects to the conference.

Table A.9-3: 15. INVITE request (UE-A to P-CSCF)

```
INVITE sip:conference-factory1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171829
To: <sip:conference-factory1@mrfc1.home1.net>
Call-ID: cb03a0s09a2sdfglkj490444
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Supported: precondition, 100rel, gruu, 199
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Contact: <sip:user1_public1@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
Accept:application/sdp,.application/3gpp-ims+xml
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=video 3400 RTP/AVP 98 99
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MPVMP4V-ES
m=audio 3456 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

NOTE: Intermediate steps (183 (Session Progress), PRACK, UPDATE and releated responses are not shown)

25. – 27. UE-A invites the PSTN/ISDN TE to the conference by sending a REFER reqest to the conference focus, the "method" parameter set to "INVITE". The Refer-To header of the REFER request includes the Replaces parameter with Call-ID, to-tag and from-tag from the existing SIP dialog.

Table A.9-4: 25. REFER request (UE-A to P-CSCF)

```
REFER sip: conference1@mrfc1.home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From: <sip:user1_public1@home1.net>; tag=171829
To: <sip:conference1@mrfc1.home1.net>

Call-ID: cb03a0s09a2sdfglkj490555
Cseq: 127 REFER
Require: sec-agree
Refer-To: <sip:+1-212-555-
   2222@home1.net;user=phone;method=INVITE?Replaces=cb03a0s09a2sdfglkj490333%3Bto-tag%3D
   314159%3Bfrom-tag%3D 171828>
Referred-By: <sip:user1_public1@home1.net>
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi-c=98765432; spi-s=87654321;
   port-c=8642; port-s=7531
Contact: <sip:user1_public1@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
   ;comp=sigcomp>
Content-Length: 0
```

28. – 30. The conference focus sends a NOTIFY request containing information about the progress of the REFER request processing. The Subscription-State is set to "active".

31. – 32.. The conference focus invites the PSTN/ISDN TE by sending a INVITE request to the MGCF. The INVITE request includes the Replaces header with Call-ID, to-tag and from-tag from the existing SIP dialog.

Table A.9-5: INVITE request (MRFC/AS to S-CSCF)

```
INVITE tel:+1-212-555-2222 SIP/2.0
Via: SIP/2.0/UDP mrfc1.home1.net;branch=z9hG4bK23273846
Max-Forwards: 70
P-Asserted-Identity: <sip:conference1@mrfc1.home1.net>
P-Charging-Vector: icid-value="AyretyU0dm+6O2IrT5tAFrbHLso=023551024"; orig-ioi=home1.net
Privacy: none
From: <sip:conference1@mrfc1.home1.net>;tag=171123
To: <tel: +1-212-555-2222>

Call-ID: bc03a0s09a2sdfglkj490333
Cseq: 127 INVITE
Require: replaces
Replaces: cb03a0s09a2sdfglkj490333;to-tag=314159;from-tag=171828
Supported: precondition, 100rel, gruu
Referred-By: <sip:user1_public1@home1.net>
Contact: <sip:conference1@mrfc1.home1.net>;isfocus
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY, PUBLISH
Allow-Events: conference, pending-additions
Content-Type: application/sdp
Content-Length: (…)

v=0
o=- 2987933615 2987933615 IN IP6 5555::abc:def:abc:abc
s=-
c=IN IP6 5555::abc:def:abc:def
t=0 0
m=video 10001 RTP/AVP 98
b=AS:75
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
m=audio 6544 RTP/AVP 97 96
b=AS:25.4
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=inactive
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; maxframes=2
a=rtpmap:96 telephone-event
```

NOTE: Intermediate steps (183 (Session Progress), PRACK, UPDATE and releated responses are not shown)

33. H.248 interaction.

34. – 35. The MGCF sends a final response back to the session originator.

36. – 37. The Calling party acknowledges the final response with an ACK request.

38. – 40. The conference focus sends a NOTIFY request containing information about the progress of the REFER request processing. The Subscription-State is set to "terminated".

41. The MGCF replaces the existing RTP stream to UE-A with the new RTP stream to the conference mixer.

42. – 44. The MGCF releases the session with UE-A by sending a BYE request to UE-A.

45. – 47. UE-A responds with a 200 OK response.

Annex B (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2003-06					Version 0.0.1: Initial version for discussion on conference call with interested parties		
2003-06					Version 0.0.2: Revised version after phone conference; - introducing new structure for clauses 5 to 8 - Annex A made informative - editorial issues - alignment between Conferencing and Presence TS		
2003-06					Version 0.0.3: - introduced editorial changes as indicated on CN1 Mailing list - introduced references to RFC 3261 and SIP conf framework draft - clarified the relation of roles and functional entities in clause 5 and 6		
2003-06					Version 0.0.4: added TS-number		
2003-07					Version 0.0.5: small editorials Added some abbreviations		
2003-08					Version 0.0.6: updates due to comments received during CN1#31 - deleted former clause A.8 (Flow demonstrating SIMPLE based instant message conferences)	N1-031122	N1-031280
2003-09					Version 0.1.0: Title updated		
2004-05					Version 1.0.0 created as the outcome of CN#34 (Zagreb, Croatia). Material was shifted from version 3GPP TR 29.847 version 2.0.0 based on the agreed CR in N1-040875.		
2004-05					Version 1.0.1 created due to editorials indicated by e-mail after CN1#34 meeting. Furthermore re-introduced last paragraph of scope clause as well as two editor's notes, as they could not be agreed to be deleted (they were deleted during the shifting process).		
2004-06					Version 1.1.0 created as the outcome of CN#34bis (Helsinki, Finland). Changes applied based on the following agreed tdocs: - N1-041127 - Messaging Conferences Editors Note Deletion - N1-041128 - Shifting Leftovers - N1-041130 - Discovery Deletion - N1-041131 - Air Interface Load - N1-041163 - SDP for UE - N1-041165 - CN5 Work Editors Note Deletion - N1-041213 - Clause 5, editorial issues - N1-041256 - Abnormal Cases Cleanup - N1-041258 - Auto Unsubscribe - N1-041259 - AS originated requests - N1-041261 - Authentication Procedure - N1-041264 - Reference to Referred-By - N1-041291 - Cx PSI Query - N1-041292 - CPCP clarifications - N1-041293 - Conference Termination by Means of CPCP - N1-041311 - Simplification of CPCP clause Smaller editorial changes, especially in the area of protected spaces and references to draft-numbers, were performed by the editor without asking for further permission.		
2004-08					Version 1.2.0 created as the outcome of CN#35 (Sophia Antipolis, France). Changes applied based on the following agreed tdocs: - N1-041363 - request handling in focus - N1-041459 - scope corrections - N1-041574 - removal of all conference participants - N1-041575 - rework of CPCP clause - N1-041576 - security procedure in CPCP flows - N1-041577 - adding of floor control protocol Smaller editorial changes were performed by the editor.		
2004-09					Version 2.0.0 created to be sent for approval, editorial changes introduced by ETSI/MCC	1.2.0	2.0.0
2004-09	NP-25	NP-040367			The draft was approved and the specification TS 24.147 is brought under the change control. Additional editorial clean-up by ETSI/MCC.	2.0.0	6.0.0
2004-12	NP-26	NP-040505	001		Removing editor's note on other protocols	6.0.0	6.1.0
2004-12	NP-26	NP-040505	007		Alternative procedure for removing all conference participants	6.0.0	6.1.0
2004-12	NP-26	NP-040505	008	1	Update of SIP Chapter to new CPCP terminology	6.0.0	6.1.0
2004-12	NP-26	NP-040505	009		Update of CPCP Chapter	6.0.0	6.1.0

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2004-12	NP-26	NP-040505	010	1	Removal of "Conference Notification Service" Role	6.0.0	6.1.0
2004-12	NP-26	NP-040505	011	1	Update of signaling flows	6.0.0	6.1.0
2004-12	NP-26	NP-040505	012	1	Introduction of XCAP Change	6.0.0	6.1.0
2004-12	NP-26	NP-040505	013	1	Correction of BFCP clause	6.0.0	6.1.0
2004-12	NP-26	NP-040505	016	1	Correction Flow Adding a user to the conference with CPCP	6.0.0	6.1.0
2004-12	NP-26	NP-040505	017	1	Correction - Flow 'conference creation with CPCP'	6.0.0	6.1.0
2004-12	NP-26	NP-040505	018	1	Correction expelling/terminating flow using CPCP	6.0.0	6.1.0
2004-12	NP-26	NP-040505	019		p-asserted id in response from conf AS/MRFC	6.0.0	6.1.0
2005-03	NP-27	NP-050072	022	2	Deleting CPCP and BFCP from Rel-6 IMS Conferencing	6.1.0	6.2.0
2005-03	NP-27	NP-050073	020	1	Resolution of references to 24.228	6.1.0	6.2.0
2005-06	CP-28	CP-050060	024		Removal of references related to bootstrapping for the conference service in Release 6	6.2.0	6.3.0
2005-12	CP-30	CP-050552	026		Support of floor control	6.3.0	7.0.0
2006-03	CP-31	CP-060118	0027	1	Shift conference material from 24.819 to 24.147	7.0.0	7.1.0
2006-03	CP-31	CP-060163	0028	2	Removal of the PDF	7.0.0	7.1.0
2006-03	CP-31	CP-060126	0029	-	Inviting to a Conference	7.0.0	7.1.0
2006-03	CP-31	CP-060126	0030	1	Joining a Conferece	7.0.0	7.1.0
2006-03	CP-31	CP-060111	0031	1	Correcting requirement of conference mixer	7.0.0	7.1.0
2006-03	CP-31	CP-060111	0034	1	IETF reference updates	7.0.0	7.1.0
2006-09	CP-33	CP-060467	0037	2	Ad-hoc conferencing with multiple users	7.1.0	7.2.0
2006-09	CP-33	CP-060504	0039	1	Removal of Editor's notes in 24.147	7.1.0	7.2.0
2006-11	CP-34	CP-060655	0041	-	RFC reference update	7.2.0	7.3.0
2007-03	CP-35	CP-070149	0048		BFCP reference update	7.3.0	7.4.0
2007-03	CP-35	CP-070149	0049		SDP usage in association with BFCP	7.3.0	7.4.0
2007-06	CP-36	CP-070370	0050	4	Modification of the conference ability of MGCF	7.4.0	7.5.0
2007-06	CP-36	CP-070387	0055	1	Some corrections to IMS conference	7.4.0	7.5.0
2007-09	CP-37	CP-070595	0056	1	Correction of invitation of users to a conference	7.5.0	7.6.0
2007-09	CP-37	CP-070596	0058	1	Proposal for CONF	7.5.0	7.6.0
2007-12	CP-38	CP-070802	0060	2	Correction of CONF creation by including URI list	7.6.9	7.7.0
2007-12	CP-38	CP-070810	0054	4	Incorporation of roles relating draft-ietf-consent-framework	7.7.0	8.0.0
2008-03	CP-39	CP-080118	0064	2	Support for BYE method	8.0.0	8.1.0
2008-12	CP-42	CP-080854	0067		Media control for conferencing	8.1.0	8.2.0
2008-12	CP-42	CP-080854	0068		Note on conference examples	8.1.0	8.2.0
2008-12	CP-42	CP-080843	0070		Reference updates (release 7 ietf dependencies)	8.1.0	8.2.0
2008-12	CP-42	CP-080848	0071		Reference updates (release 8 ietf dependencies)	8.1.0	8.2.0
2008-12	CP-42	CP-080846	0074	2	Correction of reference and flows in 24.147	8.1.0	8.2.0
2009-09	CP-45	CP-090682	0075	2	Correction of URI list conference activation	8.2.0	9.0.0
2009-12	CP-46	CP-090923	0076		Using conferencing MO	9.0.0	9.1.0
2009-12	CP-46	CP-090940	0077		Obsolete drafts referenced	9.0.0	9.1.0
2009-12	CP-46	CP-090920	0081	1	3-way session creation correction	9.0.0	9.1.0
2009-12	CP-46				Editorial cleanup by MCC	9.0.0	9.1.0
2010-12	CP-50	CP-100864	0084	2	Adding Mr" Interface in the Architecture when providing conference	9.1.0	10.0.0
2011-06	CP-52	CP-110465	0085	2	Clarification of start 3 party call procedure	10.0.0	10.1.0
2011-12	CP-54	CP-110864	0089	3	Deletion of call flow related Editor's Notes in 24.147 (Rel-8)	10.1.0	10.2.0
2011-12	CP-54	CP-110881	0090		RFC Correction 24.147	10.2.0	11.0.0
2012-03	CP-55	CP-120124	0091		Correcting references	11.0.0	11.1.0

History

Document history		
V11.1.0	November 2012	Publication