

# ETSI TS 124 337 V14.1.0 (2025-01)



**Universal Mobile Telecommunications System (UMTS);  
LTE;  
IP Multimedia (IM) Core Network (CN)  
subsystem IP Multimedia Subsystem (IMS) inter-UE transfer;  
Stage 3  
(3GPP TS 24.337 version 14.1.0 Release 14)**



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**Reference**

RTS/TSGC-0124337ve10

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**Keywords**

LTE,UMTS

**ETSI**

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# 1 Scope

IP Multimedia (IM) Core Network (CN) subsystem inter-UE transfer (IUT) provides the capability of continuing ongoing communication sessions with multiple media across different user equipments (UEs) under the control of the same or different subscribers, and as part of Service Continuity (SC).

The present document provides the protocol details for enabling IMS inter-UE transfer based on the Session Initiation Protocol (SIP) and the Session Description Protocol (SDP).

The present document is applicable to User Equipment (UEs) and Application Servers (AS).

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# 2 References

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- 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 22.173: "IP Multimedia Core Network Subsystem (IMS) Multimedia Telephony Service and supplementary services; Stage 1".
- [3] 3GPP TS 23.003: "Numbering, addressing and identification".
- [4] 3GPP TS 23.237: "IP Multimedia subsystem (IMS) Service Continuity; Stage 2".
- [5] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network protocols; Stage 3".
- [6] 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".
- [7] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".
- [8] 3GPP TS 24.238: "Session Initiation Protocol (SIP) based user configuration; Stage 3".
- [9] 3GPP TS 24.292: "IP Multimedia (IM) Core Network (CN) subsystem Centralized Services (ICS); Stage 3".
- [10] 3GPP TS 24.604: "Communication Diversion (CDIV) using IP Multimedia (IM)Core Network (CN) subsystem; Protocol specification".
- [11] 3GPP TS 24.605: "Conference (CONF) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [12] 3GPP TS 24.606: "Message Waiting Indication (MWI) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [13] 3GPP TS 24.607: "Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol Specification".
- [14] 3GPP TS 24.608: "Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR) using IP Multimedia (IM)Core Network (CN) subsystem; Protocol Specification".

- [15] 3GPP TS 24.610: "Communication HOLD (HOLD) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [16] 3GPP TS 24.611: "Anonymous Communication Rejection (ACR) and Communication Barring (CB); using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [17] 3GPP TS 24.629: "Explicit Communication Transfer (ECT) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [18] 3GPP TS 24.239: "Flexible Alerting (FA) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [19] 3GPP TS 24.259: "Personal Network Management (PNM); Stage 3".
- [20] 3GPP TS 24.615: "Communication Waiting (CW) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol Specification".
- [21] 3GPP TS 24.616: "Malicious Communication Identification (MCID) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol Specification".
- [22] 3GPP TS 24.642: "Completion of Communications to Busy Subscriber (CCBS) and Completion of Communications by No Reply (CCNR) using IP Multimedia (IM)Core Network (CN) subsystem; Protocol Specification".
- [23] 3GPP TS 24.647: "Advice Of Charge (AOC) using IP Multimedia (IM)Core Network (CN) subsystem; Protocol Specification".
- [24] 3GPP TS 24.654: "Closed User Group (CUG) using IP Multimedia (IM) Core Network (CN) subsystem, Protocol Specification".
- [25] 3GPP TS 29.292: "Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and MSC Server for IMS Centralized Services (ICS)".
- [26] 3GPP TS 29.328: "IP Multimedia Subsystem (IMS) Sh interface; Signalling flows and message contents".
- [27] 3GPP TS 29.329: "Sh interface based on the Diameter protocol; Protocol details".
- [28] IETF RFC 792 (September 1981): "INTERNET CONTROL MESSAGE PROTOCOL".
- [29] IETF RFC 3023: "XML Media Types".
- [30] IETF RFC 3261: "SIP: Session Initiation Protocol".
- [31] IETF RFC 3264 (June 2002): "An Offer/Answer Model with the Session Description Protocol (SDP)".
- [32] IETF RFC 3515: "The Session Initiation Protocol (SIP) Refer Method".
- [33] IETF RFC 3556 (July 2003): "Session Description Protocol (SDP) Bandwidth Modifier".
- [34] IETF RFC 3840 (August 2004): "Indicating User Agent Capabilities in the Session Initiation Protocol (SIP)".
- [35] IETF RFC 3891: "The Session Initiation Protocol (SIP) "Replaces" Header".
- [36] IETF RFC 3892 (September 2004) "The Session Initiation Protocol (SIP) Referred-By Mechanism".
- [37] IETF RFC 4028: "Session Timers in the Session Initiation Protocol (SIP)".
- [38] IETF RFC 4235 (November 2005): "An INVITE-Initiated Dialog Event Package for the Session Initiation Protocol (SIP)".
- [39] IETF RFC 4353 (February 2006): "A Framework for Conferencing with the Session Initiation Protocol (SIP)".

- [40] IETF RFC 4538: "Request Authorization through Dialog Identification in the Session Initiation Protocol (SIP)".
- [41] IETF RFC 4566: "SDP: Session Description Protocol".
- [42] IETF RFC 4745: "Common Policy: A Document Format for Expressing Privacy Preferences".
- [43] IETF RFC 6157 (April 2011): "IPv6 Transition in the Session Initiation Protocol (SIP)".
- [44] IETF RFC 6809 (November 2012): "Mechanism to Indicate Support of Features and Capabilities in the Session Initiation Protocol (SIP)".
- [45] OMA-TS-XDM-Core-V1\_1: "XML Document Management (XDM) Specification", Version 1.1.
- [46] 3GPP TS 24.141: "Presence service using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [47] IETF RFC 3863: "Presence Information Data Format (PIDF)".
- [48] IETF RFC 6665 (July 2012): "SIP-Specific Event Notification".
- [49] IETF RFC 3856 (August 2004): "A Presence Event Package for the Session Initiation Protocol (SIP)".
- [50] IETF RFC 4661 (September 2006): "An Extensible Markup Language (XML) Based Format for Event Notification Filtering".
- [51] IETF RFC 4660 (September 2006): "Functional Description of Event Notification Filtering".
- [52] IETF RFC 3903 (October 2004): "Session Initiation Protocol (SIP) for Event State Publication".
- [53] IETF RFC 4480 (July 2006): "RPID: Rich Presence Extensions to the Presence Information Data Format (PIDF)".
- [54] IETF RFC 7647 (September 2015): "Clarifications for the Use of REFER with RFC6665".

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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

**Controller capable UE:** A UE that is capable of becoming a controller UE.

**Inter UE Transfer SCC AS URI:** A SIP URI which is a public service identity hosted by SCC AS and which is used in inter UE transfer procedures.

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.237 [4] apply:

**Remote Leg**  
**Collaborative session**  
**Controllee UE**  
**Controller UE**  
**Inter-UE transfer**  
**Service Continuity**

For the purposes of the present document, the following terms and definitions given in IETF RFC 4353 [39] apply:

**Conference**  
**Conference URI**

**Focus  
Participant**

For the purposes of the present document, the following terms and definitions given in IETF RFC 3264 [31] apply:

**Directionality**

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

SC	Service Continuity
SCC	Service Centralization and Continuity
STI	Session Transfer Identifier
XCAP	Extensible Markup Language (XML) Access Configuration Protocol
XML	Extensible Markup Language

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# 4 Overview of IP Multimedia (IM) Core Network (CN) subsystem inter-UE transfer

## 4.1 General

Inter-UE transfer provides the capability of transferring the communication sessions with multiple media across different UEs and is part of Service Continuity (SC) as described in 3GPP TS 23.237 [4].

Inter-UE transfer does not apply to emergency calls as described in 3GPP TS 24.229 [7].

Inter-UE transfer is an optional part of SC.

The following procedures are provided within this document:

- procedures for UE discovery for inter-UE transfer are specified in clause 9;
- procedures for inter-UE transfer without establishment of collaborative session are specified in clause 10;
- procedures for collaborative session establishment for inter-UE transfer are specified in clause 11;

NOTE 1: The procedures in clause 11 are related to scenarios in which the collaborative session is set up by the controller UE when an end-to-end session already has been established with the remote UE.

- procedures for media transfer within collaborative session for inter-UE transfer are specified in clause 12;
- procedures for release of collaborative session for inter-UE transfer in clause 13;
- procedures for addition and deletion of media with collaborative session for inter-UE transfer in clause 14;
- procedures for session discovery in clause 15;
- procedures for collaborative sessions of participants of different subscriptions are specified in clause 16;
- procedures for establishment of collaborative sessions during session setup are specified in clause 17;

NOTE 2: The procedures in clause 17 are related to scenarios in which the collaborative session and the session towards the remote UE are set up in parallel.

- procedures for assignment and transfer of control of a collaborative session are specified in clause 18;
- procedures for media flow transfer within a collaborative session are specified in clause 19;
- procedures for session replication / media replication performed by the SCC AS are specified in clause 20;

- procedures for session replication / media replication performed by the remote UE are specified in clause 21;
- procedures for collaborative session handling upon loss of collaborative session are specified in clause 22;
- procedures for collaborative session media modification are specified in clause 23; and
- procedures for service continuity and MMTEL interactions are specified in clause 24.

Inter-UE transfer procedures are not limited by amount of established sessions.

## 4.2 Underlying network capabilities

Inter-UE transfer assumes the use of a number of underlying network capabilities:

- 1) provision by the home network operator of SCC AS on the IM CN subsystem, as specified in 3GPP TS 24.229 [7].

## 4.3 URI and address assignments

In order to support SC to a subscriber, the following URI and address assignments are assumed:

- a) in this version of the document, the SC UE for inter-UE transfer will be configured with an Inter UE Transfer SCC AS URI. The Inter UE Transfer SCC AS URI is used in the inter UE transfer procedures.

---

# 5 Functional entities

## 5.1 Introduction

This clause associates the functional entities with the inter-UE transfer roles described in the stage 2 architecture document (see 3GPP TS 23.237 [4]).

## 5.2 User Equipment (UE)

If the SC UE supports the Controller UE procedures for IUT transfer then the SC UE may include the g.3gpp.iut-controller media feature tag as described in annex B in the Contact header of SIP requests and SIP responses.

To be compliant with inter-UE transfer in this document, a UE shall implement the role of an SC UE:

- by following the procedures specified in 3GPP TS 24.229 [7] for registration of the UE in the IM CN subsystem; and
- dependent on the desired functionality, one or more of the procedures according to subclause 9.2, subclause 10.2, subclause 11.2, subclause 12.2, subclause 13.2, subclause 14.2, subclause 15.2, subclause 16.2, subclause 17.2, subclause 18.2, subclause 19.2, subclause 20.2, subclause 21.2, subclause 22.2, subclause 23.2 and subclause 24.2.

**NOTE:** In the inter-UE transfer, a session can be collaborative session where there are one controller UE and several controllee UEs. The controllee UE can be a legacy UE and does not have to be compliant with the above subclauses.

## 5.3 Application Server (AS)

To be compliant with inter-UE transfer in this document, an AS shall implement the role of an SCC AS according to subclause 9.3, subclause 10.3, subclause 11.3, subclause 12.3, subclause 13.3, subclause 14.3, subclause 15.3, subclause 16.3, subclause 17.3, subclause 18.3, subclause 19.3, subclause 20.3, subclause 21.3, subclause 22.3, subclause 23.3 and subclause 24.3.



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## 6 Roles for registration in the IM CN subsystem for service continuity

### 6.1 SC UE

The SC UE shall follow the procedures specified in 3GPP TS 24.229 [7] for registration of the UE in the IM CN subsystem.

If the SC UE supports the Controller UE procedures for IUT transfer then the SC UE shall include the g.3gpp.iut-controller media feature tag as described in annex B in the Contact header field of the SIP REGISTER request.

### 6.2 SCC AS

The SCC AS can obtain registration state information that it needs to implement SCC specific requirements from:

- a) any received third-party SIP REGISTER request (e.g. including information contained in the body of the third-party SIP REGISTER request) as specified in 3GPP TS 24.229 [7];
- b) any received reg event package as specified in 3GPP TS 24.229 [7]; or
- c) the Sh interface as specified in 3GPP TS 29.328 [26] and 3GPP TS 29.329 [27].

NOTE: Obtaining registration state information from HSS using Sh interface does not allow the SCC AS to know the capabilities supported by the user registered UE(s), including the used IP-CAN(s).

---

## 7 Roles for General Capabilities

### 7.1 Introduction

This clause describes the general roles for each functional entity as specified.

### 7.2 UE roles

Configuration of user preference criteria for routing incoming session requests to a controller capable UE is specified in subclause 7.3.1 and for controller loss preference is specified in subclause 7.3.2.

### 7.3 AS roles

#### 7.3.1 Configuration of user preference criteria for routing incoming session requests to a controller capable UE

Configuration of user preference criteria by the user should:

- take place over the Ut reference point using XCAP as enabling protocol; or
- use SIP based user configuration as described in 3GPP TS 24.238 [8];

NOTE: Other possibilities for user configuration, such as web-based provisioning or pre-provisioning by the operator are outside the scope of the present document, but are not precluded.

The structure of the XML document and the schema for the user preference criteria is defined in annex C.3

## 7.3.2 Configuration of controller loss preference

Configuration of controller loss preferences by the user should:

- take place over the Ut reference point using XCAP as enabling protocol; or
- use SIP based user configuration as described in 3GPP TS 24.238 [8];

NOTE: Other possibilities for user configuration, such as web-based provisioning or pre-provisioning by the operator are outside the scope of the present document, but are not precluded.

The structure of the XML document and the schema for configuring the list of preferred UEs that are used in the case of controller loss is defined in annex C.3.

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# 8 Roles for call termination for inter UE transfer

## 8.1 Introduction

This clause specifies the procedures for call termination for inter UE transfer. Procedures are specified for the SC UE and the SCC AS.

## 8.2 SC UE

There are no additional procedures for the SC UE over those specified in 3GPP TS 24.229 [7].

## 8.3 SCC AS

### 8.3.1 Routing incoming session requests to a controller capable UE

When the SCC AS receives an incoming initial session establishment request it checks the request against the following stored user preference criteria to see if collaborative sessions are enabled for this session:

- URI in the P-Asserted-Identity header field;
- URI in the Request-URI;
- any ICSI value in the P-Asserted-Service header field; and
- media types in the SDP offer.

If the stored user preference criteria indicates that collaborative sessions are enabled for this session then the SCC AS shall include the media feature tag `g.3gpp.iut-controller` along with the explicit parameter in an Accept-Contact header field in the request before forwarding.

---

# 9 Roles for UE discovery for inter-UE transfer

## 9.1 Introduction

This clause specifies the target UE discovery procedures for UEs that are candidate UEs for inter UE transfer. The list of candidate UEs is a contact list such as name of the UE, which is represented in SIP through the use of SIP contact or the instance-id. The subscription of candidate UEs may be configured such that the private user identities associated with the UEs involved in inter UE transfer share the same set of implicitly registered public user identities.

## 9.2 SC UE

The target UE discovery procedures include the registration status (active, inactive), and the UE capabilities (e.g. support of audio/video formats, Controller UE capability, etc.).

In order to determine a list of UEs sharing the same set of implicitly registered public user identities and their capability information, the SC UE subscribes to the reg-event package as described in 3GPP TS 24.229 [7] in subclause 5.1.1.3.

NOTE 1: In order to allow inter UE transfer to UEs belonging to the same user subscription but belonging to a different set of implicitly registered public user identities, a user can have a static list of UEs that is manually administered by the user and stored locally in the user's device (e.g. phone book). Having a static list is an implementation in the UE and has no impact on the standards.

NOTE 2: If the UE is not part of the same set of implicitly registered public user identities as the SC UE, or if the SC UE was unable to obtain the capability information of the UE through the use of reg-event package, the SC UE can send a SIP OPTIONS request to the UE to attempt to retrieve capability information. In order to avoid a lot of transactions, a SIP OPTIONS request is generated based on an action initiated by the user (e.g. after the user has finished adding a new UE in the static list, or the user explicitly asks for getting UE capability information).

## 9.3 SCC AS

The information of UEs that belong to the same subscription is required at the SCC AS for the purpose of authorizing that the requested inter UE transfer to the UE is allowed, i.e. to prevent the SC UE from performing Inter UE Transfer to a UE with a different user subscription.

The SCC AS obtains all the public user identities associated with the user's subscription from the Sh interface as specified in 3GPP TS 29.328 [26] and 3GPP TS 29.329 [27].

NOTE 1: Getting the public user identities over the Sh interface allows the SCC AS to receive information of UEs sharing the same set of implicitly registered public user identities and information of UEs within the same user subscription that are not in the same set of implicitly registered public user identities. This is needed to authorize the static list of UEs that is manually administered by the user and stored locally in the user's device.

The SCC AS can obtain the registration information (e.g. GRUU) by the following methods:

1. using the 3rd-party SIP REGISTER request as described in 3GPP TS 24.229 [7] in subclause 5.4.1.7; or
2. the SCC AS subscribes to the reg-event package as described in 3GPP TS 24.229 [7] in subclause 5.4.2.1.1.

NOTE 2: The SCC AS needs to know the public user identity for the authorization of the SIP REFER request for inter UE transfer. To get the public user identity from the public GRUU, the SCC AS can simply remove the "gr" parameter from the public GRUU. Using the 3rd-party registration or subscribing to the reg-event package allows the SCC AS to find the temporary GRUU of the UE and to correlate the GRUU with the public user identities. After correlation, the SCC AS would make a list of GRUUs that are associated with the same subscription and/or with the same set of implicitly registered public user identities.

---

# 10 Roles for inter-UE transfer without establishment of collaborative session

## 10.1 Introduction

This clause specifies the procedures for transferring all media of an existing session from one UE to another UE of the same subscriber. Procedures are specified for the SC UE and the SCC AS.

## 10.1A General

A UE shall implement dependent on the desired functionality, one or more of the following:

- subclause 10.2.1.1 and subclause 10.2.2.1;
- subclause 10.2.1.2 and subclause 10.2.2.1A; or
- subclause 10.2.2.2.

## 10.2 SC UE

### 10.2.1 SC UE participating in the session to be transferred

#### 10.2.1.1 Transferor SC UE in services defining only originating session set up in UE

In order to transfer all media of an existing session from this SC UE to another UE that shares the same user subscription, the SC UE shall send a SIP REFER request as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] and IETF RFC 7647 [54], and in accordance with UE procedures specified in 3GPP TS 24.229 [7]. The SC UE shall populate the SIP REFER request as follows:

1. the Request-URI set to the URI of the UE where the session is to be transferred to;

NOTE: The URI of the UE needs to be a GRUU if several UEs share the same public user identity.

2. the Refer-To header field set to the Inter UE Transfer SCC AS URI and extended with the following URI header fields:

A. if usage of SIP Replaces extension is selected:

- a. the Replaces header field populated as specified in IETF RFC 3891 [35], containing the dialog identifier of the Access Leg between this UE and the SCC AS; and
- b. the Require header field populated with the option tag value "replaces";

B. if usage of SIP Target-Dialog extension is selected:

- a. the Target-Dialog header field populated as specified in IETF RFC 4538 [40], containing the dialog identifier of the Access Leg between this UE and the SCC AS; and
- b. the Require header field populated with the option tag value "tdialog"; and

C. if the session is established using an IMS communication service that requires the use of an IMS communication service identifier:

- a. optionally the Accept-Contact header field with the g.3gpp.icsi-ref media feature tag containing the IMS communication service identifier of the existing session; and
- b. the P-Preferred-Service header field set to the IMS communication service identifier of the existing session; and

3. the Contact header field: including a public GRUU or temporary GRUU as specified in 3GPP TS 24.229 [7].

If the SC UE receives any SIP 4xx, SIP 5xx, or SIP 6xx response to the SIP REFER request or if the SC UE receives a SIP NOTIFY request containing a message/sipfrag body of any SIP 4xx, SIP 5xx or SIP 6xx response, then the inter UE transfer has not completed successfully.

#### 10.2.1.2 Transferor SC UE in services defining terminating session set up in UE

In order to transfer all media of an existing session from this SC UE to another UE that shares the same user subscription, the SC UE shall send a SIP REFER request as specified in IETF RFC 3515 [32] as updated by

RFC 6665 [48] and IETF RFC 7647 [54], in accordance with UE procedures specified in 3GPP TS 24.229 [7]. The SC UE shall populate the SIP REFER request as follows:

1. the Request-URI set to the Inter UE Transfer SCC AS URI;
2. the Refer-To header field set to the SIP URI of the UE where the session is to be transferred to and if the session is established using an IMS communication service that requires the use of an IMS communication service identifier, the SIP URI may be extended with the following URI header fields:

NOTE: The SIP URI of the UE needs to be a GRUU if several UEs share the same public user identity.

- A. optionally the Accept-Contact header field with the g.3gpp.icsi-ref media feature tag containing the IMS communication service identifier of the existing session; and
  - B. the P-Preferred-Service header field set to the IMS communication service identifier of the existing session;
3. the Accept header field containing the MIME type "message/sipfrag";
  4. the Target-Dialog header field containing the dialog parameters for the dialog of the existing session; and
  5. the Referred-By header field containing a currently registered public user identity of the SC UE participating in the session to be transferred.

If the SC UE receives any SIP 4xx, SIP 5xx, or SIP 6xx response to the SIP REFER request or if the SC UE receives a SIP NOTIFY request containing a message/sipfrag body of any SIP 4xx, SIP 5xx or SIP 6xx response, then the inter UE transfer has not completed successfully.

## 10.2.2 SC UE not participating in the session to be transferred

### 10.2.2.1 Transferee SC UE in services defining only originating session set up in UE

When sending a SIP INVITE request upon SIP REFER request reception in accordance with UE procedures specified in 3GPP TS 24.229 [7] and IETF RFC 3515 [32] as updated by RFC 6665 [48] IETF RFC 7647 [54], the SC UE shall populate the SIP INVITE request with header fields which were included as URI header fields in the URI in the Refer-To header field of the received SIP REFER request.

#### 10.2.2.1A Transferee SC UE in services defining terminating session set up in UE

There are no specific procedures for the transferee SC UE in services defining terminating session set up in UE, besides the procedures described in 3GPP TS 24.229 [7].

### 10.2.2.2 Inter UE transfer triggered by SC UE not participating in the session

In order to transfer all media streams of an existing session of another UE to the SC UE, the SC UE shall send a SIP INVITE request as specified in 3GPP TS 24.229 [7]. The SC UE shall populate the SIP INVITE request as follows:

1. the Request-URI set to the Inter UE Transfer SCC AS URI;
2. the Replaces header field containing the dialog identifier of the session to be transferred; and
3. the Require header field containing the option tag value "replaces".

## 10.3 SCC AS

### 10.3.1 Distinction of requests sent to the SCC AS

The SCC AS needs to distinguish between the following SIP requests to provide specific functionality relating to inter UE transfer:

1. SIP INVITE request routed to the SCC AS upon originating or terminating filter criteria containing the Inter UE Transfer SCC AS URI in the Request-URI and a STI belonging to the same user subscription in:

- A. the Target-Dialog header field; or
- B. in the Replaces header field

with at least one offered media type used in session by a UE other than the UE identified by the Contact header field value. Then in the procedures below, such a request is known as "SIP INVITE request due to inter UE transfer".

2. SIP REFER request routed to the SCC AS due to the originating filter criteria where:
  - A. the GRUU in the Contact header field identifies a UE of the user identified in P-Asserted-Identity header field;
  - B. the GRUU in the Contact header field identifies a UE of the same user subscription as the SIP URI in the Request-URI;
  - C. the dialog identifier in:
    - a. the Replaces URI header field of the URI in the Refer-To header field; or
    - b. the Target-Dialog URI header field of the URI in the Refer-To header field;belongs to a session of the UE identified by the GRUU in the Contact header field; and
  - D. the Refer-To header field contains the Inter UE Transfer SCC AS URI either without method parameter or with method parameter set to "INVITE".

Then in the procedures below, such a request is known as "SIP REFER request due to inter UE transfer".

Other SIP initial requests for a dialog and requests for a SIP standalone transaction can be dealt with in any manner conformant with 3GPP TS 24.229 [7].

### 10.3.2 Inter UE transfer request authorization in services defining only originating session set up in UE

Upon receiving a SIP REFER requests due to inter UE transfer, the SCC AS shall:

1. reject the SIP request with a SIP 403 (Forbidden) response and do not process the remaining steps if:
  - A. the media streams of the session, one leg of which is identified by the dialog identifier in:
    - a. the Replaces URI header field of the URI in the Refer-To header field; or
    - b. the Target-Dialog URI header field of the URI in the Refer-To header field;are delivered to two or more UEs of the same user subscription; or
  - B. at least one media stream of the session identified by the dialog identifier in:
    - a. the Replaces URI header field of the URI in the Refer-To header field; or
    - b. the Target-Dialog URI header field of the URI in the Refer-To header fieldis delivered to a UE other than the UE identified by the GRUU in the Contact header field;
2. insert a Record-Route header field with SCC AS own address; and
3. forward the SIP REFER request in any manner conformant with 3GPP TS 24.229 [7].

The SCC AS shall forward the SIP response to the SIP REFER request, the associated SIP NOTIFY request, and the SIP response to the NOTIFY request conformant with 3GPP TS 24.229 [7].

### 10.3.3 SCC AS procedures for inter UE transfer

#### 10.3.3.1 Procedures for inter-UE transfer in services defining only originating session set up in UE

Upon receiving a SIP INVITE request due to inter UE transfer, the SCC AS shall:

1. if:
  - A. the SCC AS is not aware of a subscription created by a SIP REFER request with the dialog identifiers:
    - a. in the Replaces header field of the received SIP INVITE request and in the Replaces URI header field of the URI in the Refer-To header field of the SIP REFER request are equal; or
    - b. in the Target-Dialog header field of the received SIP INVITE request and in the Target-Dialog URI header field of the URI in the Refer-To header field of the SIP REFER request are equal; and
  - B. the SCC AS does not authorize the request on behalf of the served user participating in the session indicated in the Replaces header field;then reject the SIP request with a SIP 403 (Forbidden) response and do not process the remaining steps;
2. associate the received SIP INVITE request with an ongoing SIP dialog by matching the dialog identifier in the Replaces header field or the Target-Dialog header field. By an ongoing SIP dialog, it is meant a dialog for which a SIP 2xx response to the initial SIP INVITE request has been sent or received;
3. if a dialog identifier is not included in either in the Replaces header field or in the Target-Dialog header field or if the included dialog identifier does not identify an existing ongoing dialog, send a SIP 480 (Temporarily Unavailable) response to reject the SIP INVITE request and not processes the remaining steps;
4. identify the Source Access Leg by the dialog identifier present in the Replaces or the Target-Dialog header field of the SIP INVITE request;
5. if a media type used in the Source Access Leg session is not offered in the SDP offer of the SIP INVITE request then reject the SIP request with a SIP 403 (Forbidden) response and do not process the remaining steps;
6. if the SIP INVITE request contains a Replaces header field:
  - A. follow the procedures defined in IETF RFC 3891 [35] for replacing the Source Access Leg with the SIP request received on the Target Access Leg, including terminating the Source Access Leg by sending a SIP BYE towards the SC UE in accordance with 3GPP TS 24.229 [7]; and
7. send a SIP re-INVITE request towards the remote UE using the existing established dialog. The SCC AS shall populate the SIP re-INVITE request as follows:
  - A. include a new SDP offer including the media characteristics as received in the SIP INVITE request, by following the rules of the 3GPP TS 24.229 [7]; and
  - B. set the Contact header field to the Contact header field value received in the SIP INVITE request.

Upon receiving the SIP ACK request originated from the SC UE, the SCC AS shall initiate release of the Source Access Leg by sending a SIP BYE towards the SC UE in accordance with 3GPP TS 24.229 [7].

#### 10.3.3.2 Procedures for inter-UE transfer in services defining terminating session set up in UE

Upon receiving a SIP REFER request in SCC AS for transferring all media of an existing session from the SC UE to another UE that shares the same user subscription, the SCC AS shall send:

- 1) a SIP 200 (OK) response to the SIP REFER request and a SIP NOTIFY request containing a sipfrag "SIP 100 Trying" to the controller UE as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48]; and
- 2) a SIP INVITE request to the SIP URI of the UE where the session is to be transferred to, containing:

- a) Request-URI with SIP URI from the Refer-To header field of the received SIP REFER request;
- b) the Referred-By header field containing the values from the Referred-By header field of the received SIP REFER request according to the procedures of IETF RFC 3892 [36];
- c) the P-Asserted-Identity header field containing the identity of the remote UE as received in the P-Asserted-Identity header field from the remote UE at the original session establishment; and
- d) the SDP information containing the information as received during the last successful SDP offer/answer exchange from the remote UE.

If the SIP final response was a non 2xx response then the SCC AS shall consider the transfer operation failed and abort the inter UE transfer and continue the existing session prior to the failed transfer attempt.

If the SIP final response was a SIP 2xx response containing a SDP answer, the SCC AS shall send a SIP re-INVITE request on the dialog for the remote leg to the remote UE as specified in 3GPP TS 24.229 [7]. The SCC AS shall send a SIP re-INVITE request including the SDP information as from the SDP answer received in the SIP 200 (OK) response;

Upon receiving a SIP 200 (OK) response on the remote leg, the SCC AS shall:

- 1) send a SIP ACK request to the remote UE and to the transferee UE;
- 2) initiate release of the original access leg by sending a SIP BYE towards the transferor SC UE in accordance with 3GPP TS 24.229; and
- 3) send, a SIP NOTIFY request containing the received final response code in the sipfrag body to the transferor UE.

### 10.3.3.3 Procedures for inter-UE transfer triggered by SC UE not participating in the session

The SCC AS procedures for inter UE transfer triggered by SC UE not participating in the session is the same as the procedure described in subclause 10.3.3.1.

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## 11 Roles for collaborative session establishment for inter-UE transfer

### 11.1 Introduction

This clause specifies the roles of controller UE, controllee UE and the SCC AS when controller UE transfers media used in an existing session to a controllee UE or adds a new media to an existing session on the controllee UE.

### 11.2 SC UE

#### 11.2.1 SC UE procedures for collaborative session establishment by transferring media used in an existing session

##### 11.2.1.1 Controller UE procedures

To establish a collaborative session by transferring one or more media components, the controller UE shall send a SIP REFER request outside the existing dialog as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] and IETF RFC 7647 [54], and include:

- 1) the Request-URI set to the Inter UE Transfer SCC AS URI;
- 2) the Refer-To header field set as follows:
  - a) the SIP URI of the controllee UE;



NOTE: The SIP URI of the controllee UE needs to be a GRUU if the controllee UE and any other UEs share the same public user identity.

- b) the SIP URI additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session set as follows:
    - media lines that are not being transferred with the port number set to zero;
    - media line(s) that are to be transferred containing the port number for the corresponding media types received in the media line of the SDP received during the last successful SDP offer/answer exchange; and
  - c) if the controller UE also wishes to transfer control of the collaborative session to the controllee UE then the SIP URI additionally containing the XML body specified for the Refer-To URI in subclause 18.2.1;
- 3) the Accept header field containing the MIME type "message/sipfrag";
  - 4) the Target-Dialog header field containing the dialog parameters for the dialog of the existing session
  - 5) the Contact header field containing:
    - the g.3gpp.iut-controller media feature tag as described in annex B; and
    - the g.3gpp.current-iut-controller media feature tag as described in annex C set to "passive" if the controller UE does not wish to be the controller of the collaborative session; and
  - 6) the Referred-By header field containing a currently registered public user identity of the user to be delivered to the controllee UE.

The controller UE shall handle any response to the SIP REFER request and the subsequent SIP NOTIFY requests according to 3GPP TS 24.229 [7] and IETF RFC 3515 [32] as updated by RFC 6665 [48]. The controller UE shall save the media information (i.e. media type(s) and port number(s)) related to the transferred media component(s) received in the sipfrag body of the SIP NOTIFY requests in order to perform further inter-UE transfer operations on the controllee UE. When the controller UE receives a SIP re-INVITE request from the SCC AS to update the status of the transferred media component after a successful transfer, the controller UE shall follow the procedures described in 3GPP TS 24.229 [7], including in the Contact header field of the SIP 200 (OK) response the g.3gpp.iut-controller media feature tag as described in annex B.

If an error response is received for the SIP REFER request or the subsequent SIP NOTIFY requests include a non-2xx final response, the controller UE shall consider the transfer operation failed and continue the existing session with media components prior to the failed transfer attempt.

### 11.2.1.2 Controllee UE procedures

There are no specific procedures for the controllee UE for the collaborative session establishment by transferring media, besides the procedures described in 3GPP TS 24.229 [7].

## 11.2.2 SC UE procedures for collaborative session establishment with new media

### 11.2.2.1 Controller UE procedures

The controller UE may establish a collaborative session with a new media at anytime while it has an ongoing IMS established session according to 3GPP TS 24.229 [7] with a remote UE.

The controller UE shall add the new media by sending a SIP REFER request outside the existing dialog as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] and IETF RFC 7647 [54], and include:

- 1) the Request-URI set to the Inter UE Transfer SCC AS URI;
- 2) the Refer-To header field set as follows:
  - a) the SIP URI of the controllee UE;

NOTE 1: The SIP URI of the controllee UE needs to be a GRUU if the controllee UE and other UEs share the same public user identity.

b) the SIP URI additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session set as follows:

- media lines that are not being transferred with the port number set to zero;
- media line(s) that are to be added containing the media type(s) to be added and the discard port number "9"; and

NOTE 2: The discard port number "9" indicates that this port number should be ignored.

c) if the controller UE also wishes to transfer control of the collaborative session to the controller UE then the SIP URI additionally containing the XML body specified for the Refer-To URI in subclause 18.2.1;

3) the Accept header field containing the MIME type "message/sipfrag";

4) the Target-Dialog header field containing the dialog parameters for the dialog of the existing session

5) the Contact header field containing:

- the g.3gpp.iut-controller media feature tag as described in annex C; and
- the g.3gpp.current-iut-controller media feature tag as described in annex C set to "passive" if the controller UE does not wish to be the controller of the collaborative session; and

6) the Referred-By header field containing a currently registered public user identity of the user to be delivered to the controllee UE.

The controller UE shall handle any response to the SIP REFER request and the subsequent SIP NOTIFY requests according to 3GPP TS 24.229 [7] and IETF RFC 3515 [32] as updated by RFC 6665 [48]. The controller UE shall save the media information (i.e. media type(s) and port number(s)) received in the sipfrag body of the SIP NOTIFY requests in order to perform further inter-UE transfer operations on the controllee UE.

If error response is received for the SIP REFER request or the subsequent SIP NOTIFY requests include a non-2xx final response, the controller UE shall consider the transfer operation failed and continue the existing session with media components prior to the failed transfer attempt.

The controller UE may also receive SIP NOTIFY requests as the results from the SIP SUBSCRIBE request to the dialog event package between itself and the SCC AS as described in clause 15. The controller UE shall save the media information (i.e. media type(s) and port number(s)) received in the body of the SIP NOTIFY requests in order to perform further inter-UE transfer operations on the controllee UE.

### 11.2.2.2 Controllee UE procedures

There are no specific procedures for the controllee UE for the collaborative session establishment by adding media, besides the procedures described in 3GPP TS 24.229 [7].

## 11.3 SCC AS

### 11.3.1 Distinction of requests sent to the SCC AS

The SCC AS needs to distinguish between the following initial SIP REFER requests to provide specific functionality relating to the call origination:

1) SIP REFER requests routed to the SCC AS containing:

- a) the Inter UE Transfer SCC AS URI in the Request-URI;
- b) the Target-Dialog header field with dialog identifier identifying an existing session owned by the UE sending the SIP REFER request; and
- c) the Refer-To header field containing a SIP URI:

- i) of a UE which is neither the UE which sent the SIP REFER request, nor the remote UE, but which is within the list of UEs which can be involved within an collaborative session with the UE which originated the SIP REFER request;
- ii) with the SIP URI containing the URI header field with the hname "body" containing SDP for the media lines with media types for at least all the media components of the existing session with one or more media lines not used in the existing session and indicated with the discard port value 9; and
- iii) without method parameter or with method parameter set to "INVITE".

In the procedures below, such SIP REFER requests are called "SIP REFER requests for establishing new media at controllee UE".

NOTE 1: It is assumed that the SCC AS is the first AS that the S-CSCF forwards the request to after receiving the request from the UE.

2) SIP REFER requests routed to the SCC AS containing:

- a) the Inter UE Transfer SCC AS URI in the Request-URI;
- b) the Target-Dialog header field with dialog identifier identifying an existing session owned by the UE sending the SIP REFER request; and
- c) the Refer-To header field containing a SIP URI:
  - i) of a UE which is neither the UE which sent the SIP REFER request, nor the remote UE, but which is within the list of UEs which can be involved within an collaborative session with the UE which originated the SIP REFER request;
  - ii) with the hname "body" URI header field containing SDP for the media lines with media types for all the media components of the existing session with one or more media lines used in the existing session and listed with non zero port value; and
  - iii) without method parameter or with method parameter set to "INVITE".

In the procedures below, such SIP REFER requests are called "SIP REFER requests for transferring an existing media to controllee UE".

NOTE 2: It is assumed that the SCC AS is the first AS that the S-CSCF forwards the request to after receiving the request from the UE.

If a SIP REFER request contains the Contact header field the media feature tag `g.3gpp-current-iut-controller` set to "passive" and the SIP URI in the Refer-To header field contains the XML specified in annex D.3 containing a `<controlTransfer>` element containing a `<targetController>` element then in the procedures below, such SIP REFER requests are called "SIP REFER requests for transferring control of the collaborative session".

Other SIP initial requests for a dialog, and requests for a SIP standalone transaction are handled conformant with 3GPP TS 24.229 [7].

### 11.3.2 SCC AS procedures for collaborative session establishment by transferring media

NOTE: If the controller UE is already involved in a collaborative session then the procedures in subclause 12.3.1 apply.

When the SCC AS establishes a collaborative session by transferring media as a result of receiving a SIP REFER request for transferring an existing media type to a controllee UE from the controller UE, the SCC AS shall send:

- 1) a SIP 200 (OK) response to the SIP REFER request and a SIP NOTIFY request containing a sipfrag "SIP 100 Trying" to the controller UE as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48]; and
- 2) a SIP INVITE request to controllee UE, containing:
  - a) Request-URI with SIP URI from the Refer-To header field of the received SIP REFER request;

- b) the Referred-By header field containing the values from the Referred-By header field of the received SIP REFER request according to the procedures of IETF RFC 3892 [36];
- c) the P-Asserted-Identity header field containing the identity of the remote UE as received in the P-Asserted-Identity header field from the remote UE at the original session establishment; and
- d) the SDP information for the media component to be transferred as follows:
  - A) The media type(s) from the media (m=) lines from the hname "body" URI header field in the SIP URI in the Refer-To header field of the received SIP REFER request; and
  - B) for media lines which have non zero port numbers the SDP parameters from the corresponding media lines as received during the last successful SDP offer/answer exchange from the remote UE and extended with
    - i) sendonly directionality; and
    - ii) bandwidth information with RS set to zero and RR set to zero.

If the SIP final response was a non 2xx response then the SCC AS shall consider the transfer operation failed and abort the media transfer and establishment of the collaborative session and continue the existing session with media components prior to the failed transfer attempt.

If the SIP final response was a SIP 2xx response containing a SDP answer, the SCC AS shall send a SIP re-INVITE request on the dialog for the remote leg to the remote UE as specified in 3GPP TS 24.229 [7]. The SCC AS shall:

- 1) send a SIP re-INVITE request containing SDP information as follows:
  - a) for the transferred media component(s), set the SDP information as from the SDP answer received in the SIP 200 (OK) response from the controllee UE with the difference that the directionality is set to directionality used by the controller UE; and
  - b) for all other media components in the collaborative session, include the SDP information as from the original session to the remote leg.

Upon receipt of a 2xx response for the re-INVITE request sent to the remote UE, the SCC AS shall:

- 1) send a SIP re-INVITE request to the controller UE following the procedures described in 3GPP TS 24.229 [7] to remove the media for the transferred media component.

Upon receiving a SIP 200 (OK) response with the SDP answer on the remote leg, the SCC AS shall send a SIP ACK request on the remote leg.

Upon receipt of a 2xx response for the re-INVITE request sent to the controller UE, the SCC AS shall send a SIP re-INVITE request to the controllee UE following the procedures described in 3GPP TS 24.229 [7] and set the directionality (i.e. sendrecv/sendonly/recvonly/inactive) attributes associated to the transferred media component to according to the SDP answer received from the remote UE.

Upon receiving a final response to the SIP re-INVITE request which was sent towards the controllee UE to set the directionality attributes associated to the transferred media component, the SCC AS shall:

- 1) send a SIP NOTIFY request containing the received final response code in the sipfrag body to the controller UE;
- 2) if the received response to the SIP re-INVITE is a SIP 2xx response containing an SDP answer, then include within the sipfrag body
  - a) the Content-Type header field from the received SIP 2xx response; and
  - b) the SDP answer received in the SIP 2xx response.

### 11.3.3 SCC AS procedures for collaborative session establishment with new media

When SCC AS receives a SIP REFER request in a new dialog from the controller UE for establishing a collaborative session by adding new media to the controllee UE, the SCC AS shall send:

- 1) a SIP 200 (OK) response to the controller UE;
- 2) a SIP NOTIFY request containing a sipfrag "SIP 100 Trying" as described in IETF RFC 3515 [32] as updated by RFC 6665 [48] to the controller UE; and
- 3) a SIP INVITE request in accordance to 3GPP TS 24.229 [7] to the controllee UE. The SCC AS shall construct the SIP INVITE request as follows:
  - a) Request-URI set to the SIP URI from the Refer-To header field of the received SIP REFER request;
  - b) the Referred-By header field containing the values from Referred-By header field of the received SIP REFER request if authorized by SCC AS, according to the procedures of the IETF RFC 3892 [36];
  - c) the P-Asserted-Identity header field containing the identity of the remote UE as received in the P-Asserted-Identity header field from the remote UE at the original session establishment; and
  - d) includes an SDP offer:
    - A) with the media type(s) from the media (m=) lines in the same order as in the hname "body" URI header field of the SIP URI in the Refer-To header field of the received SIP REFER request;
    - B) with port numbers of the media line(s) set to zero except the media line(s) of the new media, i.e. the media line(s):
      - i) which were listed in the received SDP of the SIP REFER request with the discard port number "9"; and
      - ii) which are not used yet in the session; and
    - C) for the media line(s) containing the media type(s) of the new media component(s) with additional SDP fields containing:
      - i) sendonly directionality;
      - ii) bandwidth information with RS set to zero and RR set to zero; and
      - iii) a c-line set to the unspecified address (0.0.0.0) if IPv4 or a domain name within the ".invalid" DNS top-level domain in case of IPv6 as described in IETF RFC 6157 [43].

If a SIP non-2xx final response is received from the controllee UE, the SCC AS shall send a SIP NOTIFY request including the SIP final response as a sipfrag body to the controller UE and consider the inter-UE transfer operation failed. Otherwise, the SCC AS continues with the remainder of the steps described in this subclause.

Upon receiving a SIP 2xx response from the controllee UE with an SDP answer, the SCC AS shall send a SIP re-INVITE request to the remote UE as specified in 3GPP TS 24.229 [7]. The SCC AS shall construct the SDP offer in the SIP re-INVITE request as follows:

- 1) the SDP information as follows:
  - a) for the added media component(s), set the SDP information as from the SDP answer received in the SIP 200 (OK) response from the controllee UE with the difference that the directionality is set to sendrecv directionality; and
  - b) for all other media components in the collaborative session, include the SDP information as from the original session to the remote leg.

If the SIP final response was a non 2xx response then the SCC AS shall consider the transfer operation failed and abort the media transfer and establishment of the collaborative session.

If the SIP final response from the remote UE was a SIP 2xx response with the SDP answer, the SCC AS shall:

- 1) send to the remote UE a SIP ACK request; and
- 2) send to the controllee UE a SIP re-INVITE request containing the current port number for the media component to be added and set the directionality (i.e. sendrecv/sendonly/recvonly/inactive) attributes associated to the transferred media component to according to the SDP answer received from the remote UE.

NOTE 0: This SIP re-INVITE request is triggered by the SIP REFER request. The previous SIP INVITE request was generated by the SCC AS due to third party call control to allow sending this SIP re-INVITE request.

NOTE 1: Any other changes such as IP address of the remote leg in case remote leg uses different IP addresses for different media components can also be updated in the SIP re-INVITE request.

Upon successful completion of the SDP offer answer exchange using SIP re-INVITE request with the controllee UE, the SCC AS shall:

- 1) send to the controllee UE a SIP ACK request

Upon receiving a SIP final response from the controllee UE, the SCC AS shall send, a SIP NOTIFY request containing the received final response code in the sipfrag body to the controller UE and if the received response was a SIP 200 (OK) response containing an SDP answer then also include in the sipfrag the Content-Type header field from the received 200 (OK) response along with the media (m=) line(s) from the SDP answer.

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## 12 Roles for media transfer within collaborative session for inter-UE transfer

### 12.1 Introduction

This clause specifies the roles of the controller UE, the controllee UE and the SCC AS when media transfer from the controller UE to a controllee UE or from a controllee UE to another controllee UE within a collaborative session.

### 12.2 SC UE

#### 12.2.1 Procedures for controller UE initiated media transfer from controller UE to controllee UE

##### 12.2.1.1 Controller UE procedures

The SC UE procedures for media transfer from controller UE to a controllee UE is the same as the procedures described in subclause 11.2.1.1 with exception that the controller UE sets the port numbers for the media types of the media components (in the hname "body" URI header field from the SIP URI in the Refer-To header field of the SIP REFER request) which are being transferred to the controllee UE to values from the corresponding media lines received during the last successful SDP offer and answer exchange with the remote party.

##### 12.2.1.2 Controllee UE procedures

There are no specific procedures for the controllee UE for media transfer from controller UE to controllee, besides the procedures described in 3GPP TS 24.229 [7].

#### 12.2.2 Procedures for controller UE initiated media transfer from controllee UE to another controllee UE

##### 12.2.2.1 Controller UE procedures

To transfer a media component within a collaborative session from one controllee UE to another controllee UE, the controller UE shall send a SIP REFER request outside the existing dialog as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] and IETF RFC 7647 [54] and include:

- 1) the Request-URI set to the Inter UE Transfer SCC AS;
- 2) the Refer-To header field set as follows:

- a) the SIP URI of the controllee UE to which the media m-lines are to be transferred; and

NOTE: The SIP URI of the controllee UE needs to be a GRUU if the controllee UE and any other UEs share the same public user identity.

- b) the SIP URI additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session set as follows:
- media lines which are not served by the target controllee UE and which are not being transferred with the port numbers set to zero;
  - media lines which are already served by the target controllee UE, therefore are not to be transferred containing the port numbers of the remote UE; and
  - media line(s) which are to be transferred containing the port numbers of the remote UE; and
- c) if the controller UE also wishes to transfer control of the collaborative session to the target controllee UE then the SIP URI additionally containing the XML body specified for the Refer-To URI in subclause 18.2.1;
- 3) the Accept header field containing the MIME type "message/sipfrag";
- 4) the Target-Dialog header field containing the dialog parameters for the dialog of the collaborative session;
- 5) the Referred-By header field containing a currently registered public user identity of the user to be delivered to the controllee UE; and
- 6) the Contact header field containing:
- the g.3gpp.iut-controller media feature tag as described in annex C; and
  - the g.3gpp.current-iut-controller media feature tag as described in annex C set to "passive" if the controller UE does not wish to remain the controller of the collaborative session.

The controller UE shall handle the subsequent SIP NOTIFY requests to the SIP REFER request according to 3GPP TS 24.229 [7], IETF RFC 3515 [32] as updated by RFC 6665 [48].

The controller UE shall save the media information (i.e. media types(s) and port number(s)) related to the media component(s) received in the sipfrag body of the SIP NOTIFY requests in order to perform further inter-UE transfer operations on the controllee UE.

If an error response is received for the SIP REFER request or the subsequent SIP NOTIFY requests include a non-2xx final response, the controller UE shall consider the transfer operation failed and continue the existing session with media components prior to the failed transfer attempt.

### 12.2.2.2 Controllee UE procedures

There are no specific procedures for the controllee UE for transferring media form one controllee UE to another controllee UE, besides the procedures described in 3GPP TS 24.229 [7].

## 12.3 SCC AS

### 12.3.1 Procedures for controller UE initiated media transfer from controller UE to controllee UE

The SCC AS procedures for media transfer from the controller UE to a controllee UE is the same as the procedures described in subclause 11.3.2 with the exception that upon receipt of a SIP REFER request from the controller UE the SCC AS sends a SIP re-INVITE request instead of a SIP INVITE request to the controllee UE. The SIP re-INVITE request is within the dialog established when establishing the collaborative session with the controllee UE.

### 12.3.2 Procedures for controller UE initiated media transfer from controllee UE to another controllee UE

When the SCC AS maintaining a collaborative session and transferring media as a result of receiving a SIP REFER request for transferring one or more media components from one controllee UE to another controllee UE, the SCC AS shall send:

- 1) a SIP 200 (OK) response to the SIP REFER request and a SIP NOTIFY request containing a sipfrag "SIP 100 Trying" to the controller UE as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] for the dialog on which the SIP REFER request was received; and
- 2) a SIP re-INVITE request to controllee UE, to which the media component(s) is to be transferred, containing the SDP information for the media component to be transferred as follows:
  - a) the media type(s) from the media (m=) lines from the hname "body" URI header field from the SIP URI in the Refer-To header field of the received SIP REFER request including the associated attributes (a) set to sendonly and the associated bandwidth information (b) with RS set to zero and RR set to zero for those media components which are to be transferred to the target controllee UE; and
  - b) for media lines which have non zero port numbers the SDP parameters from the corresponding media lines as received during the last successful SDP offer-answer exchange from the remote UE.

Upon receipt of a 2xx response for the re-INVITE request sent to the controllee UE to which the media component is to be transferred, the SCC AS shall:

- 1) send a SIP re-INVITE request to controllee UE, from which the media component(s) is to be transferred, containing the SDP information for the media component to be transferred as follows
  - a) the media type(s) from the media (m=) lines from the hname "body" URI header field from the SIP URI in the Refer-To header field of the received SIP REFER request including the associated attributes (a) set to sendonly and the associated bandwidth information (b) with RS set to zero and RR set to zero for those media components which are to be transferred to the target controllee UE; and
  - b) for media line(s) which have non zero port numbers the SDP parameters from the corresponding media lines as received during the last successful SDP offer-answer exchange from the remote UE; and
- 2) the Referred-By header field containing the values from the Referred-By header field of the received SIP REFER request according to the procedures of IETF RFC 3892 [36].

NOTE 1: This SIP re-INVITE request is triggered by the SIP REFER request. The previous SIP INVITE request was generated by the SCC AS due to third party call control to allow sending this SIP re-INVITE request.

If a 2xx response was received to the re-INVITE request sent to the controllee UE from which the media component(s) is to be transferred, the SCC AS shall send a SIP re-INVITE request to the remote UE containing an SDP body as follows:

- 1) for the transferred media component(s), set the SDP information as received from the SDP answer in the SIP 2xx response from the controllee UE to which the media component is to be transferred with the difference that the attributes (a) is set to directionality used by the controllee UE from which the media component was transferred;
- 2) for all other media components in the collaborative session, include the associated media line(s) as from the original session to the remote leg.

Upon receipt of a 2xx response for the re-INVITE request sent to the remote UE, the SCC AS shall:

- 1) if the transferred media component was the only media component active at the controllee UE from which the media component was transferred from, send a SIP BYE request to the controllee UE from which the media component was transferred from; or
- 2) if after the transfer of the media component the controllee UE from which the media was transferred from still has other media components within the collaborative session, send a SIP re-INVITE request to the controllee UE, from which the media component was transferred, following the procedures described in 3GPP TS 24.229 [7] and set the port value of the associated media type(s) for the transferred media to zero.



Upon receipt of a 2xx response for the re-INVITE request or the SIP BYE request sent to the controllee UE from which the media component was transferred the SCC AS shall send a SIP re-INVITE request to the controllee UE to which the media component was transferred following the procedures described in 3GPP TS 24.229 [7] and set the directionality (i.e. sendrecv/sendonly/recvonly/inactive) attributes associated to the transferred media component to according to the SDP answer received from the remote UE.

Upon receiving a final response to the SIP re-INVITE request which was sent towards the controllee UE to set the directionality attributes associated to the transferred media component, the SCC AS shall:

- 1) send a SIP NOTIFY request containing the received final response code in the sipfrag body to the controller UE;
- 2) if the received response to the SIP re-INVITE is a SIP 2xx response containing an SDP answer, include within the sipfrag body
  - a) the Content-Type header field from the received SIP 2xx response; and
  - b) the SDP answer as received in the SIP 2xx response.

If any final response to a SIP re-INVITE request (apart from the SIP re-INVITE request which was sent towards the controllee UE to set the attributes (a) associated to the transferred media component to its previous status) was a 3xx or a 6xx response then the SCC AS shall consider the Inter-UE Transfer operation failed and shall send the SIP NOTIFY request to controller UE with the body populated with SIP/2.0 603 Declined.

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## 13 Roles for release of collaborative session for inter-UE transfer

### 13.1 Introduction

This clause specifies the roles of controller UE, controllee UE and the SCC AS when controller UE or the remote UE releases the collaborative session.

### 13.2 SC UE

#### 13.2.1 Procedures for collaborative session release by controller UE

##### 13.2.1.1 Controller UE

There are no specific procedures for the controller UE for the collaborative session release besides the procedures described in 3GPP TS 24.229 [7].

##### 13.2.1.2 Controllee UE

There are no specific procedures for the controllee UE for the collaborative session release besides the procedures described in 3GPP TS 24.229 [7].

#### 13.2.2 Procedures for collaborative session release by remote party

##### 13.2.2.1 Controller UE

There are no specific procedures for the controller UE for the collaborative session release besides the procedures described in 3GPP TS 24.229 [7].

### 13.2.2.2 Controllee UE

There are no specific procedures for the controllee UE for the collaborative session release besides the procedures described in 3GPP TS 24.229 [7].

## 13.3 SCC AS

### 13.3.1 Procedures for collaborative session release by controller UE

When the SCC AS receives a SIP BYE request from the controller UE for releasing a collaborative session, the SCC AS shall send a SIP BYE request according to the procedures described in 3GPP TS 24.229 [7] to the remote UE and to all controllee UEs within that collaborative session.

### 13.3.2 Procedures for collaborative session release by remote party

When the SCC AS receives a SIP BYE request from the remote party for releasing a collaborative session, the SCC AS shall send a SIP BYE request according to the procedures described in 3GPP TS 24.229 [7] to the controller UE and to all controllee UEs within that collaborative session.

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## 14 Roles for addition and deletion of media within collaborative session for inter-UE transfer

### 14.1 Introduction

This clause specifies the roles of the controller UE, the controllee UE and the SCC AS when the controller UE or the remote UE adds or releases media to the collaborative session.

### 14.2 SC UE

#### 14.2.1 Procedures for adding new media on controllee UE by controller UE

The SC UE procedures for adding new media to a controllee UE by the controller UE is the same as the procedure described in subclause 11.2.2.1 with exception that the controller UE additionally sets the port numbers for the media types of the media components (in the "body" URI header field of the SIP URI in the Refer-To header field of the SIP REFER request) which are already served by the controllee UE to values from the corresponding media lines received during the last successful SDP offer and answer exchange with the remote party.

#### 14.2.2 Procedures for releasing media on controllee UE by controller UE

The controller UE may release one or more media components on a controllee UE within a collaborative session while it has an ongoing IMS session with a remote UE.

The controller UE shall release the media by sending a SIP REFER request for releasing media component as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] and IETF RFC 7647 [54], including:

- 1) the Request-URI set to the Inter UE Transfer SCC AS URI;
- 2) the Refer-To header field as follows:
  - a) the SIP URI of the controllee UE;

NOTE: The SIP URI of the controllee UE needs to be a GRUU if the controllee UE and any other UEs share the same public user identity.

- b) the SIP URI additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session shall be set as follows:
    - media lines that are not being released with their port numbers; and
    - media line(s) that are to be released with the port number set to zero;
  - c) if the controller UE also wishes to transfer control of the collaborative session to the controller UE then the SIP URI additionally containing the XML body specified for the Refer-To URI in subclause 18.2.1;
- 3) the Accept header field set to "message/sipfrag";
  - 4) the Target-Dialog header field populated as specified in IETF RFC 4538 [40], containing the dialog identifier of the dialog between the SCC AS and the controller UE;
  - 5) the Contact header field containing:
    - the g.3gpp.iut-controller media feature tag as described in annex C; and
    - the g.3gpp.current-iut-controller media feature tag as described in annex C set to "passive" if the controller UE does not wish to remain the controller of the collaborative session; and
  - 6) the Referred-By header field containing a currently registered public user identity of the user to be delivered to the controllee UE.

The controller UE shall handle SIP response to the SIP REFER request and the subsequent SIP NOTIFY requests according to 3GPP TS 24.229 [7]. The controller UE shall save the media information (e.g. media line number) received in the sipfrag body of the SIP NOTIFY request in order to perform further inter-UE transfer operations on the controllee UE.

### 14.2.3 Procedures for releasing media on controller UE by controller UE

If the controller UE wants to release a media component on the controller UE within a collaborative session, the controller UE shall follow the procedures defined in 3GPP TS 24.229 [7] for removing media with the following differences:

1. include the SDP information for all other media components within the collaborative session in the SIP re-INVITE request;
2. set all the port numbers of the media on the controllee UEs with value zero; and
3. include the g.3gpp.iut-controller media feature tag as described in annex B in the Contact header field.

### 14.2.4 Procedures for controller UE to remove a controllee UE from the collaborative session

The controller UE may remove a controllee UE from a collaborative session while it has an ongoing IMS session with a remote UE.

The controller UE shall remove the controllee UE from the collaborative session by sending a SIP REFER request, including:

- 1) the Request-URI set to the Inter UE Transfer SCC AS URI;
- 2) the Refer-To header as follows:
  - a) the SIP URI of the controllee UE;

NOTE: The SIP URI of the controllee UE needs to be a GRUU if the controllee UE and any other UEs share the same public user identity.

- b) the method parameter set equal to "BYE";
- 3) the Accept header field set to include "message/sipfrag";

- 4) the Target-Dialog header field populated as specified in IETF RFC 4538 [40], containing the dialog identifier of the dialog between the SCC AS and the controller UE; and
- 5) the Referred-By header field containing a currently registered public user identity of the user to be delivered to the controllee UE; and
- 6) the Contact header field containing the g.3gpp.iut-controller media feature tag as described in annex B.

The controller UE shall handle response to the SIP REFER request and the subsequent SIP NOTIFY requests according to 3GPP TS 24.229 [7].

## 14.2.5 Procedures for releasing media component by controllee UE

### 14.2.5.1 Controller UE

When controller UE receives a SIP re-INVITE request, it can contain an SDP offer with:

- media lines for media components already terminated at the controller UE with non-zero port numbers;
- media line(s) for media components terminated at the controllee UE which is releasing the media component(s) with non-zero port number(s); and
- media lines for media components terminated at other controllee UEs, with port numbers set to zero.

Upon receiving such a SIP re-INVITE request, the controller UE shall follow the procedures described in 3GPP TS 24.229 [7] to accept or reject the released media component(s) by the controllee UE.

If the released media component(s) is the only media component(s) used within the collaborative session and the controller UE did not accept that media component, the controller UE shall release the collaborative session following the procedures described in 3GPP TS 24.229 [7].

### 14.2.5.2 Controllee UE

There are no specific procedures for the controllee UE for release of media component by controllee UE, besides the procedures described in 3GPP TS 24.229 [7].

## 14.2.6 Procedures for modifying media on controllee UE by itself

If the controllee UE wants to modify the characteristics of a media component on itself within a collaborative session, the controllee UE shall follow the procedures defined in 3GPP TS 24.229 [7] for modifying media.

## 14.2.7 Procedures for adding new media by remote UE when the controller UE does not alert the user

When controller UE receives a SIP re-INVITE request within an existing dialog from the remote UE to add a new media component on the collaborative session, the controller UE shall decide whether adding the new media on itself or adding it to one of its controllee UE.

If the controller UE decides to add the new media component on itself, the controller UE shall follow the procedure as specified in 3GPP TS 24.229 [7],

If the controller UE decides to add the new media component on one of its controllee UE, the controller UE shall send a SIP REFER request outside the existing dialog as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] and IETF RFC 7647 [54], and include:

- 1) the Request-URI set to the Inter UE Transfer SCC AS URI;
- 2) the Refer-To header field, including:
  - a) the SIP URI of the controllee UE where the media stream should be established from; and

NOTE: The SIP URI of the controllee UE needs to be a GRUU if the controllee UE and any other UEs share the same public user identity.

- b) the SIP URI additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session shall be set as follows:
  - media lines that are not being transferred with the port number set to zero;
  - media line(s) that are to be added at the controllee UE the same SDP information as in the SIP re-INVITE request received from the remote UE.
- 3) the Accept header field containing the MIME types "message/sipfrag";
- 4) the Target-Dialog header field containing the dialog parameters for the dialog of the existing session;
- 5) the Contact header field containing the g.3gpp.iut-controller media feature tag as described in annex B; and
- 6) the Referred-By header field containing a currently registered public user identity of the user to be delivered to the controllee UE.

The controller UE shall handle a SIP response to the SIP REFER request and the subsequent SIP NOTIFY requests according to 3GPP TS 24.229 [7]. Then the controller UE shall respond to the SIP re-INVITE request with a SIP 200 (OK) response with a SDP answer as specified in 3GPP TS 24.229 [7] including in the Contact header field the g.3gpp.iut-controller media feature tag as described in annex B, and construct the SDP information in the SIP 200 (OK) response as follows:

- 1) set the port number of the new added media component with value zero; and
- 2) set all the ports number of the media on the controllee UEs with value zero; and
- 3) for other media components on the controller UE are not changed.

If an error response is received for the SIP REFER request or the subsequent SIP NOTIFY requests include a non-2xx final response, the controller UE shall consider the transfer operation failed and make a decision again whether adding the new media on itself or adding it on other controllee UE.

## 14.2.8 Procedures for releasing media by remote UE

Upon receipt of a SIP re-INVITE request from the remote party containing an SDP offer indicating one or more media components are to be released on the controller UE, the controller UE shall release the media component following the procedures specified in 3GPP TS 24.229 [7].

If the media component to be released is the last media component between the controller UE and the remote party and if there are more media components within the collaborative session, the controller UE shall not release the dialog with the SCC AS but set the port number(s) associated to the media type(s) to zero.

If the media component to be released is the last media component in the collaborative session, the controller UE shall follow the procedures described in subclause 13.2.1.1.

## 14.3 SCC AS

### 14.3.0 Distinction of requests at the SCC AS

When SCC AS receives a SIP REFER request within a new dialog from the controller UE with:

- 1) the Request-URI set to inter UE transfer SCC AS URI;
- 2) the Target-Dialog header field identifies an existing dialog between the SCC AS and the controller UE; and
- 3) the Refer-To header field set to SIP URI of a controllee UE and containing the URI header field with the hname "body" containing SDP with a media type for each of the media (m=) lines in the session as follows:
  - all the media components with associated information in the session; and

- one or more new media components which are not used in the collaborative session yet and with associated port number set to the discard port number "9";

the SCC AS shall follow the procedure in subclause 14.3.1 to add the media component to the controllee UE.

When the SCC AS receives a SIP REFER request in a new dialog from the controller UE with:

- 1) the Request-URI set to inter UE transfer SCC AS URI; and
- 2) the Target-Dialog header field identifies an existing dialog between the SCC AS and the controller UE;
- 3) the Refer-To header field containing the SIP URI of a controllee UE and containing the URI header field with the hname a "body" containing SDP with a media type for each of the media (m=) lines in the session as follows:
  - all the media components with associated information in the session; and
  - the media component which is currently used in the collaborative session by the controllee UE is listed with port number set to 0.

then the SCC AS shall follow the procedure in subclause 14.3.2 to release the media component from the controllee UE.

If a SIP REFER request contains the Contact header field the media feature tag g.3gpp current-iut-controller set to "passive" and the SIP URI in the Refer-To header field contains the XML specified in annex D.3 containing a <controlTransfer> element containing a <targetController> element along with a <requestedBy> element then in the procedures below, such SIP REFER requests are called "SIP REFER requests for transferring control of the collaborative session".

When the SCC AS receives a SIP REFER request in a new dialog from the controller UE with:

- 1) the Request-URI set to SIP URI of the SCC AS;
- 2) the Target-Dialog header field identifies an existing dialog between the SCC AS and the controller UE; and
- 3) the Refer-To header field containing the SIP URI of a controllee UE and the method parameter set equal to "BYE";

then the SCC AS shall follow the procedure in subclause 14.3.2B to remove the controllee UE from the collaborative session.

### 14.3.1 Procedures for adding new media on controllee UE by controller UE

The SCC AS procedures for adding new media on controllee UE by the controller UE is the same as the procedure described in subclause 11.3.3 with exception that upon receipt of SIP REFER request from the controller UE, the SCC AS generates a SIP re-INVITE request within the dialog to the controllee UE instead of SIP INVITE request.

### 14.3.2 Procedures for releasing media on controllee UE by controller UE

When SCC AS receives a SIP REFER request in a new dialog from the controller UE containing a Refer-To header indicating that a SIP INVITE request is to be sent to remove one or more media components on a controllee UE, the SCC AS shall send:

- 1) a SIP 200 (OK) response to the controller UE;
- 2) SIP NOTIFY request with a sipfrag including SIP 100 (Trying) to the controller UE;
- 3) send a SIP UPDATE request or a SIP re-INVITE request towards the remote leg as specified in 3GPP TS 24.229 [7] with the following clarifications:
  - if the controllee UE is sending media, include a "a=sendonly" attribute for the media component to be released;
  - if the controllee UE is only receiving media, include a "a=inactive" attribute for the media component to be released;

- include b=RR:0 and b=RS:0 bandwidth modifiers as specified in IETF RFC 3556 [33] for the media component to be released; and

When the SIP 200 (OK) response to the SIP UPDATE request or the SIP re-INVITE request is received from the remote leg the SCC AS continues with the next steps;

NOTE 1: The steps in 3) are needed to avoid unnecessary ICMP message sending in the underlying IP network due to media sent to closed port that could result in the release of the call. The ICMP message is specified in IETF RFC 792 [28].

- 1) send a SIP re- INVITE request to the controllee UE, containing an SDP offer changed using the media type(s) present in the hname "body" URI header field from the SIP URI in the Refer-To header; and
- 2) the Referred-By header field containing the values from the Referred-By header field of the received SIP REFER request according to the procedures of IETF RFC 3892 [36].

NOTE 2: This SIP re-INVITE request is triggered by the SIP REFER request. The previous SIP INVITE request was generated by the SCC AS due to third party call control to allow sending this SIP re-INVITE request.

Upon receiving a SIP 200 (OK) response from the controllee UE, the SCC AS shall send a SIP re-INVITE request to the remote leg as specified in 3GPP TS 24.229 [7]. The SCC AS shall construct the SDP information in the SIP re-INVITE request as follows:

- 1) set port number for each removed media component to zero; and
- 2) include the SDP information for all other media components in the collaborative session as from the original session to the remote leg.

Upon receiving SIP 200 (OK) response with the SDP answer from the remote leg, the SCC AS shall send:

- 1) a SIP ACK request to the remote leg;
- 2) upon successful release of the media component, a SIP NOTIFY request to the controller UE containing a sipfrag body that shall include the SIP 200 (OK) response of the SIP re-INVITE request and also include the Content-Type header field from the received 200 (OK) response along with the SDP answer received from the controllee UE.

### 14.3.2A Procedures for releasing media on controller UE by controller UE

When SCC AS receives a SIP re-INVITE request within an existing dialog from the controller UE to remove a media component on itself, the SCC AS shall send a SIP re-INVITE request to the remote UE as specified in 3GPP TS 24.229 [7]. The SCC AS shall construct the SDP information in the SIP re-INVITE request as follows:

- 1) set port number(s) for each of the removed media component(s) to zero; and
- 2) include the SDP information for all other media components in the collaborative session as received during the last successful SDP offer-answer exchange from the remote UE.

Upon receiving SIP 200 (OK) response with the SDP answer from the remote UE, the SCC AS shall send:

- 1) a SIP ACK request to the remote UE;
- 2) a SIP 200 (OK) response to the controller UE as specified in 3GPP TS 24.229 [7]. The SCC AS shall construct the SDP information in the SIP 200 (OK) response as follows:
  - set port number(s) for each of the removed media component(s) to zero; and
  - set all the ports number of the media on the controllee UEs with value zero.

### 14.3.2B Procedures for controller UE removing controllee UE from the collaborative session

When SCC AS receives a SIP REFER request in a new dialog from the controller UE containing a Refer-To header indicating that a SIP BYE request is to be sent to a controllee UE, the SCC AS shall send:

- 1) SIP 200 (OK) response to the controller UE;
- 2) SIP NOTIFY request with sipfrag including SIP 100 Trying to the controller UE; and
- 3) SIP UPDATE request or a SIP re-INVITE request towards the remote leg as specified in 3GPP TS 24.229 [7] with the following clarifications:
  - if the controllee UE is sending media, include a "a=sendonly" attribute for the media component to be released;
  - if the controllee UE is only receiving media, include a "a=inactive" attribute for the media component to be released; and
  - include b=RR:0 and b=RS:0 bandwidth modifiers as specified in IETF RFC 3556 [33] for the media component to be released.

NOTE: The steps in 3) are needed to avoid unnecessary ICMP message sending in the underlying IP network due to media sent to closed port that could result in the release of the call. The ICMP message is specified in IETF RFC 792 [28].

When the SIP 200 (OK) response to the SIP UPDATE request or the SIP re-INVITE request is received from the remote leg the SCC AS shall send a SIP BYE request to the controllee UE to release the controlled session in accordance with 3GPP TS 24.229 [7] including the Referred-By header field containing the values from the Referred-By header field of the received SIP REFER request according to the procedures of IETF RFC 3892 [36].

Upon receiving SIP 200 (OK) response from the controllee UE, the SCC AS shall send a SIP re-INVITE request to the remote leg as specified in 3GPP TS 24.229 [7]. The SCC AS shall construct the SDP information in the SIP re-INVITE request as follows:

- 1) set port number(s) for each removed media component(s) to zero; and
- 2) include the SDP information for all other media components in the collaborative session as from the original session to the remote leg.

Upon receiving SIP 200 (OK) response with the SDP answer from the remote leg, the SCC AS shall send:

- 1) a SIP ACK request to the remote leg;
- 2) upon successful release of the media component, a SIP NOTIFY request to the controller UE containing a sipfrag body that shall include the SIP 200 (OK) response of the SIP BYE request.

### 14.3.3 Procedures for releasing media component initiated by controllee UE

When the SCC AS receives a SIP re-INVITE request from a controllee UE containing an SDP offer with one or more media line(s) used on the controllee UE with port number set to zero, where the port number was previously not zero, the SCC AS shall send a SIP re-INVITE request towards the controller UE containing an SDP offer with the following details:

- 1) for the media lines on the controller UE, set the port numbers to the values received during the last successful SDP offer and answer exchange with the remote party;
- 2) for the media lines on the controllee UE which were offered with port numbers set to zero in the SDP offer received in the re-INVITE from the controllee UE, set the port numbers to the values received during the last successful SDP offer and answer exchange with the remote party; and
- 3) set the port number to zero for the remaining media lines.

When the SCC AS receives a SIP BYE request from a controllee UE, the SCC AS shall send a SIP re-INVITE request towards the controller UE containing an SDP offer with the following details:

- 1) for the media lines on the controller UE, set the port numbers to the values received during the last successful SDP offer and answer exchange with the remote party;



- 2) for the media lines on the controllee UE, set the port numbers to the values received during the last successful SDP offer and answer exchange with the remote party; and
- 3) set the port number to zero for the remaining media lines.

Upon receiving the SIP 200 (OK) response to the SIP re-INVITE request from the controller UE and in addition to the procedures of 3GPP TS 24.229 [7], the SCC AS shall send a SIP re-INVITE request towards the remote party containing an SDP offer with:

- 1) all the media lines which were not released by the controllee UE including their port numbers; and
- 2) all the media lines which were released by the controllee UE set to the port numbers received in the SDP answer contained in the SIP 200 (OK) response from the controller UE.

Upon receiving the SIP 200 (OK) response from the remote party, and in addition to the procedures of 3GPP TS 24.229 [7], the SCC AS shall:

- 1) if the transaction was initiated by a SIP re-INVITE request, send a SIP 200 (OK) response for the SIP re-INVITE request towards the controllee UE containing an SDP answer accepting the SDP offer from the controllee UE; or
- 2) if the transaction was initiated by a SIP BYE request, send a SIP 200 (OK) response for the SIP BYE request towards the controllee UE.

#### 14.3.4 Procedures for modifying media on controllee UE by itself

When SCC AS receives a SIP re-INVITE request within an existing dialog from the controllee UE to modify a media component on itself, the SCC AS shall send a SIP re-INVITE request to the remote UE as specified in 3GPP TS 24.229 [7]. The SCC AS shall construct the SDP information in the SIP re-INVITE request as follows:

- 1) set the modified media information as the same in the SIP re-INVITE request received from the controllee UE; and
- 2) include the SDP information for all other media components in the collaborative session as received during the last successful SDP offer-answer exchange from the remote UE.

Upon receiving SIP 200 (OK) response with the SDP answer from the remote UE, the SCC AS shall send:

- 1) a SIP ACK request to the remote UE; and
- 2) a SIP 200 (OK) response to the controllee UE with an SDP answer that only contains the media component on the controllee UE.

#### 14.3.5 Procedures for adding new media by remote UE when the controller UE does not alert the user

When SCC AS receives a SIP REFER request from the controller UE to add a new media component on a controllee UE, the SCC AS shall send:

- 1) SIP 200 (OK) response
- 2) SIP NOTIFY request containing a sipfig for a SIP 100 (Trying) response to the controller UE as described in IETF RFC 3515 [32] as updated by RFC 6665 [48];
- 3) if the target controllee UE has not been involved in the collaborative session, send an initial SIP INVITE request to the controllee UE to add the controllee UE in the collaborative session, containing:
  - a) Request-URI with SIP URI from the Refer-To header field of the received SIP REFER request;
  - b) the Referred-By header field containing the values from the Referred-By header field of the received SIP REFER request according to the procedures of IETF RFC 3892 [36];
  - c) the P-Asserted-Identity header field containing the identity of the remote UE as received in the P-Asserted-Identity header field from SIP re-INVITE request received from the remote UE; and

- d) the SDP information for the media component to be transferred as follows:
- The media type(s) from the media (m=) lines from the hname "body" URI header field from the SIP URI in the Refer-To header field of the received SIP REFER request; and
  - for media lines which have non zero port numbers the SDP parameters from the corresponding media lines as received in the SDP offer from the remote UE in the SIP re-INVITE request.
- 4) if there are other media component within the collaborative session between the target controllee UE and the remote UE, send a SIP re-INVITE request to the controllee UE, containing:
- a) the Referred-By header field containing the values from the Referred-By header field of the received SIP REFER request according to the procedures of IETF RFC 3892 [36];
  - b) the SDP information for the media component to be transferred as follows:
    - The media type(s) from the media (m=) lines from the hname "body" URI header field from the SIP URI in the Refer-To header field of the received SIP REFER request; and
    - for media lines which have non zero port numbers, the SDP parameters from the corresponding media lines as received in the SDP offer from the remote UE in the SIP re-INVITE request
    - for other media components that have already involved in the collaborative session are not changed.

Upon receiving a SIP final response from the controllee UE, the SCC AS shall send, a SIP NOTIFY request containing the received response code in the sipfrag body and if the received SIP response was a SIP 200 (OK) response containing an SDP answer then also include in the sipfrag the Content-Type header field from the received SIP 200 (OK) response along with the media (m=) lines from the SDP answer.

If the SIP final response was a non 2xx response then the SCC AS shall consider the transfer operation failed and abort the media transfer.

If the SIP final response was a SIP 200 (OK) response containing a SDP answer, the SCC AS shall:

- 1) send a SIP ACK request to the controllee UE;
- 2) send a SIP 200 (OK) response to the remote UE as specified in 3GPP TS 24.229 [7]. The SCC AS shall construct the SDP information in the SIP 200 (OK) response as follows:
  - set the same SDP information for the new added media as in the SIP 200 (OK) response received from the controllee UE; and
  - include the SDP information for all other media in the collaborative session as received during the last successful SDP offer-answer exchange from the remote UE.

### 14.3.6 Procedures for releasing media by remote UE

Upon receipt of a SIP re-INVITE request from the remote party containing an SDP offer indicating one or more media components to be released on the controller UE, the SCC AS shall set the port number on the media line(s) which are not on controller UE to zero and forward the SIP re-INVITE request towards the controller UE following the procedures as specified in 3GPP TS 24.229 [7].

Upon receipt from the remote party of a SIP re-INVITE request containing an SDP offer indicating one or more media components to be released on the controllee UE, the SCC AS shall:

- if there are more media components left after releasing the selected media components, set the port number(s) on the media line(s) which are not on the controllee UE to zero and forward the SIP re-INVITE request; or
- if there are no more media components left after releasing the selected media components, send a SIP BYE request;

towards the controllee UE following the procedures as specified in 3GPP TS 24.229 [7].

Upon receipt of a SIP re-INVITE request from the remote party containing an SDP offer indicating one or more media components to be released on the controller UE and one or more media components to be released on the controllee UE(s), the SCC AS shall:

- send a SIP re-INVITE request to the controller UE containing the SDP received from the remote end with the exception that the port numbers of the media components, not terminated on the controller UE, are set to zero;
- if not all the media component(s) are being released on the controllee UE, send a SIP re-INVITE request to that controllee UE, containing the SDP received from the remote end with the exception that the port numbers of the media components, not terminated on the controllee UE, are set to zero; and
- if all the media component(s) are being released on the controllee UE, send a SIP BYE request to the controllee UE.

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## 15 Roles for session discovery

### 15.1 Introduction

This clause specifies the session discovery procedures of the SC UE and the SCC AS.

### 15.2 SC UE

#### 15.2.1 Discovery of sessions

In order to discover sessions of a user, the SC UE shall send SIP SUBSCRIBE request according to IETF RFC 4235 [3]. The SC UE shall populate the SIP SUBSCRIBE request as follows:

1. the Request-URI set to the public user identity of the user;
2. the Event header field:
  - a. containing the "dialog" event package name; and
  - b. the "include-session-description" header field parameter if the SC UE wants to obtain session descriptions;
3. the Accept-Contact header field with the g.3gpp.iut-focus media feature tag together with explicit and require; and
4. the Expires header field set to zero.

#### 15.2.2 Discovery of collaborative session changes

In order to get the information about the collaborative session changes, the controller UE shall send SIP SUBSCRIBE request according to IETF RFC 4235 [38]. The controller UE shall populate the SIP SUBSCRIBE request as follows:

- 1) the Request-URI set to the Inter UE Transfer SCC AS URI;
- 2) the Event header field containing the "dialog" event package name and the parameter "include-session-description";
- 3) the Target-Dialog header field containing the dialog information of the collaborative session; and
- 4) the Expires header field set to:
  - a) zero to receive one SIP NOTIFY request; or
  - b) different than zero to receive the subsequent SIP NOTIFY requests.

## 15.3 SCC AS

### 15.3.1 Distinction of requests sent to the SCC AS

The SCC AS distinguish between the following initial SIP requests:

- 1) SIP SUBSCRIBE request containing:
  - a) Request-URI containing the Inter UE Transfer SCC AS SIP URI; and
  - b) Target-Dialog header field containing dialog information of a collaborative session belonging to the user identified by URI in the P-Asserted-Identity header field.

In the procedures below, such request is known as "SIP SUBSCRIBE request for discovery of collaborative session changes".

- 2) SIP SUBSCRIBE request containing:
  - a) Request-URI with the public user identity of a served user;
  - b) the Event header field with "dialog" event package name; and
  - c) the Accept-Contact header field with the g.3gpp.iut-focus media feature tag along with explicit and require.

In the procedures below, such request is known as "SIP SUBSCRIBE request for session discovery".

Other SIP SUBSCRIBE requests can be dealt with in any manner conformant with 3GPP TS 24.229 [7].

### 15.3.2 SCC AS procedures for discovery of sessions

When the SCC AS receives a SIP SUBSCRIBE request for session discovery, the SCC AS shall:

1. if the subscriber is not authorized to receive the dialog information of the user identified by Request-URI, then reject the SIP request with a SIP 403 (Forbidden) response and do not process the remaining steps; and
2. handle the SIP request according to IETF RFC 4235 [38] and 3GPP TS 24.229 [7].

### 15.3.3 SCC AS procedures for discovery of collaborative session changes

When the SCC AS receives a SIP SUBSCRIBE request for discovery of collaborative session changes, the SCC AS shall handle the SIP request according to IETF RFC 4235 [38].

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## 16 Roles for collaborative sessions involving participants with different subscriptions

### 16.1 Introduction

This clause specifies the collaborative session procedures in the case when users of different subscriptions participate in the collaborative session as controller or controllee.

### 16.2 SC UE

The procedures in subclause 11.2.1.1 apply.

## 16.3 SCC AS serving the collaborative session

Before sending the inter-UE transfer request towards the controllee UE, the SCC AS serving the collaborative session, shall act as follows:

- 1) if the Contact header field contains the address of the SCC AS, insert the media feature tag `g.3gpp.iut-focus` as described in annex B.3 into the Contact header field; or
- 2) if the Contact header field does not contain the address of the SCC AS, insert the feature-capability indicator `g.3gpp.iut-focus` into the Feature-Caps header field as described in IETF RFC 6809 [44].

If the SCC AS serving the collaborative session inserted the feature-capability indicator `g.3gpp.iut-focus` into the Feature-Caps header field in the inter-UE transfer request towards the controllee UE then the SCC AS serving the collaborative session shall include the feature-capability indicator `g.3gpp.iut-focus` into the Feature-Caps header field in any target refresh request and, in each 1xx or 2xx response to target refresh request sent to the controllee UE.

When the SCC AS in the home network of the controllee UE receives the inter-UE transfer request containing the media feature tag `g.3gpp.iut-focus` in the Contact header field or containing the feature-capability indicator `g.3gpp.iut-focus` in the Feature-Cap header field, it will forward the inter-UE transfer request to the controllee UE without applying inter-UE transfer functionality.

NOTE: The SCC AS in the home network of the controller UE takes full control of the collaborative session. Further SCC AS added in the home networks of controllee UEs do not influence the collaborative session call flows in a way which would cause additional signalling from/to the SCC AS in the home network of the controller UE. The SCC AS in the home network of the controller UE therefore does not need to distinguish whether a request is sent to / received from a controllee UE directly or via an SCC AS in the controllee UEs home network.

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## 17 Roles for establishment of a collaborative session during session setup

### 17.1 Introduction

This clause specifies the procedures for establishment of a collaborative session during both originating and terminating session setup. Procedures are specified for the controller capable UE and the SCC AS.

### 17.2 Originating session setup

#### 17.2.1 Controller UE

To establish a collaborative session upon originating session setup the controller UE sends a SIP INVITE request to the remote party in accordance with the procedures specified in 3GPP TS 24.229 [7]. The controller UE shall populate the SIP INVITE request as follows:

- 1) the Request-URI set to the URI of the remote party; and
- 2) the SDP information as follows:
  - a) for the media component(s) served by itself, the port numbers of the UE; and
  - b) for the media component(s) to be established in the controllee UE, as follows:
    - the port numbers set to non zero;
    - the connection address set to 0.0.0.0 in case of IPv4 or set to domain name within the ".invalid" DNS top-level domain in case of IPv6 as described in IETF RFC 6157 [43]; and
    - "a=3gpp.iut.controllee" attribute set to the SIP URI of controllee UE.

Upon receiving a SIP 200 (OK) response with the SDP answer from SCC AS, the controller UE shall send a SIP ACK request to the SCC AS.

## 17.2.2 SCC AS serving the collaborative session

Upon receiving a SIP INVITE request including SDP containing media with the "a=3gpp.iut.controllee" attribute, the SCC AS shall send a SIP INVITE request to the controllee UE including:

- 1) the Request-URI set to the URI of the controllee UE which is indicated in the "a= 3gpp. iut.controllee" attribute;
- 2) the P-Asserted-Identity header field set to the URI of the controller UE; and
- 3) the SDP information as follows:
  - a) for the media component(s) that are to be established on the controller UE containing the port number set to zero; and
  - b) for the media component(s) that are to be established on the controllee UE:
    - set the connection address to 0.0.0.0 in case of IPv4 or set to domain name within the ".invalid" DNS top-level domain in case of IPv6 as described in IETF RFC 6157 [43];
    - set the port number to non zero; and
    - remove the attribute "a=3gpp.iut.controllee".

Upon receiving a SIP 18x provisional response or a SIP 2xx successful response from the controllee UE that includes an SDP answer, the SCC AS shall send a SIP INVITE request to the remote party including:

- 1) the Request-URI set to the URI of the remote party using the URI from the Request-URI of the original SIP INVITE request;
- 2) the P-Asserted-Identity header field set to the URI of the controller UE; and
- 3) the SDP information as follows:
  - a) for the media component(s) that are to be established on the controller UE containing the port number set to the port numbers of the controller UE; and
  - b) for the media component(s) that are to be established on the controllee UE containing the port number for the corresponding media received in the media line of the SDP received during the last successful SDP offer/answer exchange.

Upon receiving a SIP 18x provisional response or a SIP 2xx successful response from the remote UE, the SCC AS shall forward the SIP 18x provisional response or a SIP 2xx successful response to the controller UE and send a SIP re-INVITE/UPDATE request to the controllee UE to update the media description based upon the last successful SDP offer/answer exchange with the remote party.

Upon receiving a SIP 200 (OK) response from the controllee UE, the SCC AS shall send a SIP ACK request to the controllee UE.

**Editor's Note: When the SCC AS acts as the third party call controller, the relationship between the header fields received in a SIP message and those in the SIP message generated as a result needs to be described. In particular this needs to cover actions on the Privacy header field.**

Upon receiving the second (and the subsequent) SIP 18X response from the second (and the subsequent) remote UE that includes a SDP answer, the SCC AS determines that the call is forked as specified in IETF RFC 3261 [30] and shall perform as follows:

- 1) if the SCC AS has not yet received any SIP 200 (OK) response from any remote UE for the collaborative session, the SCC AS shall save the SIP 18X response without sending a SIP re-INVITE/UPDATE message to the controllee UE and update the remote UE on the availability of resources at the controller UE and the controllee UE; and

- 2) if afterwards, the SCC AS receives a SIP 200 (OK) response from the second (or one of the subsequent) remote UE before or without receiving any SIP 200 (OK) response from any other remote UE, the SCC AS shall forward the SIP 200 (OK) response to the controller UE and send a SIP re-INVITE/UPDATE request to the controllee UE for media re-negotiation with the remote UE based on the saved SIP 18X response from the remote UE that sends the SIP 200 (OK) response. Thus a collaborative session is established between the remote UE that first sends the SIP 200 (OK) response and the controller/controllee UE.

## 17.3 Terminating session setup

### 17.3.1 Controller capable UE

Upon receiving a SIP initial INVITE request from the remote party, the controller capable UE shall send a SIP 300 (Multiple Choices) response to the SIP initial INVITE request in accordance with the procedures specified in 3GPP TS 24.229 [7] as follows:

- 1) a Contact header field for each UE that is to be a participant in the collaborative session (including the controller capable UE if the controller capable UE is also a participant) containing the SIP URI of that UE

NOTE: The SIP URI of the UE needs to be a GRUU if any of the UEs that are participants of the collaborative session share the same public user identity.

- 2) a Content-Type header field containing the MIME type application/vnd.3gpp.iut+xml; and
- 3) an application/vnd.3gpp.iut+xml MIME body containing a <controlTransfer> element that contains:
  - i) an <activeController> element containing the SIP URI of the controller UE for the collaborative session and additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session set as follows:
    - media lines that are not being assigned to the controller capable UE with the port number set to zero
    - media line(s) that are to be assigned to the controller capable UE containing the port number for the corresponding media types received in the media line of the SDP offer in the SIP INVITE request; and
  - ii) a <Controllee> element for each controllee UE that is to be a participant in the collaborative session containing the SIP URI of the controllee UE for the collaborative session and additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session set as follows:
    - media lines that are not being assigned to that controllee UE with the port number set to zero
    - media line(s) that are to be assigned to that controllee UE containing the port number for the corresponding media types received in the media line of the SDP offer in the SIP INVITE request;

If the controller capable UE indicated in the SIP 300 (Multiple Choices) response that it will be a participant in the collaborative session then the controller capable UE will receive a SIP INVITE request containing an SDP offer. The controller capable UE shall handle the SIP INVITE request in accordance with the procedures specified in 3GPP TS 24.229 [7].

If the controller capable UE indicated in the SIP 300 (Multiple Choices) response that it will be the controller UE for the collaborative session then the controller capable UE shall when accepting the session behave as a controller UE of the collaborative session, otherwise the controller capable UE shall act as a controllee UE for the collaborative session.

### 17.3.2 SCC AS serving the collaborative session

When forwarding an initial SIP INVITE request from the remote party to the controller capable UE the SCC AS shall add an Accept header field containing the MIME type application/vnd.3gpp.iut+xml to the SIP INVITE request.

Upon receiving a SIP 300 (Multiple Choices) response containing the MIME body application/vnd.3gpp.iut+xml from the controller capable UE in response to the initial SIP INVITE request, the SCC AS shall:

- 1) send a SIP ACK request to the controller capable UE in accordance with the procedures specified in 3GPP TS 24.229 [7];

- 2) authorise the request for the collaborative session setup with the controllee UE(s) identified in the <controllee> element in the MIME body of the SIP 300 (Multiple Choices) response; and
- 3) consider the UE identified in <activeController> element in the MIME body of the SIP 300 (Multiple Choices) as the controller UE for the collaborative session.

If authorised the SCC AS shall send a SIP 183 (Session Progress) response to the remote UE containing an SDP answer as follows:

- 1) for all media lines indicated in the MIME body of the SIP 300 (Multiple Choices) response, set the port numbers to the discard port number "9" and set to "a=inactive"; and
- 2) for any media lines in the original SDP offer that are not indicated in the MIME body of the SIP 300 (Multiple Choices) response, set the port numbers to zero.

To establish the media the SCC AS shall send a SIP INVITE request to each UE identified in the Contact header fields of the SIP 300 (Multiple Choices) response including:

- 1) the Request-URI set to the URI of the UE from a Contact header field of the SIP 300 (Multiple Choices) response;
- 2) the P-Asserted-Identity header field containing the identity of the remote UE as received in the P-Asserted-Identity header field from the remote UE in the original SIP INVITE request; and
- 3) the SDP information for the media component to be transferred to that UE as follows:
  - a) the media type(s) from the media (m=) lines from the hname "body" URI header field in the corresponding SIP URI in the <activeController> element and <controllee> element(s) in the <controlTransfer> element of the application/vnd.3gpp.iut+xml MIME body of the SIP 300 (Multiple Choices) response; and
  - b) for media lines which have non zero port numbers the SDP parameters from the corresponding media lines as received in the SDP offer from the remote UE and extended with
    - i) sendonly directionality; and
    - ii) bandwidth information with RS set to zero and RR set to zero.

If the SIP final response was a non 2xx response then the SCC AS shall consider the transfer operation failed and the SCC AS shall send to the controller capable UE either a SIP re-INVITE request if a 2xx response has been received from the controller UE or a SIP UPDATE request if a final response has not yet been received from the controller capable UE following the procedures described in 3GPP TS 24.229 [7] as follows:

- 1) containing SDP reoffering the media component(s) that were offered to the UE that did not accept the SDP offer.

If a response containing an SDP answer is received from a local UE, the SCC AS shall send a SIP UPDATE request on the dialog for the remote leg to the remote UE as specified in 3GPP TS 24.229 [7]. The SCC AS shall:

- 1) send a SIP UPDATE request containing SDP information as follows:
  - a) for the transferred media component(s), set the SDP information as from the SDP answer received in the response from the UE; and
  - b) for all other media components in the collaborative session, include the SDP information as from the previous offer answer exchange with the remote leg.

Upon receipt of a 2xx response for the SIP UPDATE request sent to the remote UE, the SCC AS shall send a SIP UPDATE request to the local UE that terminates the media component accepted in the SDP answer from the remote UE following the procedures described in 3GPP TS 24.229 [7] and set the directionality (i.e. sendrecv/sendonly/recvonly/inactive) attributes associated to the transferred media component to according to the SDP answer received from the remote UE.

Upon receipt of a 2xx response for the SIP INVITE request sent to the controller capable UE, the SCC AS shall send a SIP 2xx response to the remote UE following the procedures described in 3GPP TS 24.229 [7] to establish the session with the remote UE.



Upon receiving a SIP ACK request from the remote UE, the SCC AS shall send a SIP ACK request to each local UE once a SIP 200 (OK) response has been received from the local UE.

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## 18 Roles for assignment and transfer of control of a collaborative session

### 18.1 Introduction

This clause specifies the roles of controller UE, controller capable UE and the SCC AS when a controller UE transfers control of the collaborative session to another UE. The procedures in this clause may be combined with the procedures for adding, transferring or removing media on the controllee UE as specified in subclauses 11.2, 12.2 and 14.2 in order to transfer control while adding, transferring or removing media.

### 18.2 SC UE

#### 18.2.1 Controller UE

To transfer control of the collaborative session the controller UE shall send a SIP REFER request outside the existing dialog as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] and include:

- 1) the Request-URI set to the Inter UE Transfer SCC AS URI;
- 2) the Refer-To header field set as follows:
  - a) the SIP URI of the UE that is requested to become a controller of the collaborative session; and

NOTE: The SIP URI of the UE that is requested to become a controller of the collaborative session needs to be a GRUU if the UE that is requested to become a controller of the collaborative session and any other UEs share the same public user identity.

- b) the SIP URI additionally containing the URI header field with the hname "body" containing the XML specified in annex C.2 containing a <controlTransfer> element containing a <targetController> element containing the SIP URI of the UE that is requested to become a controller of the collaborative session;
- 3) the Accept header field containing the MIME type "message/sipfrag";
- 4) the Target-Dialog header field containing the dialog parameters for the dialog of the existing session;
- 5) the Contact header field containing:
  - the g.3gpp.iut-controller media feature tag as described in annex B.2; and
  - the g.3gpp.current-iut-controller media feature tag as described in annex B.4 set to "passive".
- 6) the Referred-By header field containing a currently registered public user identity of the user to be delivered to the UE that is requested to become a controller of the collaborative session.

The controller UE shall handle any response to the SIP REFER request and the subsequent SIP NOTIFY requests according to 3GPP TS 24.229 [7] and IETF RFC 3515 [32] as updated by RFC 6665 [48]. The controller UE shall examine the Contact header field included in the sipfrag of the SIP 200 OK response in the SIP NOTIFY of the refer events package and if that Contact header field contains the g.3gpp.current-iut-controller media feature tag set to "active" then control has been successfully transferred and the controller UE shall perform the role of a controllee UE in the collaborative session, otherwise the controller UE shall consider the control transfer operation failed and continue as the controller of the collaborative session.

If an error response is received for the SIP REFER request or the subsequent SIP NOTIFY requests include a non-2xx final response, the controller UE shall consider the control transfer operation failed and continue as the controller of the collaborative session.

## 18.2.2 Controller capable UE

When the controller capable UE receives a SIP INVITE request or a SIP re-INVITE request containing a multipart/mixed MIME body containing a SDP offer and an XML body containing a <controlTransfer> element as specified in annex C.2 the controller capable UE shall when accepting the SDP offer send a SIP 200 (OK) response according to the procedures described in 3GPP TS 24.229 [7].

NOTE 1: The controller capable UE uses the media lines in the SDP offer to identify all the media types involved in the collaborative session and their order in the SDP for the collaborative session.

If the <controlTransfer> element contains a <targetController> element containing the SIP URI of this controller capable UE the controller capable UE shall determine whether to accept control of the collaborative session.

NOTE 2: Determining whether to accept control of the collaborative session could require interaction with the user.

If the controller capable UE accepts control of the collaborative session the controller capable UE shall include the media feature tag g.3gpp.current-iut-controller set to "active" in the Contact header of the SIP 200 OK response and assume the role of controller of the collaborative session.

If the controller capable UE does not accept the SDP offer or rejects the SIP INVITE request with a 3xx, 4xx, 5xx or 6xx response, the controller capable UE shall not assume the role of controller of the collaborative session.

## 18.3 SCC AS

### 18.3.1 Procedures for transferring control of the collaborative session

When the SCC AS transfers control of a collaborative session as a result of receiving a SIP REFER request for transferring control of the collaborative session, the SCC AS shall send:

- 1) a SIP 200 (OK) response to the SIP REFER request and a SIP NOTIFY request containing a sipfrag "SIP 100 Trying" to the controller UE as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48]; and
- 2) a SIP INVITE request or SIP re-INVITE request to the UE identified by the SIP URI in the Refer-To header field, containing:
  - a) Request-URI with SIP URI from the Refer-To header field of the received SIP REFER request;
  - b) the Referred-By header field containing the values from the Referred-By header field of the received SIP REFER request according to the procedures of IETF RFC 3892 [36];
  - c) the P-Asserted-Identity header field containing the identity of the remote UE as received in the P-Asserted-Identity header field from the remote UE at the original session establishment;
  - d) the Content-Type header field set to the MIME type "multipart/mixed"; and
  - e) a "multipart/mixed" MIME body containing the following MIME parts:
    - i) the Content-Type header field set to "application/sdp" and SDP information as follows:
      - I) if there are media (m=) lines in the hname "body" URI header field in the SIP URI in the Refer-To header field of the received SIP REFER request then:
        - include the media type(s) from the media (m=) lines from the hname "body" URI header field in the SIP URI in the Refer-To header field of the received SIP REFER request; and
        - if any media (m=) lines from the hname "body" URI header field in the SIP URI in the Refer-To header field of the received SIP REFER request are set to non zero port numbers and the corresponding media component is not already on the UE to which control is being transferred then additionally follow the procedures in subclause 11.3.2, or subclause 12.3.1, or subclause 19.3.2 for transferring media or subclause 11.3.3 for adding media based on the determination procedure in 11.3.1;

- II) if there are not any media (m=) lines in the hname "body" URI header field in the SIP URI in the Refer-To header field of the received SIP REFER request then include the media lines and attributes as agreed in the last SDP offer answer exchange with the UE identified by the SIP URI in the Refer-To header field;
- ii) the Content-Type header field set to "application/vnd.3gpp.iut+xml" along with the handling parameter set to optional and the XML document from the hname "body" URI header field in the SIP URI in the Refer-To header field of the received SIP REFER request.

If the SIP final response to the SIP INVITE request or SIP re-INVITE request was a non 2xx response then the SCC AS shall consider the transfer of control operation failed and abort the transfer of control of the collaborative session and continue the existing session with media components and controller UE prior to the failed transfer attempt.

Upon receiving a final response to the SIP INVITE request or SIP re-INVITE request which was sent towards the controller capable UE, the SCC AS shall:

- 1) send a SIP ACK request to the controller UE that sent the final response;
- 2) send a SIP NOTIFY request containing the received final response code in the sipfrag body to the controller UE that sent the SIP REFER request;
- 3) if the received response is a SIP 2xx response containing an SDP answer, then include within the sipfrag body
  - a) the Contact header field from the received SIP 2xx response including the media feature tags;
  - b) the Content-Type header field from the received SIP 2xx response; and
  - c) the SDP answer received in the SIP 2xx response; and
- 4) if the Contact header field from the received SIP 2xx response contains the media feature tag g.3gpp.current-iut-controller set to "active" then consider the UE that sent the SIP 2xx response as the controller of the collaborative session.

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## 19 Roles for media flow transfer

### 19.1 Introduction

The following subclauses describe the procedures and call flows of media flows transfer initiated by the target UE and by a UE other than the target UE.

### 19.2 SC UE

#### 19.2.1 Media flows transfer initiated by a UE not participating in the ongoing collaborative session

For requesting media transfer to the requesting UE (the target UE), the target UE sends a SIP REFER to the controller UE in the ongoing collaborative session with transferred media. The SIP REFER request includes:

NOTE 1: Before requesting media flow transfer, the target UE of media transfer discovers the ongoing collaborative session with transferred media and gets information about its media flows by subscribing to dialog event.

- 1) the Request-URI set to the SIP URI of the controller UE in the ongoing collaborative session with transferred media;

NOTE 2: The SIP URI of the controller UE needs to be a GRUU if multiple UEs share the same public user identity.

- 2) the Refer-To header field set as follows:
  - a) The SIP URI of the Target UE;

NOTE 3: The SIP URI of Target UE needs to be a GRUU if the Target UE and any other UEs share the same public user identity.

- b) the SIP URI additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session set as follows:
  - Media lines which are not being transferred with the port numbers set to zero
  - Media lines which are to be transferred containing the port number of the Remote UE;
- 3) the Accept-Contact header field containing the g.3gpp.iut-focus media feature tag as described in annex B.3 with explicit and require tags;
- 4) the Accept header field containing the MIME type "message/sipfrag";
- 5) the Target-Dialog header field containing the dialog parameters for the dialog of the ongoing collaborative session with the transferred media; and

NOTE 4: The dialog parameters are obtained by subscribing to dialog event package.

- 6) the Referred-By header field containing a currently registered public user identity of the user.

## 19.2.2 Media flow transfer initiated by a UE not participating in the ongoing collaborative session - media on controllee UE

The procedures of the SC UE are identical as described in subclause 19.2.1.

## 19.2.3 Media flows transfer initiated when no collaborative session has been established

To transfer a media component when no collaborative session has been established, the Target UE shall send a SIP REFER request to the SCC AS as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] and include:

NOTE 1: Before requesting media flow transfer, the target UE of media transfer discovers the ongoing session with transferred media and gets information about its media flow by subscribing to dialog event.

- 1) the Request-URI set to the SIP URI of the local UE that currently holds the media for the session;

NOTE 2: The SIP URI of the local UE need to be a GRUU if multiple UEs share the same public user identity.

- 2) the Refer-To header field set as follows:

- a) the SIP URI of the Target UE to which the media m-lines are to be transferred; and

NOTE 3: The SIP URI of Target UE needs to be a GRUU if the Target UE and any other UEs share the same public user identity.

- b) the SIP URI additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session set as follows:
  - media lines which are not being transferred with the port numbers set to zero; and
  - media lines which are to be transferred containing the port numbers of the remote UE.
- 3) an Accept-Contact header field containing the g.3gpp.iut-focus media feature tag as described in annex B.3 with explicit and require tags;
- 4) an Accept header field containing the MIME type "message/sipfrag";
- 5) the Target-Dialog header field containing the dialog parameters for the dialog of the existing session; and

NOTE 4: The dialog parameters are obtained by subscribing to the dialog event package.

- 6) the Referred-By header field containing a currently registered public user identity of the user.

## 19.2.4 Media flows transfer initiated by a controllee UE of an ongoing collaborative session

The controllee UE initiates the transfer of Media flow from the controller UE to itself by sending a SIP REFER request to the SCC AS outside the existing dialog as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] and include:

NOTE 1: Before requesting media flow transfer, the target UE of media transfer discovers the ongoing session with transferred media and gets information about its media flow by subscribing to dialog event.

1) the Request-URI set to the SIP URI of the local UE that currently holds the media for the session;

NOTE 2: The SIP URI of the local UE needs to be a GRUU if multiple UEs share the same public user identity.

2) The Refer-To header field set as follows:

a) The SIP URI of the Target UE;

NOTE 3: The SIP URI of Target UE needs to be a GRUU if the Target UE and any other UEs share the same public user identity.

b) the SIP URI additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session set as follows:

- Media lines which are not being transferred with the port numbers set to zero;
- Media lines which are to be transferred containing the port number of the Remote UE.

3) The Accept-Contact header field containing the g.3gpp.iut-focus media feature tag as described in annex B.3 with explicit and require tags; and

4) The Accept header field containing the MIME type "message/sipfrag"; and

5) The Target-Dialog header field containing the dialog parameters for the dialog of the existing session; and

NOTE 4: The dialog parameters are obtained by subscribing to the dialog event package.

6) The Referred-By header field containing a currently registered public user identity of the user.

## 19.2.5 Controllee UE initiated addition of media to another controllee UE

For requesting addition of media to another controllee UE, the requesting controllee UE sends a SIP REFER request to the controller UE. The SIP REFER request includes:

NOTE 1: Before requesting addition of media, the requesting controllee UE of addition of media discovers the ongoing collaborative session and gets information about its media flows by subscribing to dialog event.

1) the Request-URI set to the SIP URI of the controller UE in the ongoing collaborative session to be added media;

NOTE 2: The SIP URI of the controller UE needs to be a GRUU if the controller UE and any other UEs share the same public user identity.

2) the Refer-To header field set as follows:

a) the SIP URI of the target UE;

NOTE 3: The SIP URI of Target UE needs to be a GRUU if the Target UE and any other UEs share the same public user identity.

b) the SIP URI additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session set as follows:

- media lines which are not served by the target controllee UE and which are not being added with the port numbers set to zero;

- media lines which are already served by the target controllee UE, therefore are not to be added containing the port numbers of the remote UE; and
  - media line(s) that are to be added containing the media type(s) to be added and the discard port number "9".
- 3) the Accept-Contact header field containing the g.3gpp.iut-focus media feature tag as described in annex B.3 with explicit and require tags;
- 4) the Accept header field containing the MIME type "message/sipfrag";
- 5) the Target-Dialog header field containing the dialog parameters for the dialog of the existing session; and
- NOTE 4: The dialog parameters are obtained by subscribing to the dialog event package.
- 6) the Referred-By header field containing a currently registered public user identity of the user.

### 19.2.6 Inter-UE transfer solicited by a target UE without prior information about the existing sessions

For support of inter-UE transfer solicited by a target UE without prior information about the existing sessions:

- the UE shall implement the "application/pidf+xml" content type as described in RFC 3863 [47] and the PIDF extension specified in annex C.4 of this document.
- the UE shall subscribe for presence information state changes of the other UEs that are candidate UEs for inter UE transfer (see subclause 9.1) by generating for each candidate UE, a SUBSCRIBE request in accordance with RFC 6665 [48] and RFC 3856 [49], including:
  - a) the Request-URI set to the SIP URI of the candidate UE.

NOTE: The SIP URI of the controllee UE needs to be a GRUU if the candidate UE and any other UEs share the same public user identity.

- b) a filter in accordance with RFC 4661 [50] and RFC 4660 [51] which selects, via the <include> element, the element <IUT-solicitation >.
- the UE shall publish its presence status by generating a PUBLISH request, acting as an Event Publication Agent (EPA) in accordance with RFC 3903 [52], with the following precisions:
  - a) the UE shall include the class element set to "IUT" according to RFC 4480 [53].
  - b) if the UE has no wish to be the target of an IUT operation, the <status> element of the PIDF XML document shall contain the <basic> element set to "open" as defined in RFC 3863 [47].
  - c) when the UE wants to be the target of an IUT operation, the <status> element of the PIDF XML document shall contain the <IUT-solicitation> element as defined in annex C.4 that may contain:
    - i) one or more <mediaType> element if the UE wants to specify one or more type of media that it wants receive as a target of media transfer.
    - ii) the <sessionControl> element set to the value "true" if the UE wants to take the control of the collaborative session related to the transferred media(s).

then;

- i) if the UE receives multiple IUT transfer, as a target UE, it may decide to accept one or more IUT transfer; and
- ii) the UE shall update its presence status by including the <status> element of the PIDF XML document with the <basic> element set to "open" as defined in RFC 3863 [47].
- when the UE receives a NOTIFY request indicating presence information change of another UE status to "IUT-solicitation" i.e. containing the <IUT-solicitation> XML element:

- a) if the <IUT-solicitation> element contains one or more <mediaType> elements that indicates a media that the UE controls or no <mediaType> element is included in the <IUT-solicitation> element and the UE control one or media:
- if the < IUT-solicitation> element contains one or more <mediaType> elements that indicates one or more media that the UE controls or no <mediaType> element is included in the < IUT-solicitation>, the UE shall decide whether or not to transfer the solicited media(s). If the <IUT-solicitation> element contains the <sessionControl> element set to "true" and the UE decides to accept media transfer, the UE shall decide whether or not to transfer the corresponding collaborative session control. Then, if the UE decides to transfer one or media flow, it shall proceed the relevant IUT procedures to transfer the media to the soliciting UE as described in clauses 10, 11, and 12.

## 19.3 SCC AS

### 19.3.1 Media flows transfer initiated by a UE not participating in the ongoing collaborative session

On receiving the SIP REFER request, the SCC AS requests the controller UE to authorize the pull request or the SCC AS authorizes the request on behalf of the controller UE (e.g. pre-configured).

The SCC AS performs the steps as described in subclause 12.3.1, except that the SCC AS sends:

- a SIP INVITE request to the controllee UE to which the media component(s) is to be transferred (i.e. the target UE), instead of a SIP re-INVITE request; and
- the SIP 200 (OK) response and SIP and SIP NOTIFY request to the target UE instead of the controller UE.

### 19.3.2 Media flow transfer initiated by a UE not participating in the ongoing collaborative session - media on controllee UE

On receiving the SIP REFER request, the SCC AS requests the controller UE to authorize the pull request or the SCC AS authorizes the request on behalf of the controller UE (e.g. pre-configured).

The SCC AS performs the steps as described in subclause 12.3.2, except that the SCC AS sends:

- a SIP INVITE request to the controllee UE to which the media component(s) is to be transferred (i.e. the target UE), instead of a SIP re-INVITE request;
- the SIP 200 (OK) response and SIP NOTIFY request to the target UE instead of the controller UE.

### 19.3.3 Media flows transfer initiated when no collaborative session has been established

On receiving the SIP REFER request, the SCC AS requests the local UE to authorize the pull request or the SCC AS authorizes the request on behalf of local UE (e.g. pre-configured).

The SCC AS performs the steps as described in subclause 11.3.2, except that the SIP 200 (OK) response and SIP NOTIFY request are sent to the target UE instead of the local UE.

### 19.3.4 Media flows transfer initiated by a controllee UE of an ongoing collaborative session

On receiving the SIP REFER request, the SCC AS requests the local UE to authorize the pull request or the SCC AS authorizes the request on behalf of the local UE (e.g. pre-configured).

The SCC AS performs the steps as described in subclause 12.3.1, except that the SIP 200 (OK) response and SIP NOTIFY request are sent the target UE instead of the local UE.

### 19.3.5 Controllee UE initiated addition of media to another controllee UE

On receiving the SIP REFER, the SCC AS requests the controller UE to authorize the adding media request or the SCC AS authorizes the request on behalf of the controller UE (e.g. pre-configured).

The SCC AS performs the steps as described in subclause 14.3.1, except that the SIP 200 (OK) response and SIP NOTIFY request are sent to the UE that sent the SIP REFER request instead of the controller UE.

### 19.3.6 Inter-UE transfer solicited by a target UE without prior information about the existing sessions

The SCC AS shall implement the presence server functionality as specified in 3GPP TS 24.141 [46] and shall accept any subscription request from a UE to the presence information status having a filter selecting the <IUT-solicitation> element, in accordance with RFC 4661 [50] and RFC 4660 [51], of another UE that belongs to the same list of candidate UEs for inter-UE transfer (see subclause 9.1).

UE publications within the class "IUT" (according to RFC 4480 [53]) shall only be notified to UEs belonging to the same list of candidate UEs for inter-UE transfer (see subclause 9.1) and for a subscriptions containing a filter selecting the <IUT-solicitation>.

---

## 20 Roles for session replication / media replication performed by the SCC AS

### 20.1 General

The "3gpp.iut.replication" SDP attribute is used to indicate replication of a media component.

a = 3gpp.iut.replication

The replication attribute may be included either at the session level or at the media level. Inclusion of "a=3gpp.iut.replication" at the session level indicates replication of all media components included in the SDP. Inclusion of "a=3gpp.iut.replication" at the media level indicates replication of the specific media component that the attribute is associated with.

### 20.2 Session replication / media replication performed by the SCC AS – pull mode

#### 20.2.1 SC UE

In order to replicate an existing session, the UE shall send a SIP INVITE request to the SCC AS. The SIP INVITE request shall include:

NOTE 1: Before requesting replication, the UE discovers the ongoing collaborative session with the replicated media and gets information about its media flows by subscribing to the dialog event package.

- 1) the Request-URI set to the SIP URI of the controller UE in the ongoing collaborative session with transferred media;

NOTE 2: The SIP URI of the controller UE needs to be a GRUU if multiple UEs share the same public user identity.

- 2) the Accept-Contact header field containing the g.3gpp.iut-focus media feature tag with explicit and require tags;
- 3) the Target-Dialog header field containing the dialog parameters for the dialog of the ongoing collaborative session with the replicated media; and
- 4) SDP information as follows:



- a) for the replicated media component(s), containing the port numbers of the UE and the "a=3gpp.iut.replication" attribute which indicates that the replication request is sent from the controllee UE and it uses the network based solution;
- b) for the media component(s) served by the UE itself, containing the port numbers of the UE; and
- c) for the media component(s) not served by the UE, containing the port numbers set to zero.

Upon receiving the SIP 2xx response for the INVITE request from the SCC AS, the UE shall send a SIP ACK request to the SCC AS.

## 20.2.2 SCC AS serving the collaborative session

On receiving the SIP INVITE request, the SCC AS authorizes the request and sends information to the MRF to allocate the media resource for the media to be replicated. The MRF is requested to provide mixup functionality to support it.

If the SIP INVITE request has been authorized, the SCC AS shall send a SIP re-INVITE request to the controller UE to update the access leg on the controller UE for the replicated media flow with the MRF. The SIP re-INVITE request includes the SDP offer with the "a=3gpp.iut.replication" attribute.

Upon receiving a SIP 200 (OK) response with the SDP answer from the controller UE, the SCC AS shall send a SIP ACK request to the controller UE. After that, the SCC AS shall send a SIP re-INVITE request on the dialog for the remote leg to the remote UE to update the remote leg to communicate media with the MRF.

Upon receiving a SIP 200 (OK) response with the SDP answer on the remote leg, the SCC AS shall send a SIP ACK request on the remote leg.

## 20.3 Session replication / media replication performed by the SCC AS – push mode

### 20.3.1 SC UE

In order to replicate an existing session to another UE, the SC UE shall send a SIP REFER request as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] and include:

- 1) the Request-URI set to the inter UE Transfer SCC AS URI;
- 2) the Accept-Contact header field containing the g.3gpp.iut-focus media feature tag with explicit and require tags;
- 3) the Target-Dialog header field containing the dialog parameters for the dialog of the ongoing collaborative session with the replicated media; and
- 4) the Refer-To header field set as follows:
  - a) the SIP URI of the controllee UE; and

NOTE: The SIP URI of the controllee UE needs to be a GRUU if the controllee UE and any other UEs share the same public user identity.

- b) the SIP URI additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session set as follows:
  - media lines that are not being replicated with the port number set to zero; and
  - media line(s) that are to be replicated containing the "a=3gpp.iut.replication" attribute which indicates that the replication request was sent from the controller UE and it uses the network based solution.

Upon receiving a SIP re-INVITE request from the SCC AS, the UE shall send a SIP 200 (OK) response to the SCC AS to confirm the successful media update.

Upon receiving a SIP NOTIFY request from the SCC AS, the UE shall send a SIP 200 (OK) response to the SCC AS.

## 20.3.2 SCC AS serving the collaborative session

Upon receiving a SIP REFER request due to session replication, the SCC AS shall:

- 1) if not authorized, reject the SIP request with a SIP 403 (Forbidden) response and do not process the remaining steps;
- 2) send information to the MRF to allocate the media resource for the media to be replicated; and
- 3) send a SIP INVITE request to the controllee UE including:
  - a) the Request-URI with the SIP URI from the Refer-To header field of the received SIP REFER request; and
  - b) the SDP information as follows:
    - the media type(s) that are to be replicated from the media (m=) lines from the hname "body" URI header field in the SIP URI in the Refer-To header field of the received SIP REFER request and the "a=3gpp.iut.replication" attribute.

Upon receiving a SIP 200 (OK) response with the SDP answer from the controllee UE, the SCC AS shall send a SIP ACK request to the controllee UE. After that, the SCC AS shall send a SIP re-INVITE request to controller UE to update the access leg for the replicated media flow with the MRF.

---

# 21 Roles for session replication / media replication performed by the remote UE

## 21.1 General

This clause specifies the SC UE and SCC AS procedures for:

- the push mode session replication / media replication performed by the remote UE; and
- the pull mode session replication / media replication performed by the remote UE.

This solution:

- assumes that the existing dialog does not need to be indicated in session replication as all sessions established towards a URI of the remote UE provide the same media, e.g. an INVITE to a URI identifying a movie at an AS will always result to playback of the same movie.
- does not require extension of remote UE as playback state is exchanged between the SC UEs.

## 21.2 Session replication / media replication performed by the remote UE – pull mode

### 21.2.1 Introduction

This clause specifies the SC UE and SCC AS procedures for the pull mode session replication / media replication performed by the remote UE.

## 21.2.2 SC UE

### 21.2.2.1 SC UE not participating in the session to be replicated

#### 21.2.2.1.1 Triggering pull mode session replication

The SC UE shall fetch the dialog information of a UE as described in clause 15 and select an existing session for replication.

In order to replicate the session, the SC UE:

1. shall send a SIP INVITE request according to 3GPP TS 24.229 [7]. The SC UE shall populate the SIP INVITE request as follows:
  - A. the Request-URI is set to the remote URI (as defined in IETF RFC 3261 [30]) of the existing session; and
  - B. SDP offer containing the same media components as used in the existing session selected for replication.

#### 21.2.2.1.2 Requesting playback state

In order to get playback state from another UE participating in an existing session, the SC UE shall send a SIP REFER request as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] and 3GPP TS 24.229 [7]. The SC UE shall populate the SIP REFER request as follows:

1. the Request-URI set to the URI of the UE participating in the existing session;

NOTE 1: The URI of the UE needs to be a GRUU if several UEs share the same identity.

2. the Refer-To header field set to the own SIP URI extended with:

NOTE 2: The own SIP URI needs to be a GRUU if several UEs share the same identity.

- A. method parameter set to "MESSAGE"; and

- B. In-Reply-To URI header field set to the value of the Call-Id header field of the SIP REFER request;

3. the Target-Dialog header field set to the dialog identifier of the session whose playback state is to be provided;

NOTE 3: The dialog identifiers of sessions of other UEs can be found using dialog event package subscription.

4. the Require header field populated with the option tag value "tdialog"; and

5. application/vnd.3gpp.replication+xml MIME body containing the playback state parameters to be provided.

The SC UE receives the playback state upon receiving SIP MESSAGE request with:

1. In-Reply-To header field containing the call-id of the dialog of the subscription created by SIP REFER request; and
2. application/vnd.3gpp.replication+xml MIME body.

### 21.2.2.2 SC UE participating in the session to be replicated

#### 21.2.2.2.1 Providing playback state on request of other UE

Upon receiving SIP REFER request containing:

1. the Refer-To header field containing a SIP URI with method parameter equal to "MESSAGE";
2. the Target-Dialog header field containing the dialog identifier of an existing session with playback state; and
3. application/vnd.3gpp.replication+xml MIME body containing the playback state parameters to be provided;

then the SC UE shall handle the SIP REFER request as specified in 3GPP TS 24.229 [7] and IETF RFC 3515 [32] as updated by RFC 6665 [48]. The UE shall populate the SIP MESSAGE request with

1. header fields which were included as URI header fields in the URI in the Refer-To header field of the received SIP REFER request; and
2. application/vnd.3gpp.replication+xml MIME body containing the playback state of the session identified by Target-Dialog header field as requested in the application/vnd.3gpp.replication+xml MIME body included in the REFER request.

## 21.2.3 SCC AS

### 21.2.3.1 Distinction of requests sent to the SCC AS

The SCC AS needs to distinguish between the following SIP requests to provide specific functionality related to session replication:

1. SIP REFER request routed to the SCC AS due to the terminating filter criteria:
  - A. where the Refer-To header field contains a SIP URI with method parameter set to "MESSAGE"; and
  - B. containing application/vnd.3gpp.replication+xml MIME body.

In the procedures below, such request is known as "SIP REFER request for providing playback state".

Other SIP initial requests for a dialog and requests for a SIP standalone transaction can be dealt with in any manner conformant with 3GPP TS 24.229 [7].

### 21.2.3.2 Providing playback state on request of other UE

Upon receiving a SIP REFER request for providing playback state, the SCC AS shall:

1. if not authorized, reject the SIP request with a SIP 403 (Forbidden) response and do not process the remaining steps; and
2. forward the SIP REFER request in any manner conformant with 3GPP TS 24.229 [7].

## 21.3 Session replication / media replication performed by the remote UE – push mode

### 21.3.1 Introduction

This clause specifies the SC UE and SCC AS procedures for the push mode session replication / media replication performed by the remote UE.

### 21.3.2 SC UE

#### 21.3.2.1 SC UE participating in the session to be replicated

##### 21.3.2.1.1 Triggering push mode session replication request

In order to replicate an existing session of this SC UE to other UE, the SC UE shall send a SIP REFER request as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48] and 3GPP TS 24.229 [7]. The SC UE shall populate the SIP REFER request as follows:

1. the Request-URI set to the URI of the UE where the session is to be replicated;

NOTE: The URI of the UE needs to be a GRUU if multiple UEs share the same identity.

2. the Refer-To header field set:
  - A. if the asserted remote UE identity of the existing session is known, then to the asserted remote UE identity of the existing session; and
  - B. if the asserted remote UE identity of the existing session is not known, then to the remote URI (as defined in IETF RFC 3261 [30]) of the existing session;and extended with the following URI header fields:
  - A. if the session is established using an IMS communication service that requires the use of an IMS communication service identifier:
    - a. optionally the Accept-Contact header field with the g.3gpp.icsi-ref media feature tag containing the IMS communication service identifier of the existing session; and
    - b. the P-Preferred-Service header field set to the IMS communication service identifier of the existing session; and
  - B. SDP body listing the media as used in the existing session selected for replication; and
3. application/vnd.3gpp.replication+xml MIME body which optionally can include the playback state.

### 21.3.2.2 SC UE not participating in the session to be replicated

#### 21.3.2.2.1 Handling push mode session replication request

Upon receiving a SIP REFER request containing:

1. Refer-To header field containing a URI with method parameter equal to "INVITE" or without method parameter; and
2. application/vnd.3gpp.replication+xml MIME body,

NOTE: the application/vnd.3gpp.replication+xml MIME body can contain the playback state.

the SC UE:

1. shall handle the SIP REFER request as specified in 3GPP TS 24.229 [7] and IETF RFC 3515 [32] as updated by RFC 6665 [48].

### 21.3.3 SCC AS

#### 21.3.3.1 Distinction of requests sent to the SCC AS

The SCC AS needs to distinguish between the following SIP requests to provide specific functionality related to session replication:

1. SIP REFER request routed to the SCC AS due to the originating filter criteria containing:
  - A. Refer-To header field with a SIP URI with method parameter set to "INVITE" or without method parameter; and
  - B. application/vnd.3gpp.replication+xml MIME body.

In the procedures below, such request is known as "SIP REFER request due to session replication".

Other SIP initial requests for a dialog and requests for a SIP standalone transaction can be dealt with in any manner conformant with 3GPP TS 24.229 [7].

#### 21.3.3.2 Session replication from the served UE

Upon receiving a SIP REFER request due to session replication, the SCC AS shall:

1. if not authorized, reject the SIP request with a SIP 403 (Forbidden) response and do not process the remaining steps; and
2. forward the SIP REFER request in any manner conformant with 3GPP TS 24.229 [7].

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## 22 Roles for collaborative session handling upon loss of collaborative session control

### 22.1 Introduction

This clause specifies the roles of controller UE, controller capable UE and the SCC AS when collaborative session control is lost and collaborative session control is transferred to another UE.

### 22.2 SC UE

#### 22.2.1 Controller UE

The user may send or modify controller loss preference at any time during a session using XCAP over Ut interface. Candidate UEs in controller loss preference should be configured in a priority order.

NOTE: The controller UE can support the session timer mechanism as specified in IETF RFC 4028 [37] and 3GPP TS 24.229 [7] in order to aid the SCC AS detection of loss of collaborative session control.

#### 22.2.2 Controller capable UE

There are no additional procedures for the controller capable UE over those specified in subclause 18.2.2.

### 22.3 SCC AS

#### 22.3.1 Session handling upon controller loss

The following means may be used by the SCC AS to detect loss of collaborative session control:

- 1) the SCC AS receives a BYE message with a reason header 503 (Service Unavailable) response code;

NOTE: Since the SCC AS inserted itself in record-route header in IUT scenario, when radio/bearer resources are no longer available or the signalling bearer is lost to the UE for a session (e.g. abort session request from PCRF) (as specified in 18.229 [9] subclause 5.2.8.1.2), the SCC AS will receive a BYE message with a reason header 503 (Service Unavailable) response code.

- 2) the SCC AS detects a session timeout using the mechanism specified in IETF RFC 4028 [37] and 3GPP TS 24.229 [7].

- 3) the SCC AS receives a 5xx response for a subsequent request sent to the controller UE.

Upon detection of a loss of collaborative session control using one of the above mechanisms the SCC AS checks controller loss preference in the IUT user preferences (see annex C.3). If the <controller loss preferences> element is present, the SCC AS obtains the list of controller capable UEs in the <controller> elements to assume the controller UE role.

NOTE: The SCC AS can use subscription information to determine whether to enable selection of a new controller UE based on controller loss preference.

The SCC AS invites in turn according to the priority order of the <controller> elements in the <controller loss preference> each controller capable UE to become a controller of the collaborative session using the following procedure:

- 1) The SCC AS shall send a SIP INVITE request or SIP re-INVITE request to the UE identified by the SIP URI in the <controller> element, containing:
  - a) Request-URI with SIP URI from the <controller> element;
  - b) the P-Asserted-Identity header field containing the identity of the remote UE as received in the P-Asserted-Identity header field from the remote UE at the original session establishment; and
  - c) the Content-Type header field set to the value of "multipart/mixed"; and
  - f) a "multipart/mixed" MIME body containing the following MIME parts:
    - A) the SDP information for the media component to be transferred with the Content-Type set to "application/sdp" along with SDP for the media type for each of the media (m=) lines in the session set as follows:
      - media lines for media on other UEs other than UE that control is being transferred to with the port number set to zero
      - media line(s) for media on the UE that is requested to become a controller of the collaborative session containing the port numbers of the remote UE;
    - B) containing the Content-Type set to " application/vnd.3gpp.iut+xml " along with the handling parameter set to optional and the XML specified in annex C.2 containing a <controlTransfer> element containing a <targetController> element containing the SIP URI from the <controller> element;
- 2) If the SIP final response was a non 2xx response or if the Contact header field from the received SIP 2xx response does not contain the media feature tag g.3gpp current-iut-controller set to "active" then the SCC AS shall repeat the above procedure for the next controller capable UE in the list of <controller> elements in the <controller loss preference>.
- 3) Upon receiving a final response to the SIP INVITE request or SIP re-INVITE request which was sent towards the controller capable UE, the SCC AS shall:
  - a) send a SIP ACK request to the controller UE that sent the final response;
  - b) if the Contact header field from the received SIP 2xx response contains the media feature tag g.3gpp current-iut-controller set to "active" then consider the UE that sent the SIP 2xx response as the controller of the collaborative session.
- 4) If no suitable candidate controller capable UEs are left in the list of <controller> elements in the <controller loss preference>, then the SCC AS shall send SIP BYE request to all UEs participating in the session.

---

## 23 Roles for collaborative session media modification

### 23.1 Introduction

This clause specifies the procedures for collaborative session media modification including controller UE initiated media modification on controllee UE and controllee UE initiated media modification on itself.

### 23.2 Controller UE initiated media modification on controllee UE

#### 23.2.1 Controller UE

The controller UE procedures for modifying media on controllee UE by the controller UE is the same as the procedure described in subclause 11.2.2.1 with exception that the controller UE additionally sets the port numbers for the media types of the media components (in the hname "body" URI header field in the SIP URI in the Refer-To header field of

the SIP REFER request) which are being modified on the controllee UE to values from the corresponding media lines received during the last successful SDP offer and answer exchange with the remote party.

### 23.2.2 SCC AS serving for collaborative session

The SCC AS procedures for modifying media on controllee UE by the controller UE is the same as the procedure described in subclause 11.3.3.

## 23.3 Controllee UE initiated media modification on itself

### 23.3.1 Controllee UE

If the controllee UE wants to modify the characteristics of a media component on itself within a collaborative session, the controllee UE shall follow the procedures defined in 3GPP TS 24.229 [7] for modifying media.

### 23.3.2 SCC AS serving the collaborative session

When SCC AS receives a SIP re-INVITE request within an existing dialog from the controllee UE to modify a media component on itself, the SCC AS shall send a SIP re-INVITE request to the remote UE. The SCC AS shall construct the SDP information in the SIP re-INVITE request as follows:

- 1) set the media information of the media established in the controllee UE as the same in the SIP re-INVITE request received from the controllee UE; and
- 2) include the SDP information for all other media components in the collaborative session as received during the last successful SDP offer-answer exchange from the remote UE.

Upon receiving SIP 200 (OK) response with the SDP answer from the remote UE, the SCC AS shall send:

- 1) a SIP ACK request to the remote UE; and
- 2) a SIP 200 (OK) response to the controllee UE with an SDP answer that only contains the media component on the controllee UE.

---

## 24 Inter-UE transfer and MMTEL interactions

### 24.1 Introduction

This subclause describes the SCC AS and SC UE procedures for inter-UE transfer when execution of supplementary service as described in 3GPP TS 22.173 [2].

### 24.2 Originating Identification Presentation (OIP)

There are no specific procedures for the SC UE and the SCC AS for OIP besides the procedures described in 3GPP TS 24.607 [13].

### 24.3 Originating Identification Restriction (OIR)

There are no specific procedures for the SC UE and the SCC AS for OIR besides the procedures described in 3GPP TS 24.607 [13].



## 24.4 Terminating Identification Presentation (TIP)

There are no specific procedures for the SC UE and the SCC AS for TIP besides the procedures described in 3GPP TS 24.608 [14].

## 24.5 Terminating Identification Restriction (TIR)

There are no specific procedures for the SC UE and the SCC AS for TIR besides the procedures described in 3GPP TS 24.608 [14].

## 24.6 Communication Diversion (CDIV)

There are no specific procedures for the SC UE and the SCC AS for CDIV besides the procedures described in 3GPP TS 24.604 [10].

## 24.7 Communication Hold (HOLD)

The controller UE may hold an active media component(s) on itself, by following the procedures for HOLD described in 3GPP TS 24.610 [15].

The controller UE may hold or resume an active media component(s) on a controllee UE within a collaborative session while it has an ongoing IMS session with a remote UE, by sending a SIP REFER request and including:

- 1) the Request-URI set to the Inter UE Transfer SCC AS URI;
- 2) the Refer-To header as follows:
  - a) the SIP URI of the controllee UE;

NOTE: The SIP URI of the controllee UE needs to be a GRUU if the controllee UE and any other UEs share the same public user identity.

- b) the SIP URI additionally containing the URI header field with the hname "body" containing SDP for the media type for each of the media (m=) lines in the session shall be set as follows:
  - media lines for those media components that are not terminated on the controllee UE with port number zero;
  - media lines for those media components that are terminated on the controllee UE and are not to be changed with their current directionality and the current port number from the remote end; and
  - media lines for those media components that are terminated on the controllee UE and:
    - if those media components are to be held, set a-line to inactive or recvonly and the current port number from the remote end; or
    - if those media components are to be resumed, set a-line to sendonly or sendrecv and the current port number from the remote end.
- 3) the Accept header field set to "message/sipfrag"; and
- 4) the Target-Dialog header field populated as specified in IETF RFC 4538 [40], containing the dialog identifier of the collaborative session; and
- 5) the Contact header field containing the g.3gpp.iut-controller media feature tag as described in annex B.

The controller UE shall handle response to the SIP REFER request and the subsequent SIP NOTIFY requests according to 3GPP TS 24.229 [7].

When SCC AS receives a SIP REFER request from the controller UE to hold or resume a media component on a controllee UE, the SCC AS shall send:

- 1) a SIP 200 (OK) response for the SIP REFER request to the controller UE;
- 2) a SIP NOTIFY request with sipfrag including SIP 100 Trying to the controller UE; and
- 3) send a SIP re- INVITE request to the controllee UE, containing:
  - a) the Referred-By header field containing the values from the Referred-By header field of the received SIP REFER request according to the procedures of IETF RFC 3892 [36]; and
  - b) an SDP offer as received from remote UE in the previous offer/answer exchanged and with directionality as set for the corresponding media types in the hname "body" URI header field from the SIP URI in the Refer-To header field of the SIP REFER request received from the controller.

Upon receiving SIP 200 (OK) response from the controllee UE, the SCC AS shall send:

- 1) a SIP NOTIFY request to the controller UE with the sipfrag body including the SIP 200 (OK) response of the SIP re-INVITE request and also include the SDP information received from the controllee UE.
- 2) a SIP re-INVITE request to the remote leg as specified in 3GPP TS 24.229 [7]. The SCC AS shall construct the SDP information in the SIP re-INVITE request as follows:
  - set the SDP information including the directionality as received in the SIP 200 (OK) response from the controllee UE; and
  - include the SDP information for all other media components in the collaborative session as from the original session to the remote leg.

Upon receiving SIP 200 (OK) response with the SDP answer from the remote leg, the SCC AS shall send a SIP ACK request to the remote leg;

When a controllee UE receives a SIP re-INVITE request to hold a media component(s), it shall follow the procedures described in 3GPP TS 24.610 [15].

## 24.8 Communication Barring (CB)

There are no specific procedures for the SC UE and the SCC AS for CB besides the procedures described in 3GPP TS 24.611 [16].

## 24.9 Message Waiting Indication (MWI)

There are no specific procedures for the SC UE and the SCC AS for MWI besides the procedures described in 3GPP TS 24.606 [12].

## 24.10 Conference (CONF)

In a collaborative session, it shall only be possible for the controller UE to invoke the CONF service following the procedures as described in 3GPP TS 24.605 [11].

The controller UE of an existing collaborative session may be invited by the remote party or the conference AS to a conference using SIP REFER request. In this case, upon receiving a SIP REFER request from the remote party or the conference AS, the controller UE performs the same procedures as specified in subclause 24.11.2, and the SCC AS performs the same procedures as specified in subclause 24.11.3.

**NOTE:** The SIP URI in the Refer-To header field of the SIP REFER request received by the SCC AS is the conference URI, of which the SCC AS may not be aware. However, this does not affect the SCC AS procedures.

The controller UE may be invited by the conference AS to a conference using SIP INVITE request. In this case, upon receiving the SIP INVITE request from the conference AS, the controller UE and the SCC AS may perform the procedures as described in subclause 17.3 to establish a collaborative session with the conference AS. If there is an existing collaborative session between with the controller UE and the remote party, and the SIP INVITE request

indicates the collaborative session is to be replaced by the new session, the procedures as described in subclause 17.3 can be performed with the following difference:

- instead of sending a SIP INVITE request toward the controllee UE to establish a new access leg, the SCC AS may send a SIP re-INVITE request towards the controllee UE using the existing access leg between the controllee UE and the SCC AS, to update the SDP information over the access leg which has been bound to the new collaborative session.

## 24.11 Explicit Communication Transfer (ECT)

### 24.11.1 General

In a collaborative session, it shall only be possible for the controller UE to invoke ECT service following the procedures as described in 3GPP TS 24.629 [17].

When the controller UE receives a notification that ECT has been performed successfully, the controller UE shall terminate the previous active session with the transferee UE by terminating all related media control sessions on the controllee UEs.

When the SCC AS receives an ECT transfer request from the remote end to transfer the collaborative session, the SCC AS shall deliver the request to the controller UE.

When the controller UE receives an ECT transfer request to transfer the collaborative session, if the controller UE decides not to continue using a collaborative session to communicate with the new remote party (i.e. transfer target), the controller UE shall establish a new session towards the transfer target following the procedures described in 3GPP TS 24.629 [17].

### 24.11.2 SC UE

As the transferor of the ECT service, only the controller UE can invoke the ECT service on behalf of the collaborative session and it shall send a SIP REFER request to the transferee as specified in TS 24.629 [25]. Upon receiving notification that ECT has been performed successfully, the controller UE shall terminate the previous active session with the transferee UE by terminating all related media control sessions on the controllee UEs.

Upon receiving a SIP REFER request within an existing collaborative session containing:

- 1) the Referred-By header field set to the URI of the remote party; and
- 2) the Refer-To header field containing the "method" URI parameter set to INVITE or not including the "method" URI parameter,

the controller UE, if decides to continue using a collaborative session to communicate with the new remote party (i.e. transfer target), may send to the SCC AS a SIP INVITE request including:

- 1) the Request-URI set to the URI in the Refer-To header field of the SIP REFER request; and
- 2) the SDP information as follows:
  - for the media component(s) that are to be established in the controller UE, containing the port number(s) of the controller UE; and
  - for the media component(s) that are to be established in the controllee UE, containing the "a=3gpp.iut.controllee" attribute set to the same SIP URI of controllee UE as in the original collaborative session.

The following procedures of the controller UE for establishing the collaborative session with the transfer target is the same as described in subclause 17.2.1.

### 24.11.3 SCC AS

Upon receiving from the remote party a SIP REFER request in the existing dialog for which a collaborative session is established in the local party, the SCC AS shall forward the SIP REFER request towards the controller UE using the procedures as specified in TS 24.229 [9].

Upon receiving a SIP INVITE request from the controller UE due to the SIP REFER request and the SIP INVITE request includes:

- 1) the Request-URI set to the URI in the Refer-To header field of the SIP REFER request; and
- 2) the SDP information as follows:
  - for the media component(s) that are to be established on the controller UE containing the port number(s) of the controller UE; and
  - for the media component(s) that are to be established in the controllee UE, containing the "a=3gpp.iut.controllee" attribute set to the same SIP URI of controllee UE as in the original collaborative session,

and if required by local policy, the SCC AS shall establish a new collaborative session towards the new remote party (i.e. transfer target), using the procedure as described in subclause 17.2.2 with the following difference:

- instead of sending a SIP INVITE request toward the controllee UE to establish a new access leg, the SCC AS may send a SIP re-INVITE request towards the controllee UE using the existing access leg between the controllee UE and the SCC AS, to update the SDP information over the access leg which has been bound to the new collaborative session.

NOTE 1: The SCC AS can not distinguish the SIP REFER request for ECT from the common SIP REFER request. However this does not affect the SCC AS procedures, i.e. the SCC AS can decide, based on the SIP INVITE request from the controller UE due to the SIP REFER request, to reuse the existing access leg of the controllee UE for the new collaborative session.

NOTE 2: The SCC AS can decide the duration that it keeps the information of the SIP REFER request based on, e.g. the expiration time of the SIP REFER request (the Expires header field in the REFER request) and the duration of the implicit subscription created by the SIP REFER request ("expires" header field parameter in the Subscription-State header field in the first NOTIFY sent in the subscription) as specified in IETF RFC 3515 [32] as updated by RFC 6665 [48], so that the SIP INVITE request from controller UE can be associated with the SIP REFER request.

### 24.12 Advice of Charge (AOC)

When the AOC service specified in 3GPP TS 24.647 [23] is active, the SCC AS shall deliver charging information to the controller UE.

### 24.13 Closed User Groups (CUG)

There are no specific procedures for the SC UE and the SCC AS for CUG besides the procedures described in 3GPP TS 24.654 [24].

### 24.14 Three-Party (3PTY)

The 3PTY service is considered as a special case of CONF service in 3GPP TS 24.605 [11] and the interaction with inter-UE transfer is the same as that specified in subclause 24.2.10 for CONF service.

### 24.15 Flexible Alerting (FA)

There are no specific procedures for the SC UE and the SCC AS for FA besides the procedures described in 3GPP TS 24.239 [18].

## 24.16 Communication Waiting (CW)

There are no specific procedures for the SC UE and the SCC AS for CW besides the procedures described in 3GPP TS 24.615 [20].

## 24.17 Completion of Communications to Busy Subscriber (CCBS)/Completion of Communications by No Reply (CCNR)

There are no specific procedures for the SC UE and the SCC AS for CCBS/CCNR besides the procedures described in 3GPP TS 24.642 [22].

## 24.18 Customized Alerting Tones (CAT)

For Collaborative Sessions established concurrently with terminating IMS session setup, the CAT provided by the network (under the control of the SCC AS associated with the controller UE) to the remote party is the CAT associated with the controller UE.

## 24.19 Malicious Communication IDentification (MCID)

There are no specific procedures for the SC UE and the SCC AS for MCID besides the procedures described in 3GPP TS 24.616 [21].

## 24.20 Personal Network Management (PNM)

There are no specific procedures for the SC UE and the SCC AS for PNM besides the procedures described in 3GPP TS 24.259 [19].

## 24.21 Customized Ringing Signal (CRS)

For Collaborative Sessions established concurrently with terminating IMS session setup, the Customized Ringing Signal (CRS) provided to the controller UE is the CRS associated with the remote party. For Collaborative Sessions established concurrently with originating IMS session setup, the CRS provided to the remote party is the CRS associated with the controller UE.

# Annex A (informative): Example signalling flows

## A.1 Scope of signalling flows

This annex gives examples of signalling flows for inter-UE transfer based on the Session Initiation Protocol (SIP) and SIP Events.

These signalling flows provide detailed signalling flows, which expand on the overview information flows provided in 3GPP TS 23.237 [4].

## A.2 Introduction

### A.2.1 General

The signalling flows provided in this annex follow the methodology developed in 3GPP TS 24.228 [6].

### A.2.2 Key required to interpret signalling flows

The key to interpret signalling flows specified in 3GPP TS 24.228 [6] subclauses 4.1 and 4.2 applies with the additions specified below:

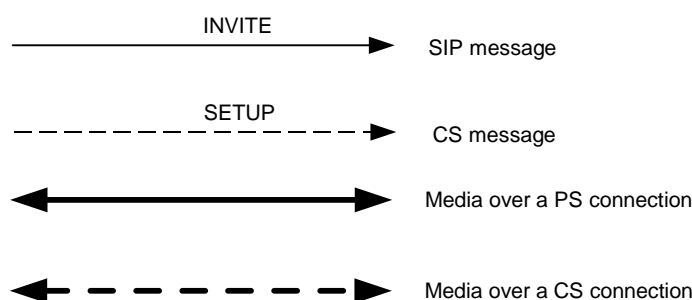
- tel:+1-237-555-1111 represents the public user identity of SC UE A.
- tel:+1-237-555-2222 represents the public user identity of UE B.
- sip:sccas1.home1.net represents the Internet host of SCC AS.
- sip:interUEtransfer@sccas1.home1.net represents the Inter UE Transfer SCC AS URI of the UA A.

Each signalling flow table contains descriptions for headers where the content of the header is new to that signalling flow, as is already performed in 3GPP TS 24.228 [6].

However, 3GPP TS 24.228 [6] includes extensive descriptions for the contents of various headers following each of the tables representing the contents of the signalling flows. Where the operation of the header is identical to that shown in 3GPP TS 24.228 [6], 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 [6] in addition to the material shown in the present document.

In order to differentiate between messages for SIP and media, the notation in figure A.2-1 is used.



**Figure A.2-1: Signalling flow notation**

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## A.3 Signalling flows for Inter-UE Transfer without establishment of Collaborative Session

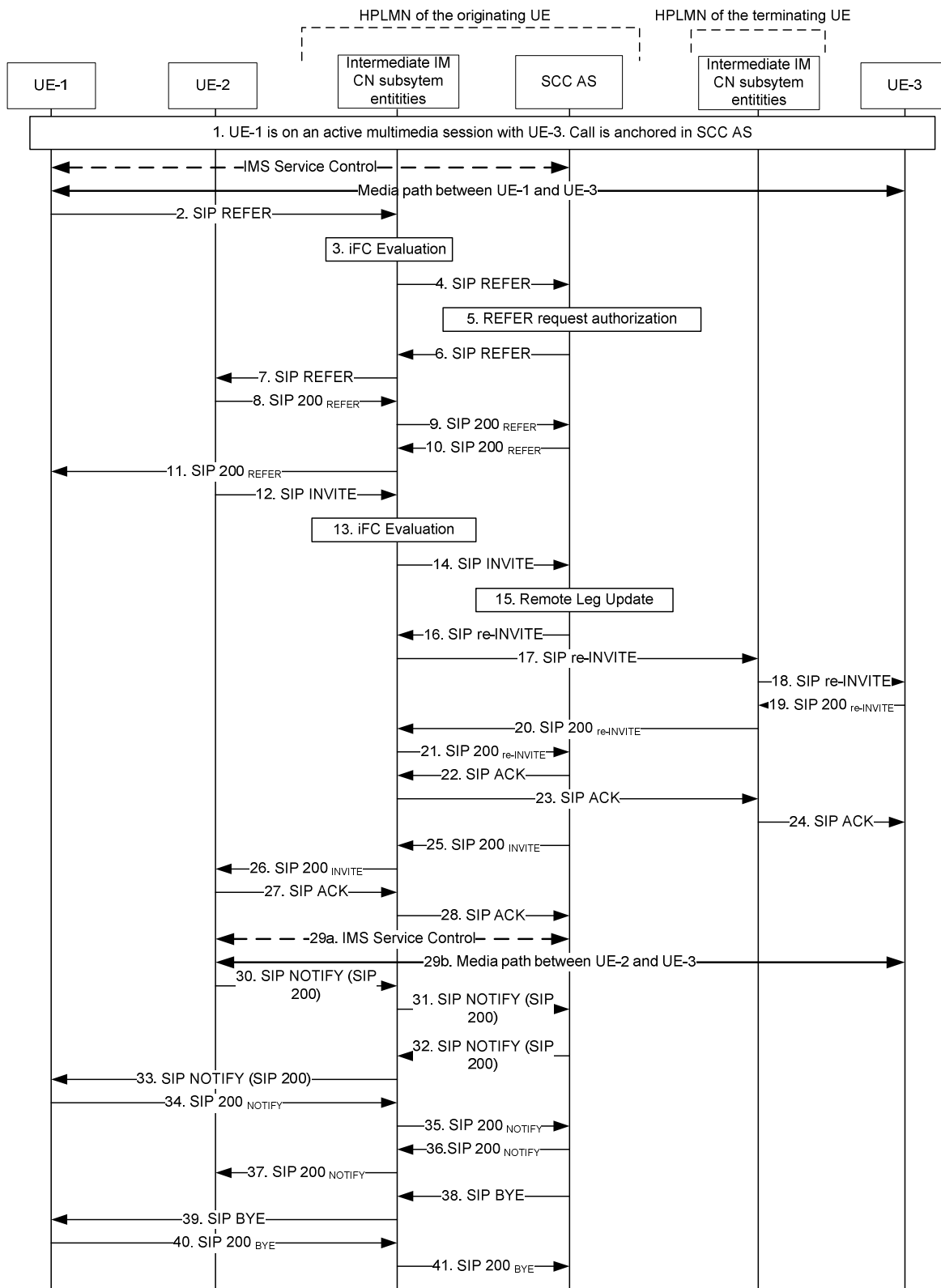
### A.3.1 Introduction

The signalling flows in the subclause demonstrate how an SC UE can initiate the inter UE transfer of the complete session without Collaborative Session establishment.

The example assumes that the UE-1 and UE-2 are under the control of the same subscriber.

### A.3.2 Complete transfer in services defining only originating session set up in UE

In the example flow at the figure A.3.2-1, UE-1 has an ongoing multimedia session with UE-3 anchored at SCC AS. The session is established using an IMS communication service identified by ICSI urn:urn-7:3gpp-service.ims.icsi.iptv which is an IMS communication service which defines originating session set up in the UE only.



**Figure A.3.2-1: Signalling flow for inter UE transfer without Collaborative Session establishment**

NOTE 1: For clarity, the SIP 100 (Trying) responses and the SIP NOTIFY requests carrying the message/sipfrag with SIP 100 (Trying) response are not shown in the signalling flow.

**1. UE-1 is in session with UE-3**



There is a multimedia session comprising audio and video media between the UE-1 and the remote UE-3 anchored at SCC AS. The session was established using IMS communication service identified by ICSI urn:urn-7:3gpp-service.ims.icsi.iptv. The dialog identifier of the session is AB03a0s09a2sdfglkj490333, remote-tag=Afgsdfg45, local-tag=U188gg.

**2. SIP REFER request initiating the inter UE transfer to UE-2 (UE-1 to Intermediate IM CN subsystem entities) - see example in table A.3.2-2**

**Table A.3.2-2: SIP REFER request (UE-1 to Intermediate IM CN subsystem entities)**

```
REFER sip:user@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-222222222222 SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Preferred-Identity: <sip:user@home1.net>
From: <sip:user@home1.net>;tag=171828
To: <sip:user@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-222222222222>
Call-ID: Asdasd231233
Cseq: 4127 REFER
Contact: <sip:user@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-111111111111>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Length: 0
Refer-To: <sip:interUEtransfer@sccas.home1.net?Target-Dialog=AB03a0s09a2sdfglkj490333%3Bremote-tag=Afgsdfg45%3Blocal-tag=U188gg&Require=tdialog&P-Preferred-Service=urn:urn-7:3gpp-service.ims.icsi.iptv&Accept-Contact=%3b+g.3gpp.icsi-ref%3d%22urn%253Aurn-7%253gpp-service.ims.icsi.iptv%22>
Referred-By: sip:user@home1.net
```

**Request-URI:** contains the GRUU of the UE-2

**Refer-To:** contains the Inter UE Transfer SCC AS URI together with Target-Dialog URI header field containing the dialog identifier of the session with UE-3, Require URI header field containing the "tdialog" and P-Preferred-Service and Accept-Contact URI header fields containing the ICSI of the service to be requested by UE-2.

**Contact:** contains the GRUU of the UE-1

**3. Evaluation of initial filter criteria**

The S-CSCF evaluates originating initial filter criteria for the served user and as a result routes the SIP REFER request towards the SCC AS.

**4. SIP REFER request (Intermediate IM CN subsystem entities to SCC AS)**

**5. The SCC AS authorizes the request and if authorization is passed successfully, the SCC AS forwards the SIP REFER request further**

**6-7. SIP REFER request (SCC AS to UE-2)**

**8-11. SIP 200 (OK) response to the SIP REFER request (UE-2 to UE-1)**

**12. SIP INVITE request (UE-2 to intermediate IM CN subsystem entities) - see example in table A.3.2-12**

**Table A.3.2-12: SIP INVITE request (UE-1 to Intermediate IM CN subsystem entities)**

```

INVITE sip:interUEtransfer@sccas.homel.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:fff]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Preferred-Identity: <sip:user@homel.net>
From: <sip:user@homel.net>;tag=171828
To: <sip:interUEtransfer@sccas.homel.net>
Call-ID: tq34gasgaegr
Cseq: 4127 INVITE
Contact: <sip:user@homel.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-222222222222>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Target-Dialog: AB03a0s09a2sdfglkj490333;remote-tag=Afgsdfg45;local-tag=U188gg
Require: tdialog
Content-Type: application/sdp
Content-Length: (...)
Supported: 100rel, precondition
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.iptv
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3gpp-service.ims.icsi.iptv"
Referred-By: sip:user@homel.net

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:fff
s=
c=IN IP6 5555::aaa:bbb:ccc:fff
t=0 0
m=audio 3456 RTP/AVP 97 96
a=tcap:1 RTP/AVPF
a=pcfg:1 t=1
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:96 telephone-event
a=maxptime:20
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=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**Request-URI:** set to the URI in the Refer-To of the received SIP REFER request

**Contact:** contains the GRUU of the UE-2

**Target-Dialog:** set to the value of the Target-Dialog URI header field of the URI in the Refer-To of the received SIP REFER request

**Require:** set to the value of the Require URI header field of the URI in the Refer-To of the received SIP REFER request

**P-Preferred-Service:** set to the value of the P-Preferred-Service URI header field of the URI in the Refer-To of the received SIP REFER request

**Accept-Contact:** set to the value of the Accept-Contact URI header field of the URI in the Refer-To of the received SIP REFER request

### 13. Evaluation of initial filter criteria

The S-CSCF evaluates originating initial filter criteria for the served user and as a result routes the SIP INVITE request towards the SCC AS.

### 14. SIP INVITE request (Intermediate IM CN subsystem entities to SCC AS)

### 15. Remote Leg Update

Based on the STI in the Target-Dialog header field the SCC AS detects that the inter UE transfer is being attempted and performs the Remote Leg update by sending the SIP re-INVITE request towards the remote UE.

**16-18. SIP re-INVITE request (SCC AS to UE-3 over intermediate IM CN subsystem entities)**

The SCC AS acting as a routing B2BUA generates a SIP re-INVITE request based upon the received SIP INVITE request and the information previously stored against this session and routes it towards UE-3 via the intermediate IM CN subsystem entities.

**19-21. SIP 200 (OK) response (UE-3 to intermediate IM CN subsystem entities)**

Upon receiving the SIP re-INVITE request containing the SDP offer, since the UE-3 has all resources available, it sends immediately the SIP 200 (OK) response to the SIP re-INVITE request that contains the SDP answer. The SDP answer indicates that the resources are available.

**22-24. SIP ACK request (SCC AS to UE-3 via intermediate IM CN subsystem entities)**

The SCC AS generates the SIP ACK request to the SIP 200 (OK) response, and forwards the SIP ACK request to the remote UE-3.

**25-26. SIP 200 (OK) response (SCC AS to UE-2 via intermediate IM CN subsystem entities)**

The SCC AS generates the SIP 200 (OK) response to the SIP INVITE request, and forwards the SIP 200 (OK) response towards the UE-2.

**27-28. SIP ACK request (UE-2 to SCC AS via intermediate IM CN subsystem entities)**

The UE-2 generate the SIP ACK request to the SIP 200 (OK) response, and forward it to the SCC AS.

**29. Media and IMS service control paths:**

The media path is now established between UE-2 and UE-3 and the IMS service control between UE-2 and SCC AS.

**30-33. SIP NOTIFY request (UE-2 to UE-1 over intermediate IM CN subsystem entities and SCC AS)**

The UE-2 generate the SIP NOTIFY request carrying the message/sipfrag body and send it towards UE-1.

**34-37. SIP 200 OK response to the SIP NOTIFY request (UE-1 to UE-2 over intermediate IM CN subsystem entities and SCC AS)**

**38-39: SIP BYE request (SCC AS to UE-1 via intermediate IM CN subsystem entities)**

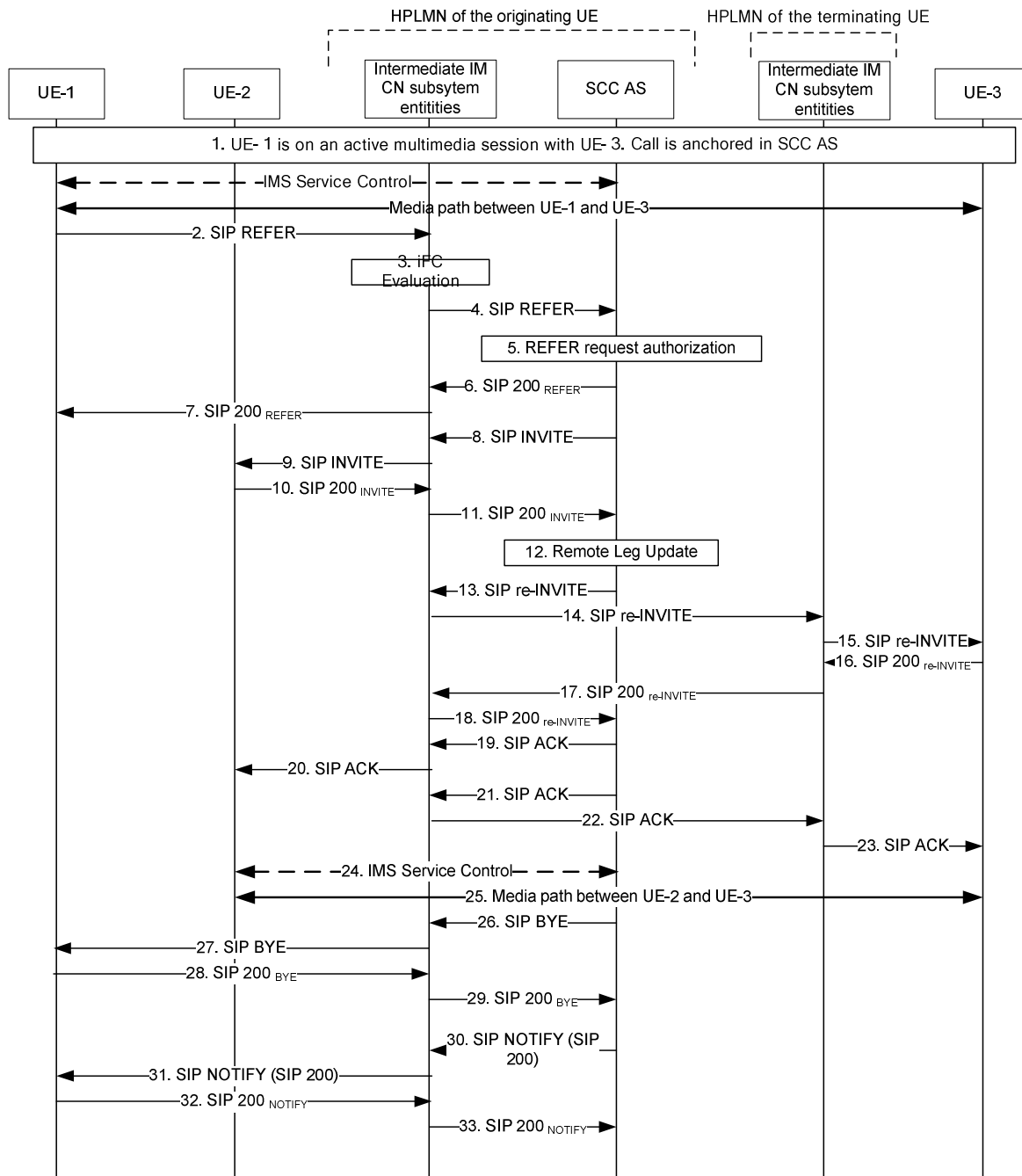
The SCC AS terminates the source access leg by sending a BYE request to the UE-1.

**40-41. SIP 200 (OK) response (UE-1 to SCC AS via intermediate IM CN subsystem entities)**

Upon receiving the SIP BYE request, the UE-1 sends a SIP 200 (OK) response to the SCC AS. Subsequently, the UE-1 relinquishes all resources pertaining to the session.

### A.3.3 Complete transfer in services defining terminating session set up in UE

The signalling flow in figure A.3.3-1 describes the procedures for complete transfer in services defining terminating session set up in UE. UE-1 has an ongoing multimedia session with UE-3 anchored at the SCC AS. UE-1 initiate the inter UE transfer of the complete session to UE-2 without collaborative session establishment. This transferred session is an IMS communication service session which can be established by termination session set up in UE-2.



**Figure A.3.3-1: Signalling flow for complete transfer in services defining terminating session set up in UE**

NOTE 1: For clarity, the SIP 100 (Trying) responses and the SIP NOTIFY requests carrying the message/sipfrag with SIP 100 (Trying) response are not shown in the signalling flow.

**1. UE-1 is in session with UE-3**

There is a multimedia session comprising audio and video media between the UE-1 and the remote UE-3 anchored at SCC AS. The dialog identifier of the session is AB03a0s09a2sdfglkj490333, remote-tag=Afgsdfg45, local-tag=U188gg.

**2-4. SIP REFER request initiating the inter UE transfer to UE-2 (UE-1 to SCC AS)**

**Table A.3.3-2: SIP REFER request (UE-1 to Intermediate IM CN subsystem entities)**

```

REFER sip:interUEtransfer@sccas.homel.net SIP/2.0
Via: SIP/2.0/UDP 123.45.67.89:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Preferred-Identity: <sip:user@homel.net>
From: <sip:user@homel.net>;tag=171828
To: <sip:interUEtransfer@sccas.homel.net>
Call-ID: Asdasd231233
Cseq: 4127 REFER
Contact: <sip:user@homel.net;gr=gr=urn:uuid:f81d4fae-7dec-11d0-a765-111111111111>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Length: 0
Target-dialog:AB03a0s09a2sdfglkj490333;remote-tag= Afgsdfg45;local-tag= U188gg
Refer-To: <sip:user@homel.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-222222222222?P-Preferred-
Service= urn%3Aurn-7%3A3gpp-service.ims.icsi.mmtel&Accept-Contact=%*3b+g.3gpp.icsi-
ref%3d%22urn-7%253gpp-service.ims.icsi.mmtel%22>
Referred-By: sip:user@homel.net

```

Request-URI: contains the Inter UE Transfer SCC AS URI

Refer-To: contains the contains the GRUU of the UE-2 together with P-Preferred-Service and Accept-Contact URI header fields containing the ICSI of the service to be requested by SCC AS.

NOTE: P-Preferred-Service and Accept-Contact URI may not be included if the IMS communication service is multimedia telephony services,

Target-dialog: contains the dialog identifier of the session with UE-3

Contact: contains the GRUU of the UE-1

### 5. The SCC AS authorizes the request

### 6-7. SIP 200 (OK) response to the SIP REFER request (SCC AS to UE-1)

### 8-9. SIP INVITE request (SCC AS to UE-2)

**Table A.3.3-8: SIP INVITE request (SCC AS to UE-2)**

```

INVITE sip:user@homel.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-222222222222 SIP/2.0
Via: SIP/2.0/UDP sccas.homel.net; branch=z9hG4bK332b33.3;
Max-Forwards: 70
From:<sip:interUEtransfer@sccas.homel.net>; tag=171828
To: <sip:user@homel.net>;
Call-ID: tq34gasgaegr
Cseq: 4127 INVITE
Contact: <sip:interUEtransfer@sccas.homel.net>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)
Supported: 100rel, precondition
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.mmtel
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.mmtel"
Referred-By: sip:user@homel.net

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=
c= IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

Request-URI: set to the URI in the Refer-To of the received SIP REFER request

Contact: contains the Inter UE Transfer SCC AS URI

P-Preferred-Service: set to the value of the P-Preferred-Service URI header field of the URI in the Refer-To of the received SIP REFER request

Accept-Contact: set to the value of the Accept-Contact URI header field of the URI in the Refer-To of the received SIP REFER request

### 10-11. SIP 200 (OK) response (UE-2 to SCC AS)

The UE-2 generate the the SIP 200 (OK) response to the SIP INVITE request, and forward it to the SCC AS.

**Table A.3.3-10: SIP 200 (OK) response (UE-2 to SCC AS)**

```
SIP/2.0 200 OK
Via:
To: sip<sip:user@home1.net>; tag=36527
From: <sip:interUEtransfer@sccas.home1.net>; tag=171828
Call-ID: tq34gasgaegr
CSeq:
P-Preferred-Identity:
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 IP4 123.112.67.87
s=
c= IN IP4 IP4 123.112.67.87
t=0 0
m=audio 1300 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

## 12. Remote Leg Update

Based on the received SDP from UE-2, SCC AS performs the Remote Leg update by sending the SIP re-INVITE request towards the remote UE.

### 13-15. SIP re-INVITE request (SCC AS to UE-3)

The SCC AS acting as a routing B2BUA generates a SIP re-INVITE request based upon the received SIP INVITE request and the information previously stored against this session and routes it towards UE-3 via the intermediate IM CN subsystem entities.

**Table A.3.3-13: SIP INVITE request (SCC AS to remote UE)**

```
INVITE sip:user2@home1.net; SIP/2.0
Via:
To: sip:user2@home1.net;tag= U188gg
From: sip:user1@home1.net;tag= Afgsdfg45
Call-ID: AB03a0s09a2sdfglkj490333
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: <sip:interUEtransfer@sccas.home1.net>
Allow:
Content-Type: application/sdp
Content-Length: (...)
```

```

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
t=0 0
c=IN IP4 123.112.67.87
m=audio 1300 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

#### 16-18. SIP 200 (OK) response (UE-3 to SCC AS)

Upon receiving the SIP re-INVITE request containing the SDP offer, since the UE-3 has all resources available, it sends immediately the SIP 200 (OK) response to the SIP re-INVITE request that contains the SDP answer. The SDP answer indicates that the resources are available.

#### 19-20. SIP ACK request (SCC AS to UE-2)

The SCC AS generates the SIP ACK request to the SIP 200 (OK) response, and forwards the SIP ACK request to the target UE, UE-2.

#### 21-23. SIP ACK request (SCC AS to UE-3)

The SCC AS generates the SIP ACK request to the SIP 200 (OK) response, and forwards the SIP ACK request to the remote UE-3.

#### 24-25. Media and IMS service control paths:

The media path is now established between UE-2 and UE-3 and the IMS service control between UE-2 and SCC AS.

#### 26-27: SIP BYE request (SCC AS to UE-1)

The SCC AS terminates the source access leg by sending a BYE request to the UE-1.

#### 28-29. SIP 200 (OK) response (UE-1 to SCC AS)

Upon receiving the SIP BYE request, the UE-1 sends a SIP 200 (OK) response to the SCC AS. Subsequently, the UE-1 relinquishes all resources pertaining to the session.

#### 30-31. SIP NOTIFY request (SCC AS to UE-1)

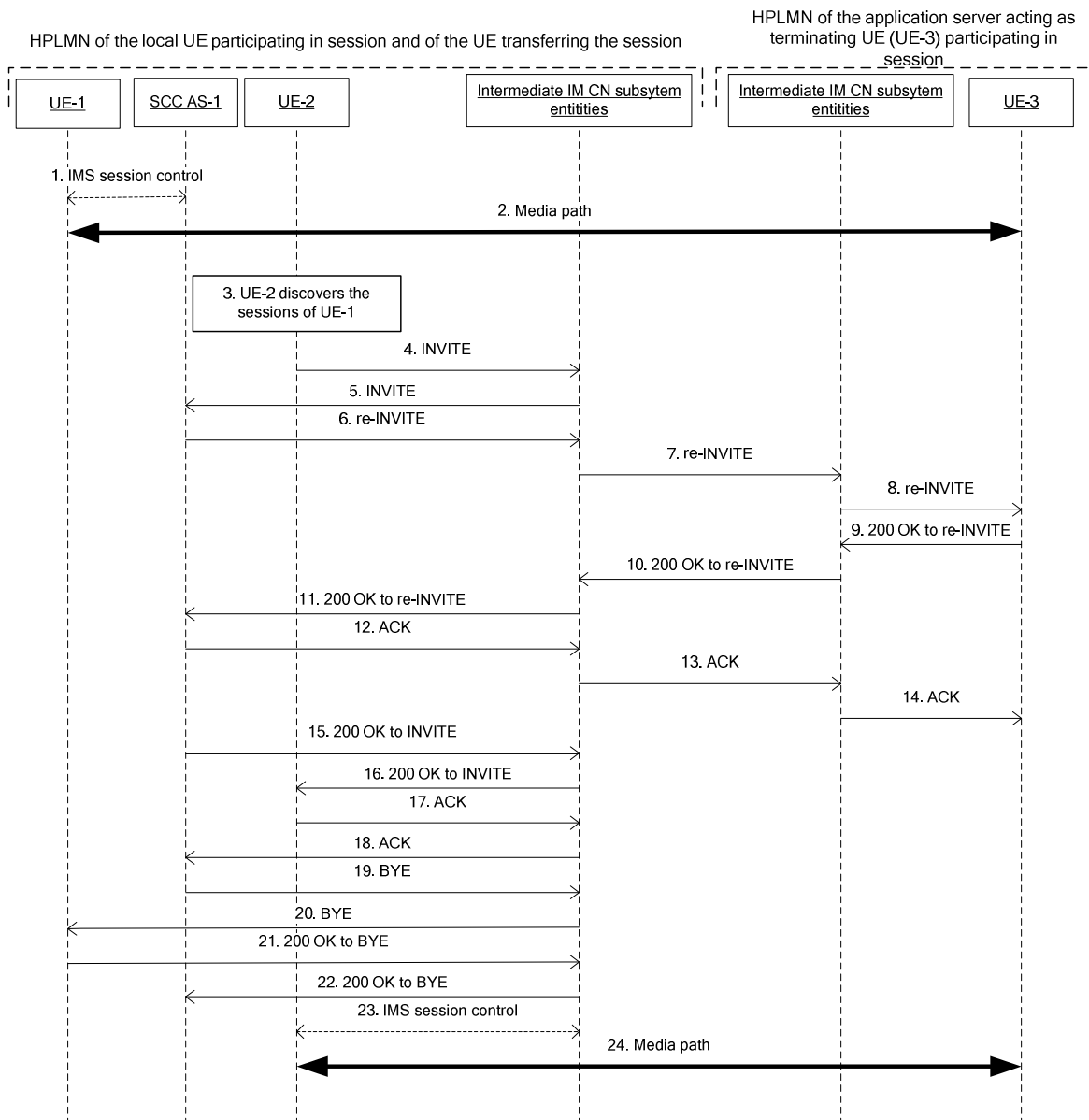
The SCC AS generate the SIP NOTIFY request carrying the message/sipfrag body and send it towards UE-1.

#### 32-33. SIP 200 (OK) response(UE-1 to SCC AS)

SIP 200 OK response to the SIP NOTIFY request (UE-1 to UE-2 over intermediate IM CN subsystem entities and SCC AS)

## A.3.4 Inter UE transfer triggered by SC UE not participating in the session to be transferred

In the example flow at the figure A.3.4-1, UE-1 has an ongoing multimedia session with UE-3 anchored at SCC AS-1. UE-1 and UE-2 belong to the same IMS subscriptions. The SCC AS-1 authorizes the inter UE transfer request on behalf of the UE-1.



**Figure A.3.4-1: Signalling flow for inter UE transfer without collaborative session establishment triggered by UE not participating in the session**

NOTE: For clarity, the SIP 100 (Trying) messages are not shown in the signalling flow.

**1-2. UE-1 is in session with UE-3**

There is a multimedia session comprising audio and video media between the UE-1 and the remote UE-3 anchored at SCC AS-1. The dialog identifier of the session between SCC AS-1 and UE-1 is AB03a0s09a2sdfglkj490333, remote-tag=dfg45, local-tag=444.

**3. UE-2 discovers the sessions of UE-1 as shown in subclause A.23**

**4-5. SIP INVITE request (UE-2 to SCC AS-1) - see example in table A.3.4-4**

The UE-2 sends SIP INVITE request to transfer the session to the UE-2.



**Table A.3.4-4: SIP INVITE request**

```

INVITE sip:interUEtransfer@sccas.homel.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:fff]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Preferred-Identity: <sip:user2@homel.net>
From: <sip:user2@homel.net>;tag=171828
To: <sip:interUEtransfer@sccas.homel.net>
Call-ID: tq34gasgaegr
Cseq: 4127 INVITE
Contact: <sip:user2@homel.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222>;+g.3gpp.icsi-
    ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.iptv"
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Replaces: AB03a0s09a2sdfglkj490333;remote-tag=dfg45;local-tag=444
Require: replaces
Content-Type: application/sdp
Content-Length: (...)
Supported: 100rel, precondition, 199

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:fff
s=
c=IN IP6 5555::aaa:bbb:ccc:fff
t=0 0
m=audio 3456 RTP/AVP 97 96
a=tcap:1 RTP/AVPF
a=pcfg:1 t=1
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:96 telephone-event
a=maxptime:20
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=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**Request-URI:** contains the Inter UE Transfer SCC AS URI

**Replaces:** set to the dialog information of the session to be transferred

#### 6.8. SIP re-INVITE request (SCC AS-1 to UE3)

Since the request is addressed to SCC AS-1 and since STI in the Replaces header field identifies an dialog anchored in the SCC AS-1, the SCC AS-1 detects that the inter UE transfer is being attempted, authorizes the request of behalf of UE-1, acts as a routing B2BUA and performs remote leg update by sending the SIP re-INVITE request towards the UE-3.

#### 9.11. SIP 200 (OK) response (UE-3 to intermediate IM CN subsystem entities)

Upon receiving the SIP re-INVITE request containing the SDP offer, since the UE-3 has all resources available, it sends immediately the SIP 200 (OK) response to the SIP re-INVITE request that contains the SDP answer. The SDP answer indicates that the resources are available.

#### 12.14. SIP ACK request (SCC AS-1 to UE-3 via intermediate IM CN subsystem entities)

The SCC AS-1 generates the SIP ACK request to the SIP 200 (OK) response, and forwards the SIP ACK request to the remote UE-3.

#### 15.16. SIP 200 (OK) response (SCC AS-1 to UE-2 via intermediate IM CN subsystem entities)

The SCC AS-1 generates the SIP 200 (OK) response to the SIP INVITE request, and forwards the SIP 200 (OK) response towards the UE-2.

**17-18. SIP ACK request (UE-2 to SCC AS-1 via intermediate IM CN subsystem entities)**

The UE-2 generates the SIP ACK request to the SIP 200 (OK) response.

**19-20. SIP BYE request (SCC AS-1 to UE-1 via intermediate IM CN subsystem entities)**

The SCC AS-1 terminates the source access leg by sending a BYE request to the UE-1.

**21-22. SIP 200 (OK) response (UE-1 to SCC AS-1 via intermediate IM CN subsystem entities)**

Upon receiving the BYE request, the UE-1 sends a SIP 200 (OK) response. Subsequently, the UE-1 releases all resources pertaining to the session.

**23-24. UE-2 is now in session with UE-3**

---

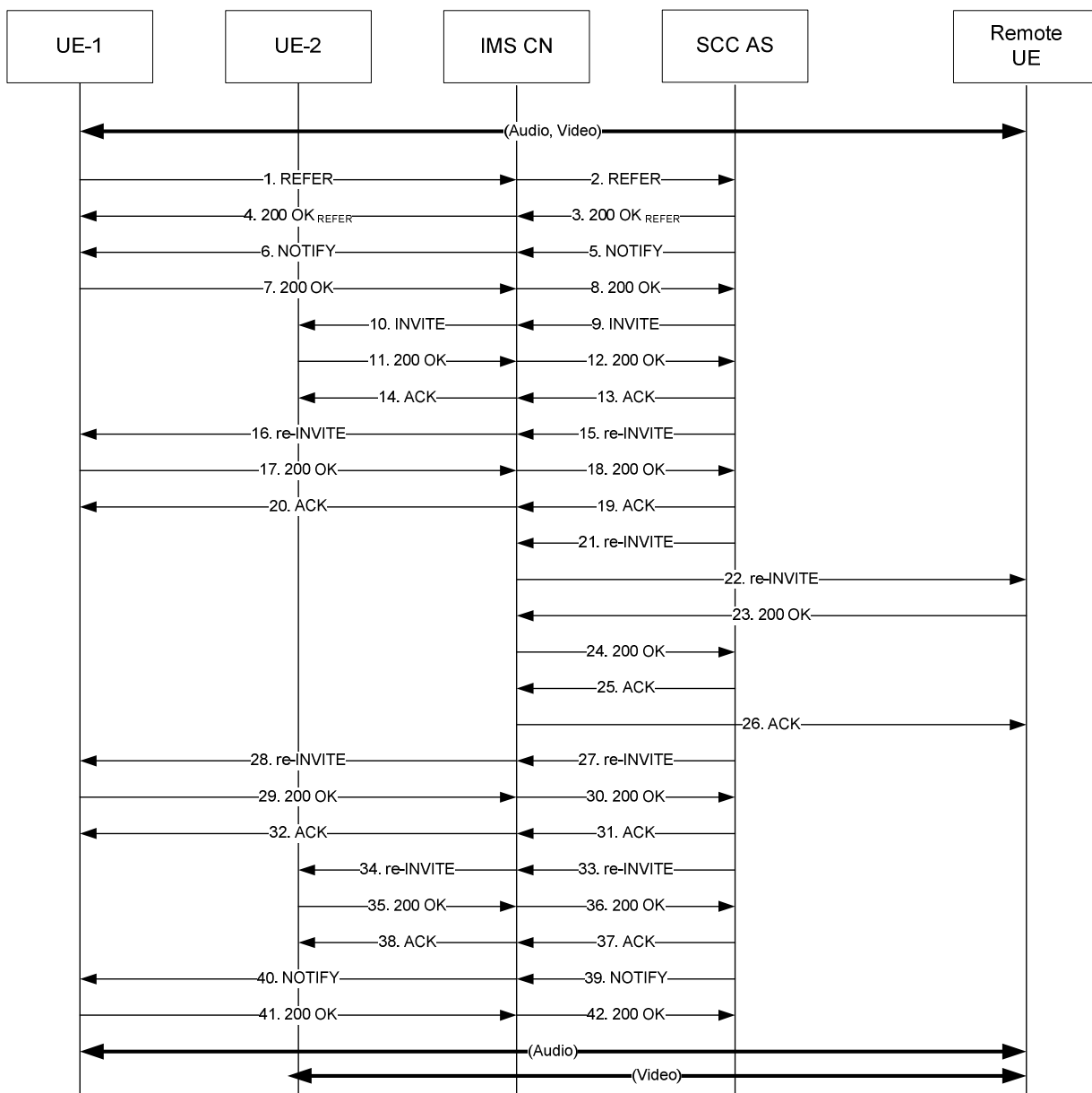
## A.4 Signalling flows for establishment of collaborative session for inter-UE transfer

### A.4.1 Introduction

This clause describes signalling flows for establishing a collaborative session. Two different scenarios have been considered:

- subclause A.4.3 shows an example where the collaborative session is established by transferring a media component from the controller UE to a controllee UE; and
- subclause A.4.3 and shows an example where the collaborative session is established by adding a new media component on a controllee UE.

### A.4.2 Collaborative session establishment with media transfer



**Figure A.4.2: Controller UE establishes a collaborative session by transferring a media from controller UE to controllee UE**

NOTE 1: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

**1-2. SIP REFER request (SIP REFER request from UE-1 to SCC-AS)**

There is an existing session with audio and video between controller UE, UE-1 (123.45.67.89), and remote UE (132.54.76.98). The video component is bidirectional from the remote UE to the controller UE, UE-1. The Controller UE attempts to transfer the video portion of this session to the controllee UE, UE-2.

**Table A.4.2-1 SIP REFER request (UE-1 to SCC-AS)**

```

REFER sip:interUEtransfer@sccas1.home1.net SIP/2.0
Via:
To: sip:interUEtransfer@sccas1.home1.net
From: sip:user1_public1@home1.net; tag=13579
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 93809824 REFER
Max-Forwards: 70
P-Preferred-Identity:
Refer-To: <sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6?body=
m%3Daudio%20%20RTP%2FAVP%97%0Dm%3Dvideo%203002%20RTP%2FAVP%2098%2099>
Require: target-dialog
Target-dialog: cb03a0s09a2sdfglkj321576;remote-tag=abcdef;local-tag=123456
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91ewxyz>;+g.3gpp.iut-controller
Referred-By: sip:user1_public1@home1.net
Accept: application/sdp, message/sipfrag
Content-Length: 0

```

**3-4. SIP 200 (OK) response (from SCC AS to UE-1)**

The SCC-AS sends a SIP 200 (OK) response to controller UE-1 as response to the SIP REFER request.

**5-6. SIP NOTIFY request (from SCC AS to UE-1)**

The SCC-AS sends a SIP NOTIFY request to controller UE-1 to notify implicit subscription to the SIP REFER request results.

**Table A.4.2-5 SIP NOTIFY request (SCC-AS to UE-1)**

```

NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz SIP/2.0
Via:
To: sip:user1_public1@home1.net;tag=24680
From: sip:interUEtransfer@sccas1.home1.net;tag=13579
Call-ID: cb03a0s09a2sdfglkj490333
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: refer
Subscription-State: active;expires=3600
Content-Type: message/sipfrag ;version=2.0
Content-Length: (...)

SIP/2.0 100 Trying

```

**7-8. SIP 200 (OK) response (from UE-1 AS to SCC-AS)**

The controller UE, UE-1, acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC-AS.

**9-10. SIP INVITE request (from SCC-AS to UE-2)**

The SCC-AS sends a SIP INVITE request to the controllee UE, UE-2, to transfer video media.

**Table A.4.2-9 SIP INVITE request (SCC-AS to UE-2)**

```

INVITE sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public2@home1.net;
From: sip:interUEtransfer@sccas1.home1.net; tag=27365
Call-ID: cb03a0s09a2sdfglkj22222
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Referred-By: sip:user1_public1@home1.net
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=sendonly

```

**11-12. SIP 200 (OK) response (from UE-2 to SCC-AS)**

The controllee UE, UE-2, acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.4.2-11 SIP 200 (OK) response (UE-2 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user1_public2@home1.net; tag = 27365
From: sip:interUEtransfer@sccas1.home1.net; tag = 36527
Call-ID: cb03a0s09a2sdfglkj22222
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
c=145.23.77.88
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=inactive

```

**13-14. SIP ACK request (from SCC-AS to UE-2)**

The SCC-AS sends a SIP ACK request to the controllee UE, UE-2.

**15-16. SIP re-INVITE request (from SCC-AS to UE-1)**

The SCC-AS sends a SIP re-INVITE request to the controller UE, UE-1.

**Table A.4.2-15 SIP INVITE request (SCC-AS to UE-1)**

```

INVITE sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz SIP/2.0
Via:
To: sip:user1_public1@home1.net;tag=11928
From: sip:user3_public3@home3.net;tag = 27364
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98 99
a=sendonly
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**17-18. SIP 200 (OK) response (from UE-1 to SCC-AS)**

The controller UE, UE-1, acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.4.2-17 SIP 200 (OK) response (UE-1 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user3_public3@home3.net;tag = 27364
From: sip:user1_public1@home1.net;tag=11928
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
c=145.23.77.88
t=0 0
m=audio 1300 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=inactive

```

**19-20. SIP ACK request (from SCC-AS to UE-1)**

The SCC-AS sends a SIP ACK request to the controller UE, UE-1, in response to the SIP 200 (OK) response.

**21-22. SIP re-INVITE request (from SCC-AS to remote UE)**

The SCC-AS sends a SIP re-INVITE request to the remote UE.

**Table A.4.2-21 SIP INVITE request (SCC-AS to remote UE)**

```

INVITE sip:user3_public3@home3.net SIP/2.0
Via:
To: sip:user3_public3@home3.net;tag = 11928
From: sip:user1_public1@home1.net; tag=27364
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
t=0 0
m=audio 1300 RTP/AVP 96 97
c=IN IP4 123.45.67.89
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
c=IN IP4 145.23.77.88
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**23-24. SIP 200 (OK) response (from remote UE to SCC-AS)**

The remote UE acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.4.2-23 SIP 200 (OK) response (remote UE to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user1_public1@home1.net; tag=27364
From: sip:user3_public3@home3.net;tag = 11928
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
P-Asserted-Identity:
Contact: sip:user3_public3@home3.net
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**25-26. SIP ACK request (from SCC-AS to remote UE)**

The SCC-AS sends a SIP ACK request to the remote UE.

**27-28. SIP re-INVITE request (from SCC-AS to UE-1)**

The SCC-AS sends a SIP re-INVITE request to the controller UE, UE-1.

**Table A.4.2-27 SIP INVITE request (SCC-AS to UE-1)**

```
INVITE sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz SIP/2.0
Via:
To: sip:user1_public1@home1.net;tag=11928
From: sip:user3_public3@home3.net;tag = 27364
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 0 RTP/AVP 98 99
```

**29-30. SIP 200 (OK) response (from UE-1 to SCC-AS)**

The controller UE, UE-1, acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.4.2-29 SIP 200 (OK) response (UE-1 to SCC-AS)**

```
SIP/2.0 200 OK
Via:
To: sip:user3_public3@home3.net;tag = 27364
From: sip:user1_public1@home1.net;tag=11928
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
c=145.23.77.88
t=0 0
m=audio 1300 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 0 RTP/AVP 98 99
```

**31-32. SIP ACK request (from SCC-AS to UE-1)**

The SCC-AS sends a SIP ACK request to the controller UE, UE-1, in response to the SIP 200 (OK) response.



**33-34. SIP re-INVITE request (from SCC-AS to UE-2)**

The SCC-AS sends a SIP re-INVITE request to UE-2 to activate the video media components.

**Table A.4.2-33 SIP INVITE request (SCC-AS to UE-2)**

```

INVITE sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public2@home1.net;
From: sip:interUEtransfer@sccas1.home1.net; tag=27365
Call-ID: cb03a0s09a2sdfglkj22222
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Referred-By: sip:user1_public1@home1.net
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=sendrecv

```

**35-36. SIP 200 (OK) response (from UE-2 to SCC-AS)**

The controllee UE, UE-2, acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.4.2-35 SIP 200 (OK) response (UE-2 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user1_public2@home1.net; tag = 27365
From: sip:interUEtransfer@sccas1.home1.net; tag = 36527
Call-ID: cb03a0s09a2sdfglkj22222
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
c=145.23.77.88
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=sendrecv

```

**37-38. SIP ACK request (from SCC-AS to UE-2)**

The SCC-AS sends a SIP ACK request to the controllee UE, UE2.

**39-40. SIP NOTIFY request (from SCC-AS to UE-1)**

The SCC-AS sends a SIP NOTIFY request to controller UE, UE-1, to inform about the success status of the inter-UE transfer.

**Table A.4.2-39 SIP NOTIFY request (SCC-AS to UE-1)**

```

NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz SIP/2.0
Via:
To: sip:user1_public1@home1.net; tag=24680
From: sip:interUEtransfer@sccas1.home1.net;tag=13579
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: refer
Subscription-State:terminated; reason=noresource
Content-Type: message/sipfrag ;version=2.0
Content-Length: (...)

SIP/2.0 200 OK
Content-Type: application/sdp

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
c=145.23.77.88
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=sendrecv

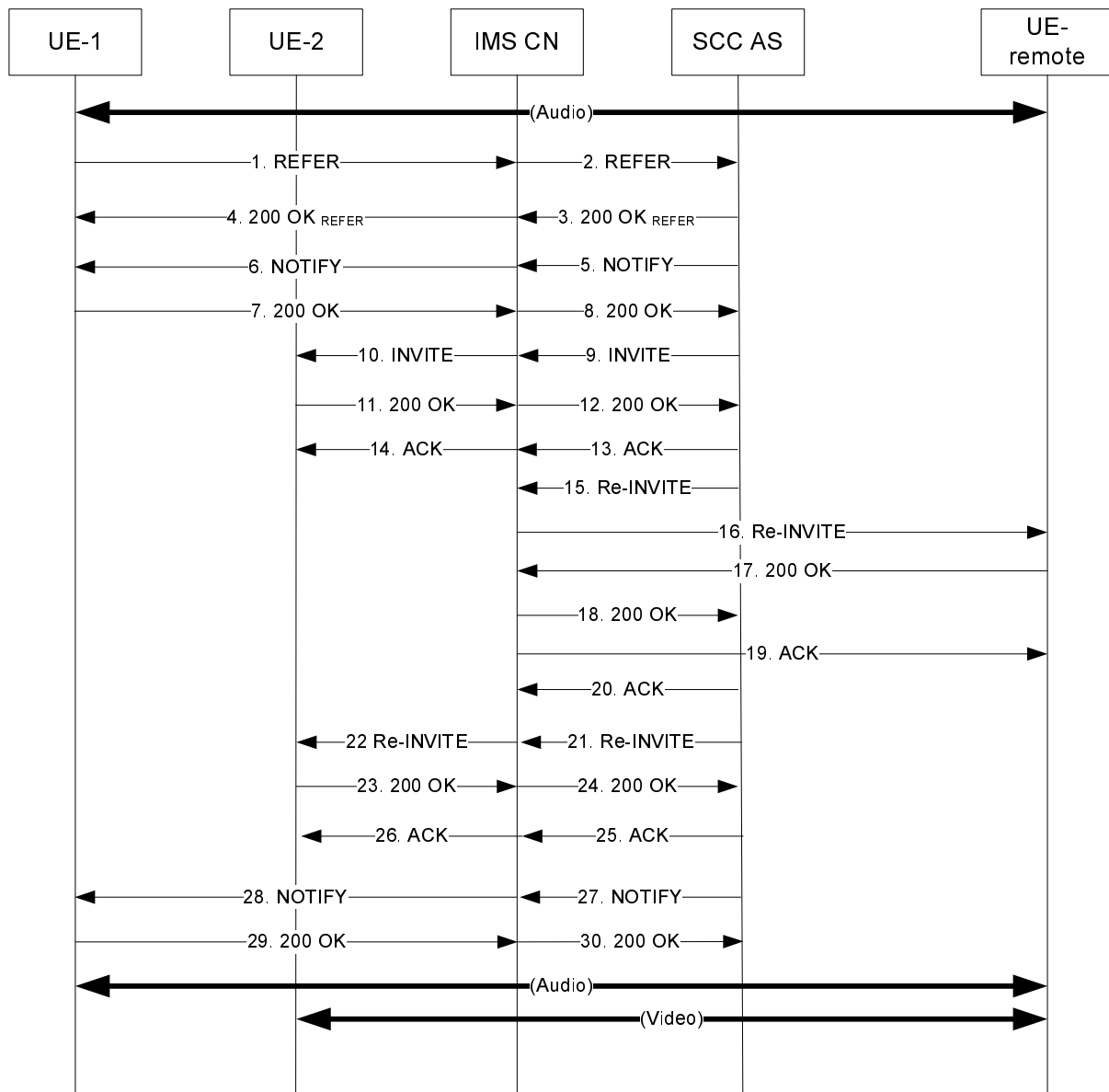
```

#### 41-42. SIP 200 (OK) response (from UE-1 to SCC-AS)

The controller UE, UE-1, acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC-AS.

### A.4.3 Collaborative session establishment with new media

There is an existing session with audio between controller UE, UE-1, and the remote UE. The controller UE establishes a collaborative session by adding a video media component to the controllee UE, UE-2.



**Figure A.4.3: Controller UE establishes a collaborative session by adding a new media on controllee UE**

NOTE: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

**1-2. SIP REFER request (from UE-1 to SCC-AS)**

The controller UE, UE-1 sends a SIP REFER request to the SCC AS containing a Refer-To header field containing the GRUU of controllee UE, UE-2 and a body parameter containing an m line for audio set to zero and an m line for video with the port number set to the discard port number "9" since the port number is unknown. The SIP REFER request also includes a Target-dialog header field containing the details of the dialog for the existing session between controller UE, UE-1 and the remote UE.

**Table A.4.3-1 SIP REFER request (UE-1 to SCC-AS)**

```

REFER sip:interUEtransfer@sccas1.home1.net SIP/2.0
Via:
To: sip:interUEtransfer@sccas1.home1.net
From: sip:user1_public1@home1.net;tag=24680
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 93809824 REFER
Max-Forwards: 70
P-Preferred-Identity: sip:user1_public1@home1.net
Refer-To: <sip:user1_public2@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-
00a0c91e6bf6?body=m%3Daudio%20%20RTP%2FAVP%2096%0Dm%3Dvideo%209%20RTP%2FAVP%2098%2099>
Require: target-dialog
Target-dialog: cb03a0s09a2sdfglkj13579; remote-tag=abcdef; local-tag=123456
Referred-By: sip:user1_public1@home1.net
Contact: <sip:user1_public1@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91ewxyz>;+g.3gpp.iut-controller
Allow:
Accept: message/sipfrag
Content-Length: 0

```

**3-4. SIP 200 (OK) response (from SCC AS to UE-1)**

The SCC-AS sends a SIP 200 (OK) response to controller UE-1 as response to the SIP REFER request.

**5-6. SIP NOTIFY request (from SCC AS to UE-1)**

The SCC-AS sends a SIP NOTIFY request to UE-1 notifying implicit subscription to the SIP REFER request.

**Table A.4.3-5 SIP NOTIFY request (SCC-AS to UE-1)**

```

NOTIFY
Via:
To: sip:user1_public1@home1.net;tag=24680
From: sip:interUEtransfer@sccas1.home1.net;tag=13579
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: refer
Subscription-State: active;expires=3600
Content-Type: message/sipfrag;version=2.0
Content-Length: (...)

SIP/2.0 100 Trying

```

**7-8. SIP 200 (OK) response (from UE-1 to SCC-AS)**

The controller UE, UE-1, acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC-AS.

**9-10. SIP INVITE request (from SCC-AS to UE-2)**

The SCC-AS sends a SIP INVITE request to the controllee UE, UE-2, adding video media and establishing a collaborative session. Since the URI parameters indicate that the port number for the video m-line is set to the discard port number "9", the SCC AS realizes that the port number of the remote UE is unknown and therefore adds an a-line to inactive in the SDP offer to prevent the controllee UE sending media to the remote UE. The SDP offer contains the audio media component on controller UE, UE-1 set to zero.

**Table A.4.3-9 SIP INVITE request (SCC-AS to UE-2)**

```

INVITE sip:user2_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
Record-Route: sip:scc-as@home1.net
To: sip:user2_public1@home1.net;
From: sip:user3_public3@home3.net;tag=acegi
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity: "remote user" sip:user3_public3@home3.net
Require:
Contact: sip:user3_public3@home3.net;gr=urn:uuid:f81d4fae-17oct-11a1-a678-0054c91eabcd
Allow:
Content-Type: application/sdp
Content-Length:(...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
t=0 0
m=audio 0 RTP/AVP 0
m=video 9 RTP/AVP 98 99
a=inactive
c=0.0.0.0
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

The value of c-line is set to a domain name within the ".invalid" DNS top-level domain in case of IPv6 as described in IETF RFC 6157 [43].

**11-12. SIP 200 (OK) response (from UE-2 to SCC-AS)**

The controllee UE, UE-2, acknowledges the SIP INVITE request by sending SIP 200 (OK) response to the SCC-AS. In the following example, the controllee UE which has controller capabilities sends g.3gpp.iut-controller media feature tag in the Contact header field to indicate the support for the controller UE procedures.

**Table A.4.3-11 SIP 200 (OK) response (UE-2 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user2_public1@home1.net;tag=xyzwv
From: sip:user3_public3@home3.net;tag=acegi
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6;+g.3gpp.iut-controller
Allow: INVITE, PRACK, UPDATE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
t=0 0
m=audio 0 RTP/AVP 0
m=video 9 RTP/AVP 98
a=inactive
c=145.23.77.88
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0

```

**13-14. SIP ACK request (from SCC-AS to controllee UE)**

The SCC-AS sends a SIP ACK request to the remote UE.

**15-16. SIP re-INVITE request (from SCC-AS to remote UE)**

The SCC-AS sends a SIP re-INVITE request to the remote UE.

**Table A.4.3-15 SIP re-INVITE request (SCC-AS to remote UE)**

```

INVITE sip:user3_public3@home3.net;gr=urn:uuid:f81d4fae-17oct-11a1-a678-0054c91eabcd SIP/2.0
Via:
To: sip:user3_public3@home3.net;tag=66666
From: sip:user1_public1@home1.net;tag=33333
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
t=0 0
m=audio 1300 RTP/AVP 96 97
c=IN IP4 123.45.67.89
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98
c=IN IP4 145.23.77.88
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0

```

**17-18. SIP 200 (OK) response (from remote UE to SCC-AS)**

The remote UE acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.4.3-17 SIP 200 (OK) response (remote UE to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Asserted-Identity:
Contact: sip:user3_public3@home3.net;gr=urn:uuid:f81d4fae-17oct-11a1-a678-0054c91eabcd
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
c=IN IP4 123.112.67.87
t=0 0
m=audio 3000 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0

```

**19-20. SIP ACK request (from SCC-AS to remote UE)**

The SCC-AS sends a SIP ACK request to the remote UE.

### 21-22. SIP re-INVITE request (from SCC-AS to UE-2)

The SCC-AS sends a SIP re-INVITE request to the controllee UE, UE-2 to inform the controllee UE about the port number for the video media component of the remote UE. The SCC AS adds an a-line set to active in the SDP offer. The SIP INVITE request contains a Referred-By header field containing the identity of UE-1 from the Referred-By header field from the SIP REFER request.

NOTE 1: This SIP re-INVITE request is triggered by the SIP REFER request in steps 1-2. The previous SIP INVITE request was generated by the SCC AS due to third party call control to allow sending this SIP re-INVITE request.

NOTE 2: Any other changes such as the IP address of the remote UE in case the remote UE uses different IP addresses for different media would also be updated in the SIP re-INVITE request.

**Table A.4.3-21 SIP re-INVITE request (SCC-AS to UE-2)**

```
INVITE sip:user1_public2@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To:
From:
Call-ID:
CSeq:
Contact: sip:user3_public3@home3.net;gr=urn:uuid:f81d4fae-17oct-11a1-a678-0054c91eabcd
Referred-By: sip:user1_public1@home1.net
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.87
s=-
c=IN IP4 123.45.67.87
t=0 0
m=audio 0 RTP/AVP 96 97
m=video 3002 RTP/AVP 98
b=AS:75
a=active
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
```

### 23-24. SIP 200 (OK) response (from controllee UE to SCC-AS)

**Table A.4.3-23 SIP 200 (OK) response (UE-2 to SCC-AS)**

```
SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
Contact: sip:user1_public2@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
t=0 0
m=audio 0 RTP/AVP 0
m=video 1302 RTP/AVP 98
c=145.23.77.88
b=AS:75
a=active
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
```

### 25-26. SIP ACK request (from SCC-AS to controllee UE)

The SCC-AS sends a SIP ACK request to the controllee UE to acknowledge.

### 27-28. SIP NOTIFY request (from SCC-AS to controller UE, UE-1)

When the media component is added to the controllee UE, UE-2, the SCC-AS sends a SIP NOTIFY request to the controller UE, UE-1 to inform about the success status of adding the media to the controllee UE, UE-2.

**Table A.4.3-27 SIP NOTIFY request (SCC-AS to UE-1)**

```
NOTIFY
Via:
To: sip:user1_public1@home1.net;tag = 13579
From: sip:scc-as@home1.net;tag=24680
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: refer
Subscription-State:terminated; reason=noresource
Content-Type: message/sipfrag ;version=2.0
Content-Length: (...)

SIP/2.0 200 OK
Content-Type: application/sdp
m=audio 0 RTP/AVP 0
m=video 1302 RTP/AVP 98 99
c=145.23.77.88
b=AS:75
a=active
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
```

### 29-30. SIP 200 (OK) response (from controller UE to SCC-AS)

The controller UE acknowledges the NOTIFY request by sending a SIP 200 (OK) response to the SCC-AS.

---

## A.5 Signalling flows for media transfer within collaborative session for inter-UE transfer

### A.5.1 Introduction

This subclause describes signalling flows for media transfer within collaborative sessions. Two different scenarios are considered in the clause:

- subclause A.5.2 shows an example where a media component is transferred from the controller UE to the controllee UE; and
- subclause A.5.3 shows an example where a media component is transferred from one controllee UE to another controllee UE.



## A.5.2 Controller UE initiated media transfer from controller UE to controllee UE

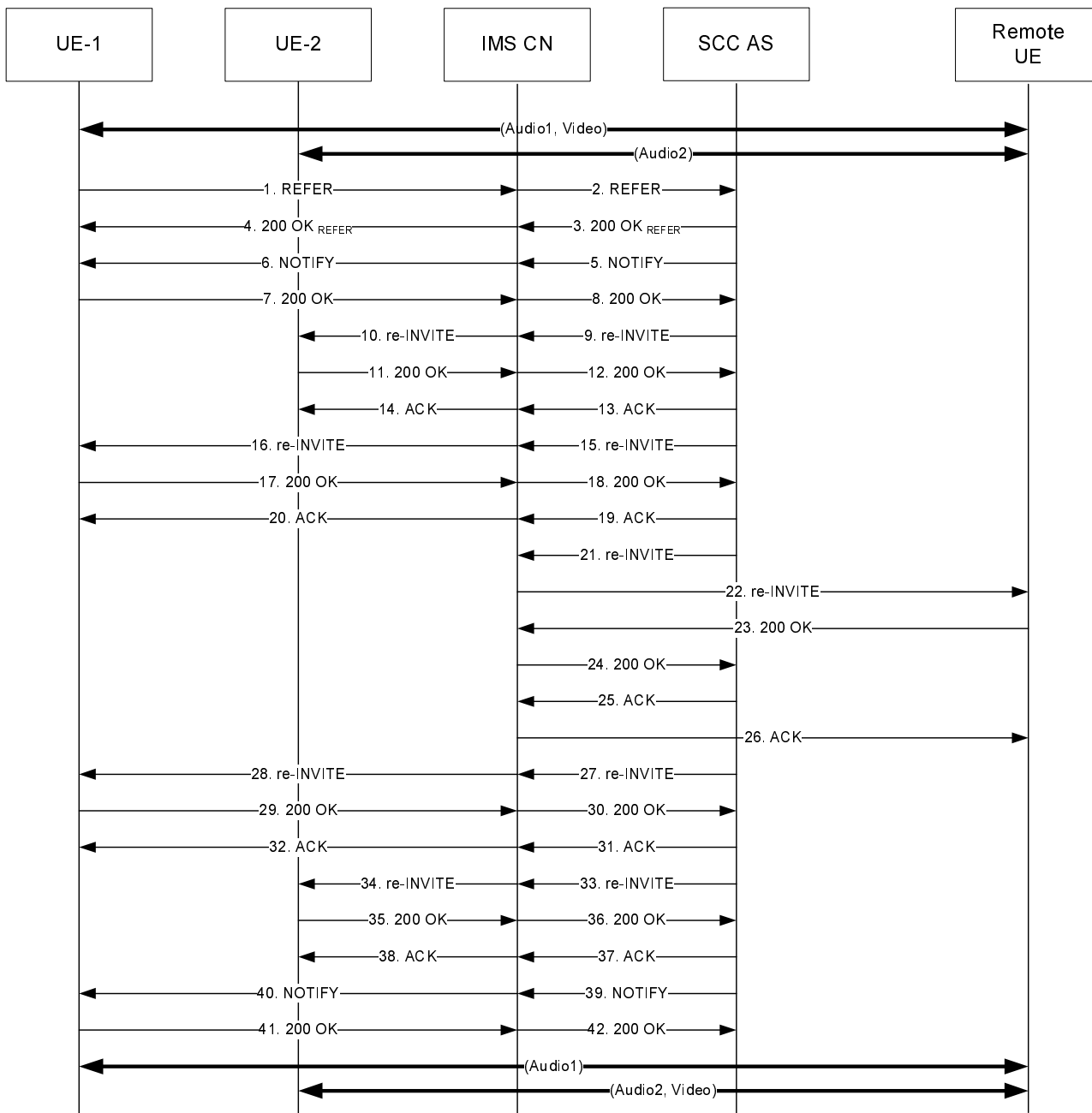


Figure A.5.2: Controller UE transfers a media on controllee UE

NOTE 1: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

### 1-2. SIP REFER request (SIP REFER request from UE-1 to SCC-AS)

There is an existing session with audio1 and video between the controller UE, UE-1 (123.45.67.89), and the remote UE (132.54.76.98). There is another audio2 component between the controllee UE, UE-2 (145.23.77.88), and the remote UE. The video component is bidirectional from the remote UE to the controller UE, UE-1. The Controller UE attempts to transfer the video portion of this session to the controllee UE, UE-2.

**Table A.5.2-1 SIP REFER request (UE-1 to SCC-AS)**

```

REFER sip:interUEtransfer@sccas1.homel.net SIP/2.0
Via:
To: sip:interUEtransfer@sccas1.homel.net
From: sip:user1_public1@homel.net; tag=13579
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 93809824 REFER
Max-Forwards: 70
P-Preferred-Identity:
Refer-To: <sip:user1_public2@homel.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6?body=
m%3Daudio%20%20RTP%2FAVP%2097%0Dm%3Daudio%203004%20RTP%2FAVP%2097%0Dm%3Dvideo%203002%20RTP
%2FAVP%2098%2099>
Require: target-dialog
Target-dialog: cb03a0s09a2sdfglkj321576;remote-tag=abcdef;local-tag=123456
Contact: <sip:user1_public1@homel.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91ewxyz>;+g.3gpp.iut-controller
Referred-By: sip:user1_public1@homel.net
Accept: application/sdp, message/sipfrag
Content-Length: 0

```

**3-4. SIP 200 (OK) response (from SCC AS to UE-1)**

The SCC-AS sends a SIP 200 (OK) response to the controller UE-1 as response to the SIP REFER request.

**5-6. SIP NOTIFY request (from SCC AS to UE-1)**

The SCC-AS sends a SIP NOTIFY request to UE-1 to notify implicit subscription to the SIP REFER request results.

**Table A.5.2-5 SIP NOTIFY request (SCC-AS to UE-1)**

```

NOTIFY sip:user1_public1@homel.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz SIP/2.0
Via:
To: sip:user1_public1@homel.net;tag=24680
From: sip:interUEtransfer@sccas1.homel.net;tag=13579
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@homel.net
Allow:
Event: refer
Subscription-State: active;expires=3600
Content-Type: message/sipfrag ;version=2.0
Content-Length: (...)

SIP/2.0 100 Trying

```

**7-8. SIP 200 (OK) response (from UE-1 AS to SCC-AS)**

The controller UE, UE-1, acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC-AS.

**9-10. SIP re-INVITE request (from SCC-AS to UE-2)**

The SCC-AS sends a SIP re-INVITE request to the controllee UE, UE-2, to transfer video media. In order to avoid UE-2 to start sending video to the remote UE, the SCC-AS adds an a-line set to sendonly and b-lines to set the bandwidth to 0 in the SDP offer.

**Table A.5.2-9 SIP INVITE request (SCC-AS to UE-2)**

```

INVITE sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public2@home1.net;
From: sip:interUEtransfer@sccas1.home1.net; tag=12486
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Referred-By: sip:user1_public1@home1.net
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=audio 3004 RTP/AVP 96 97
a=rtpmap :0 PCMU/8000
b=RR :0
b=RS :0
m=video 3002 RTP/AVP 98 99
a=sendonly
b=RR:0
b=RS:0
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**11-12. SIP 200 (OK) response (from UE-2 to SCC-AS)**

The controller UE, UE-2, acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.5.2-11 SIP 200 OK response (UE-2 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user1_public2@home1.net; tag = xyzwv
From: sip:interUEtransfer@sccas1.home1.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
c=145.23.77.88
t=0 0
m=audio 0 RTP/AVP 97
m=audio 1304 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
m=video 1302 RTP/AVP 98 99
a=recvonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**13-14. SIP ACK request (from SCC-AS to UE-2)**

The SCC-AS sends a SIP ACK request to the controller UE, UE-2.

**15-16. SIP re-INVITE request (from SCC-AS to UE-1)**

The SCC-AS sends a SIP re-INVITE request to the controller UE, UE-1.

**Table A.5.2-15 SIP INVITE request (SCC-AS to UE-1)**

```
INVITE sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz SIP/2.0
Via:
To: sip:user1_public1@home1.net;tag=11928
From: sip:user3_public3@home3.net;tag = 27364
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 96 97
m=audio 3000 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98 99
a=sendonly
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

**17-18. SIP 200 (OK) response (from UE-1 to SCC-AS)**

The controller UE, UE-1, acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.5.2-17 SIP 200 (OK) response (UE-1 to SCC-AS)**

```
SIP/2.0 200 OK
Via:
To: sip:user3_public3@home3.net;tag = 27364
From: sip:user1_public1@home1.net;tag=11928
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
c=145.23.77.88
t=0 0
m=audio 0 RTP/AVP 96 97
m=audio 1300 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=recvonly
```

**19-20. SIP ACK request (from SCC-AS to UE-1)**

The SCC-AS sends a SIP ACK request to the controller UE, UE-1, in response to the SIP 200 (OK) response.

**21-22. SIP re-INVITE request (from SCC-AS to remote UE)**

The SCC-AS sends a SIP re-INVITE request to the remote UE.

**Table A.5.2-21 SIP INVITE request (SCC-AS to remote UE)**

```
INVITE sip:user3_public3@home3.net SIP/2.0
Via:
To: sip:user3_public3@home3.net;tag = 66666
From: sip:user1_public1@home1.net; tag=33333
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
t=0 0
m=audio 1300 RTP/AVP 96 97
c=IN IP4 123.45.67.89
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=audio 1304 RTP/AVP 96 97
c=IN IP4 145.23.77.88
b=AS:25.4
a=rtpmap:94 AMR
a=fmtp:94 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:95 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
c=IN IP4 145.23.77.88
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

**23-24. SIP 200 (OK) response (from remote UE to SCC-AS)**

The remote UE acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.5.2-23 SIP 200 (OK) response (remote UE to SCC-AS)**

```
SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Asserted-Identity:
Contact: sip:user3_public3@home3.net
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=audio 3004 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:94 AMR
a=fmtp:94 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:95 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

**25-26. SIP ACK request (from SCC-AS to remote UE)**

The SCC-AS sends a SIP ACK request to the remote UE.

**27-28. SIP re-INVITE request (from SCC-AS to UE-1)**

The SCC-AS sends a SIP re-INVITE request to the controller UE, UE-1.

**Table A.5.2-27 SIP INVITE request (SCC-AS to UE-1)**

```
INVITE sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz SIP/2.0
Via:
To:
From:
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=audio 0 RTP/AVP 96 97
m=video 0 RTP/AVP 98 99
```

**29-30. SIP 200 (OK) response (from UE-1 to SCC-AS)**

The controller UE, UE-1, acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**31-32. SIP ACK request (from SCC-AS to UE-1)**

The SCC-AS sends a SIP ACK request to the controller UE, UE-1, in response to the SIP 200 (OK) response.

**33-34. SIP re-INVITE request (from SCC-AS to UE-2)**

The SCC-AS sends a SIP re-INVITE request to the controllee UE, UE-2, to activate the video media components.



**Table A.5.2-33 SIP INVITE request (SCC-AS to UE-2)**

```

INVITE sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public2@home1.net;
From: sip:interUETransfer@sccas1.home1.net; tag=27365
Call-ID: cb03a0s09a2sdfglkj22222
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Referred-By: sip:user1_public1@home1.net
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=audio 3004 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:94 AMR
a=fmtp:94 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:95 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=sendrecv

```

**35-36. SIP 200 (OK) response (from UE-2 to SCC-AS)**

The controller UE, UE-2, acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.5.2-35 SIP 200 (OK) response (UE-2 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user1_public2@home1.net; tag = 27365
From: sip:interUETransfer@sccas1.home1.net; tag = 36527
Call-ID: cb03a0s09a2sdfglkj22222
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
c=145.23.77.88
t=0 0
m=audio 0 RTP/AVP 97
m=audio 1304 RTP/AVP 96 97
c=IN IP4 145.23.77.88
b=AS:25.4
a=rtpmap:94 AMR
a=fmtp:94 profile-level-id=0
a=rtpmap:95 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**37-38. SIP ACK request (from SCC-AS to UE-2)**

The SCC-AS sends a SIP ACK request to the controllee UE, UE-2, in response to the SIP 200 (OK) response.

**39-40. SIP NOTIFY request (from SCC-AS to controller UE, UE-1)**

The SCC-AS sends a SIP NOTIFY request to the controller UE, UE-1, to inform about the success status of the inter-UE transfer.

**Table A.5.2-39 SIP NOTIFY request (SCC-AS to UE-1)**

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz SIP/2.0
Via:
To: sip:user1_public1@home1.net; tag=24680
From: sip:interUEtransfer@sccas1.home1.net;tag=13579
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: refer
Subscription-State:terminated; reason=noresource
Content-Type: message/sipfrag ;version=2.0
Content-Length: (...)

SIP/2.0 200 OK
Content-Type: application/sdp

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
c=145.23.77.88
t=0 0
m=audio 0 RTP/AVP 97
m=audio 1304 RTP/AVP 96 97
c=IN IP4 145.23.77.88
b=AS:25.4
a=rtpmap:94 AMR
a=fmtp:94 profile-level-id=0
a=rtpmap:95 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

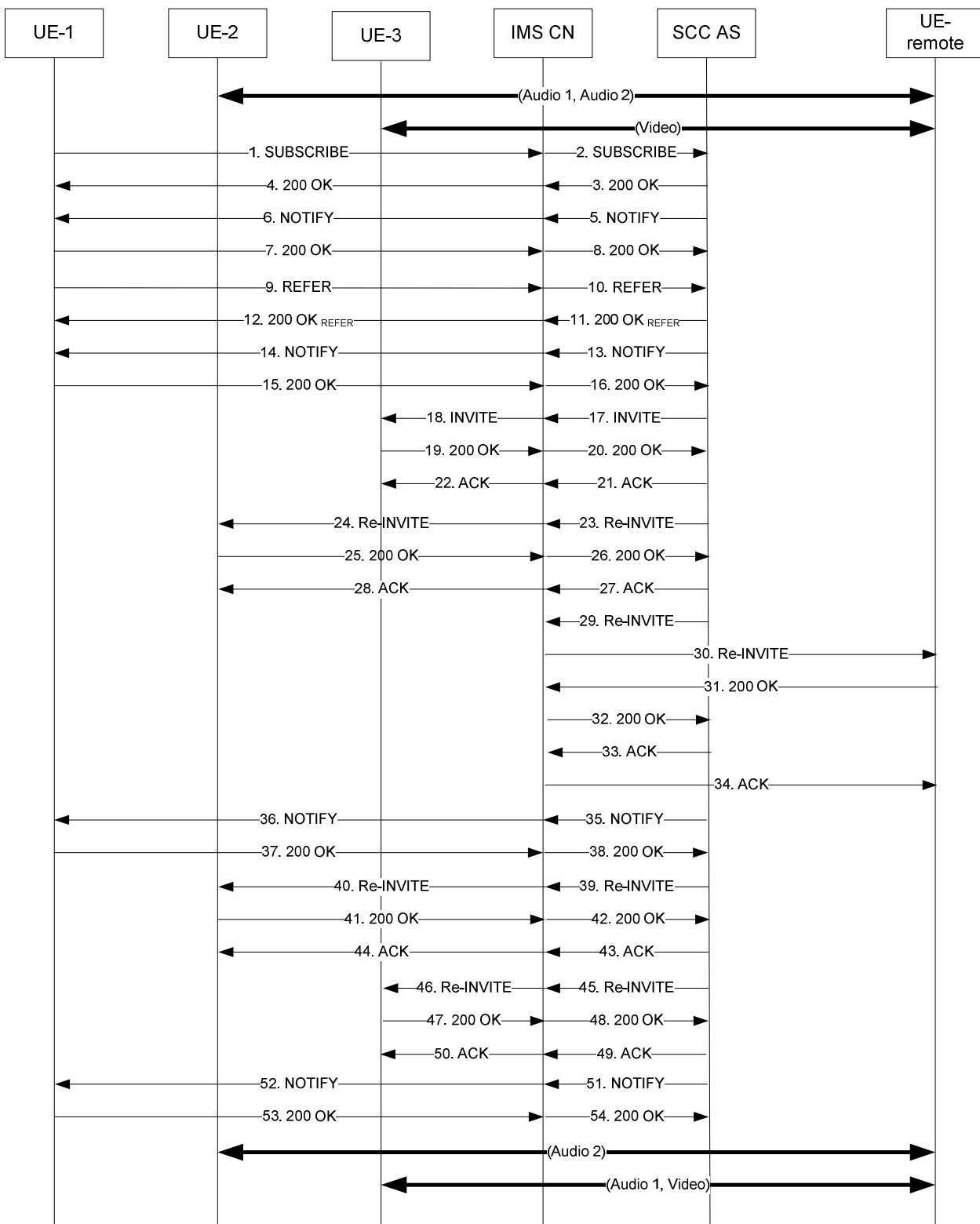
**41-42. SIP 200 (OK) response (from – UE-1 to SCC-AS)**

The controller UE, UE-1, acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC-AS.

## A.5.3 Controller UE initiated media transfer from controllee UE to another controllee UE with subscription to dialog events

The signalling flow in figure A.5.3 describes the procedures for media transfer from one controllee UE to another controllee UE with persistent subscription to dialog events.

NOTE 1: For brevity not all SIP NOTIFY requests sent as a result of the subscription to the dialog event package are shown.



**Figure A.5.3: Controller UE transfers a media from one controllee UE to another controllee UE**

**1-2. SIP SUBSCRIBE request (from controller UE to SCC-AS) - see example in table A.5.3-1**

In order that the controller UE fetches the information about the session descriptions of the UEs within the collaborative session, the controller UE subscribes to the existing dialog between the controller UE and the SCC AS.

**Table A.5.3-1 SIP SUBSCRIBE request (controller UE to SCC-AS)**

```
SUBSCRIBE sip:scc-as@home1.net SIP/2.0
Via:
To: sip:scc-as@home1.net; tag= 24680
From: sip:user1_public1@home1.net; tag=13579
Event: dialog; call-id=" cb03a0s09a2sdfglkj321576"; from-tag="54321"; to-tag="123456";
    include-session-description
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 1 SUBSCRIBE
Max-Forwards: 70
P-Preferred-Identity:
Require: target-dialog
Expires: 3600
Target-dialog: cb03a0s09a2sdfglkj321576;remote-tag=abcdef;local-tag=123456
Contact: sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz
CSeq:
Allow:
Accept: application/dialog-info+xml
Content-Length: 0
```

**3-4. SIP 200 (OK) response (from SCC-AS to controller UE)**

The SCC AS acknowledges the SIP SUBSCRIBE request by sending a SIP 200 (OK) response to the controller UE.

**5-6. SIP NOTIFY request (from SCC-AS to controller UE) - see example in table A.5.3-5**

The SCC AS sends a SIP NOTIFY request containing SDP for the remote UE so that the controller UE has the current state of the media for the collaborative session.

Table A.5.3-5 SIP NOTIFY request (SCC-AS to controller UE)

```

NOTIFY sip:user1_public1@home1.net SIP/2.0
Via:
To: sip:user1_public1@home1.net; tag=13579
From: sip:scc-as@home1.net; tag= 24680
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: dialog
Content-Type: application/dialog-info+xml
Content-Length: (...)

<?xml version="1.0"?>
<dialog-info xmlns="urn:ietf:params:xml:ns:dialog-info"
  version="0"
  state="full"
  entity="sip:scc-as@home1.net">
  <dialog id="xxxx" call-id="ffafa" local-tag="dd" remote-tag="ee">
  <state>confirmed</state>
  <local>
  <identity display="controllee UE">sip:user2_public1@home1.net</identity>
  <target>sip:user2_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6</target>
  <session-description type="application/sdp">
v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
t=0 0
m=audio 49174 RTP/AVP 96 97
c=IN IP4 123.45.67.89
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=audio 44552 RTP/AVP 96 97
c=IN IP4 123.45.67.89
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1009 RTP/AVP 98 99
c=IN IP4 123.112.67.87
a=sendonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
  </session-description>
  </local>
  <remote>
  <identity display="remote UE">tel:+1-237-555-2222</identity>
  <target>sip:user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-ad76cc7fc74</target>
  <session-description type="application/sdp">
v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
t=0 0
m=audio 49174 RTP/AVP 96 97
c= IN IP4 132.54.76.98
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=audio 44552 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
c= IN IP4 132.54.76.98

```

```

m=video 1009 RTP/AVP 98 99
c= IN IP4 132.54.76.98
a=sendonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
</session-description>
</remote>
</dialog>
</dialog-info>

```

#### 7-8. SIP 200 (OK) response (from controller UE-1 to SCC-AS)

The controller UE-1 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS.

#### 9-10. SIP REFER request (from controller UE-1 to SCC-AS) - see example in table A.5.3-9

There is an existing session with audio 1 and audio 2 between UE-2 (123.45.67.89) and the remote UE (132.54.76.98). The video component is unidirectional from the remote UE to the controllee UE, UE-3 (123.112.67.87). The controller UE-1 attempts to transfer the audio 1 portion of this session to the controllee UE, UE-3.

**Table A.5.3-9 SIP REFER request (UE-1 to SCC-AS)**

```

REFER sip:scc-as@home1.net SIP/2.0
Via:
To: sip:scc-as@home1.net; tag= 24680
From: sip:user1_public1@home1.net; tag=13579
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 93809824 REFER
Max-Forwards: 70
P-Preferred-Identity: sip:user1_public1@home1.net
Refer-To: <sip:user1_public3@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91e6bf6body=m%3DAudio%20%20RTP%2FAVP%20%0Dm%3DAudio%20
49174%20RTP%2FAVP%2096%0Dm%3Dvideo%201009%20RTP%2FAVP%2098%2099>
Require: target-dialog
Target-dialog: cb03a0s09a2sdfglkj321576;remote-tag=abcdef;local-tag=123456
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91ewxyz>;+g.3gpp.iut-controller
Referred-By: sip:user1_public1@home1.net
Accept: message/sipfrag
Content-Length: 0

```

#### 11-12. SIP 200 (OK) response (from SCC AS to UE-1)

The SCC-AS sends a SIP 200 (OK) response to controller UE-1 as response to the SIP REFER request.

#### 13-14. SIP NOTIFY request (from SCC AS to UE-1) - see example in table A.6.3-13

The SCC-AS sends a SIP NOTIFY request to UE-1 to notify implicit subscription to the SIP REFER request results.

**Table A.5.3-13 SIP NOTIFY request (SCC-AS to UE-1)**

```

NOTIFY
Via:
To: sip:user1_public1@home1.net;tag=24680
From: sip:scc-as@home1.net;tag=13579
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: refer
Subscription-State: active;expires=3600
Content-Type: message/sipfrag;version=2.0
Content-Length: (...)

SIP/2.0 100 Trying

```

**15-16. SIP 200 (OK) response (from UE-1 AS to SCC-AS)**

The controller UE, UE-1, acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC-AS.

**17-18. SIP INVITE request (from SCC-AS to UE-3) - see example in table A.5.3-17**

Since the message 9-10 contains a Refer-to header field addressed to UE-3 and the URI parameters, listing an audio line which is not currently supported by another controllee UE than UE-2, the SCC AS realizes the procedure is for transferring the media from that controllee UE (UE-2) to controllee UE (UE-3). The SCC-AS sends a SIP INVITE request to the controllee UE, UE-3, to transfer the audio media component. The SDP in the SIP INVITE request lists the media lines within the collaborative session. In order to avoid UE-3 to start sending audio to the remote UE, the SCC-AS adds an a-line set to sendonly in the SDP offer.

**Table A.5.3-17 SIP INVITE request (SCC-AS to UE-3)**

```

INVITE sip:user1_public3@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public3@home1.net;
From: sip:scc-as@home1.net; tag=12486
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 49174 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
a= sendonly
b=RR:0
b=RS:0m=audio 0 RTP/AVP 0
m=video 1009 RTP/AVP 98 99
a=sendonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**19-20. SIP 200 (OK) response (from UE-3 to SCC-AS) - see example in table A.5.3-19**

The controllee UE, UE-3, acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.5.3-19 SIP 200 (OK) response (UE-3 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user1_public3@home1.net; tag = xyzwv
From: sip:scc-as@home1.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public3@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
c=123.112.67.87
t=0 0
m=audio 3002 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
a=recvonly
m=audio 0 RTP/AVP 0
m=video 1302 RTP/AVP 98 99
a=recvonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**21-22. SIP ACK request (from SCC-AS to UE-3)**

The SCC-AS sends a SIP ACK request to UE-3 to acknowledge.

**23-24. SIP re-INVITE request (from SCC-AS to controllee UE, UE-2) - see example in table A.5.3-23**

The SCC AS sends a SIP re-INVITE request to controllee UE, UE-2 to put Audio 1 on hold.

**Table A.5.3-23 SIP INVITE request (SCC-AS to UE-2)**

```

INVITE sip:user1_public2@home3.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public2@home1.net;
From: sip:scc-as@home1.net; tag=12386
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
c=IN IP4 123.112.67.87
t=0 0
m=audio 49174 RTP/AVP 96 97
a=sendonly
b=RR:0
b=RS:0
m=audio 44552 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
a=sendonly
b=RR:0

```

**25-26. SIP 200 (OK) response (from UE-2 to SCC-AS) - see example in table A.5.3-25**

The controllee UE, UE-2, acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCC-AS.



**Table A.5.3-25 SIP 200 (OK) response (UE-2 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user1_public2@home1.net; tag = xyzwv
From: sip:scc-as@home1.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=IN IP4 123.45.67.89
t=0 0
m=audio 32324 RTP/AVP 96 97
a=recvonly
m=audio 34002 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
a=recvonly

```

**27-28. SIP ACK request (from SCC-AS to UE-2)**

The SCC-AS sends a SIP ACK request to UE-2 to acknowledge.

**29-30 SIP re-INVITE request (from SCC-AS to remote UE) - see example in table A.5.3-29**

The SCC-AS sends a SIP re-INVITE request to the remote UE.

**Table A.5.3-29 SIP INVITE request (SCC-AS to remote UE)**

```

INVITE sip:user2_public1@home3.net;SIP/2.0
Via:
To: sip:user2_public1@home2.net;tag=66666
From: sip:scc-as@home1.net; tag=33333
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact:sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
t=0 0
m=audio 3002 RTP/AVP 96 97
c= IN IP4 123.112.67.87
a=rtpmap:0 PCMU/8000
m=audio 34002 RTP/AVP 96 97
C=IN IP4 123.45.67.89
A=rtpmap:0 PCMU/8000
m=video 1302 RTP/AVP 98 99
c= IN IP4 123.112.67.87
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=recvonly

```

**31-32. SIP 200 (OK) response (from remote UE to SCC-AS) - see example in table A.5.3-31**

The remote UE acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.5.3-31 SIP 200 (OK) response (remote UE to SCC-AS)**

```
SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Asserted-Identity:
Contact: sip:user2_public1@home2.net;
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c= IN IP4 132.54.76.98
t=0 0
m=audio 49174 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=audio 44552 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
m=video 1009 RTP/AVP 98 99
a=sendonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=sendonly
```

**33-34. SIP ACK request (from SCC-AS to remote UE)**

The SCC-AS sends a SIP ACK request to the remote UE.

**35-36. SIP NOTIFY request (from SCC-AS to controller UE) - see example in table A.5.3-35**

The SCC AS sends a SIP NOTIFY request containing SDP for the remote UE so that the controller UE can be aware about the change of state of the media for the collaborative session.

Table A.5.3-35 SIP NOTIFY request (SCC-AS to controller UE)

```

NOTIFY sip:user1_public1@home1.net;
Via:
To: sip:user1_public1@home1.net; tag=13579
From: sip:scc-as@home1.net; tag= 24680
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: dialog
Content-Type: application/dialog-info+xml
Content-Length: (...)

<?xml version="1.0"?>
<dialog-info xmlns="urn:ietf:params:xml:ns:dialog-info"
  version="1"
  state="full"
  entity="sip:scc-as@home1.net">
  <dialog id="xxxx" call-id="ffafa" local-tag="dd" remote-tag="ee">
  <state>confirmed</state>
  <local>
  <identity display="controllee UE">sip:user2_public1@home1.net</identity>
  <target>sip:user2_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6</target>
  <session-description type="application/sdp">
v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
t=0 0
m=audio 49174 RTP/AVP 96 97
c=IN IP4 123.45.67.89
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=audio 44552 RTP/AVP 96 97
c=IN IP4 123.45.67.89
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1009 RTP/AVP 98 99
c=IN IP4 123.112.67.87
a=sendonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
  </session-description>
  </local>
  <remote>
  <identity display="remote UE">tel:+1-237-555-2222</identity>
  <target>sip:user2_public1@home2.net;gr=urn:uuid:2ad8950e-48a5-4a74-8d99-ad76cc7fc74</target>
  <session-description type="application/sdp">
v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
t=0 0
c= IN IP4 132.54.76.98
m=audio 49174 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=audio 44552 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1009 RTP/AVP 98 99

```

```

a=sendonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
</session-description>
</remote>
</dialog>
</dialog-info>

```

### 37-38. SIP 200 (OK) response (from controller UE-1 to SCC-AS)

The controller UE-1 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS.

### 39-40. SIP re-INVITE request (from SCC-AS to controllee UE, UE-2) - see example in table A.5.3-39

The SCC-AS sends a SIP re-INVITE request to UE-2 to remove the audio 1 media component.

**Table A.5.3-39 SIP INVITE request (SCC-AS to UE-2)**

```

INVITE sip:user1_public2@home3.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public2@home1.net;
From: sip:scc-as@home1.net; tag=12386
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
c=IN IP4 123.112.67.87
t=0 0
m=audio 0 RTP/AVP 0
m=audio 44552 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000

```

### 41-42. SIP 200 (OK) response (from UE-2 to SCC-AS) - see example in table A.5.3-41

The controllee UE, UE-2, acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.5.3-41 SIP 200 (OK) response (UE-2 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user1_public2@home1.net; tag = xyzwv
From: sip:scc-as@home1.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=IN IP4 123.45.67.89
t=0 0
m=audio 0 RTP/AVP 0
m=audio 34002 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000

```

**43-44. SIP ACK request (from SCC-AS to UE-2)**

The SCC -AS sends a SIP ACK request to UE-2 to acknowledge.

**45-46. SIP re\_INVITE request (from SCC-AS to controllee UE; UE-3) - see example in table A.5.3-45**

The SCC-AS sends a SIP re\_INVITE request to UE-3 to activate the audio 1 media component.

**Table A.5.3-45 SIP re-INVITE request (SCC-AS to UE-3)**

```

INVITE sip:user1_public3@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public3@home1.net;
From: sip:scc-as@home1.net; tag=12486
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Referred-By: sip:user1_public1@home1.net
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
c=IN IP4 123.112.67.87
t=0 0
m=audio 49174 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
a= sendrecv
m=audio 0 RTP/AVP 0
m=video 1009 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=sendonly

```

NOTE 2: This SIP re-INVITE request is triggered by the SIP REFER request. The previous SIP INVITE request was generated by the SCC AS due to third party call control to allow sending this SIP re-INVITE request.

**47-48. SIP 200 (OK) response (from controllee UE; UE-3 to SCC AS)**

Controllee UE, UE-3 sends a SIP 200 (OK) response to the SCC AS.

**49-50. SIP ACK request (from SCC-AS to UE-3)**

The SCC-AS sends a SIP ACK request to the controllee UE, UE-3.

#### 51-52. SIP NOTIFY request (from SCC-AS to controller UE) - see example in table A.5.3-51

The SCC AS sends a SIP NOTIFY request containing SDP of the SIP 200 (OK) response received from the controllee UE, UE-3.

**Table A.5.3-51 SIP NOTIFY request (SCC-AS to controller UE)**

```
NOTIFY sip:user1_public1@home1.net;
Via:
To: sip:user1_public1@home1.net; tag=13579
From: sip:scc-as@home1.net; tag= 24680
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: refer
Content-Type: message/sipfrag ;version=2.0 ;
Content-Length: (...)

SIP/2.0 200 OK
To: sip:user1_public3@home1.net; tag = xyzwv
From: sip:scc-as@home1.net; tag = 12486
Call-ID:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
c=123.112.67.87
t=0 0
m=audio 3002 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
m=audio 0 RTP/AVP 0
m=video 1302 RTP/AVP 98 99
a=recvonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

#### 53-54. SIP 200 (OK) response (from controller UE to SCC-AS)

The controller UE acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS.

## A.5.4 Controller UE initiated media transfer from controllee UE to another controllee UE

The signalling flow in figure A.5.4 describes the procedures for media transfer from one controllee UE to another controllee UE.

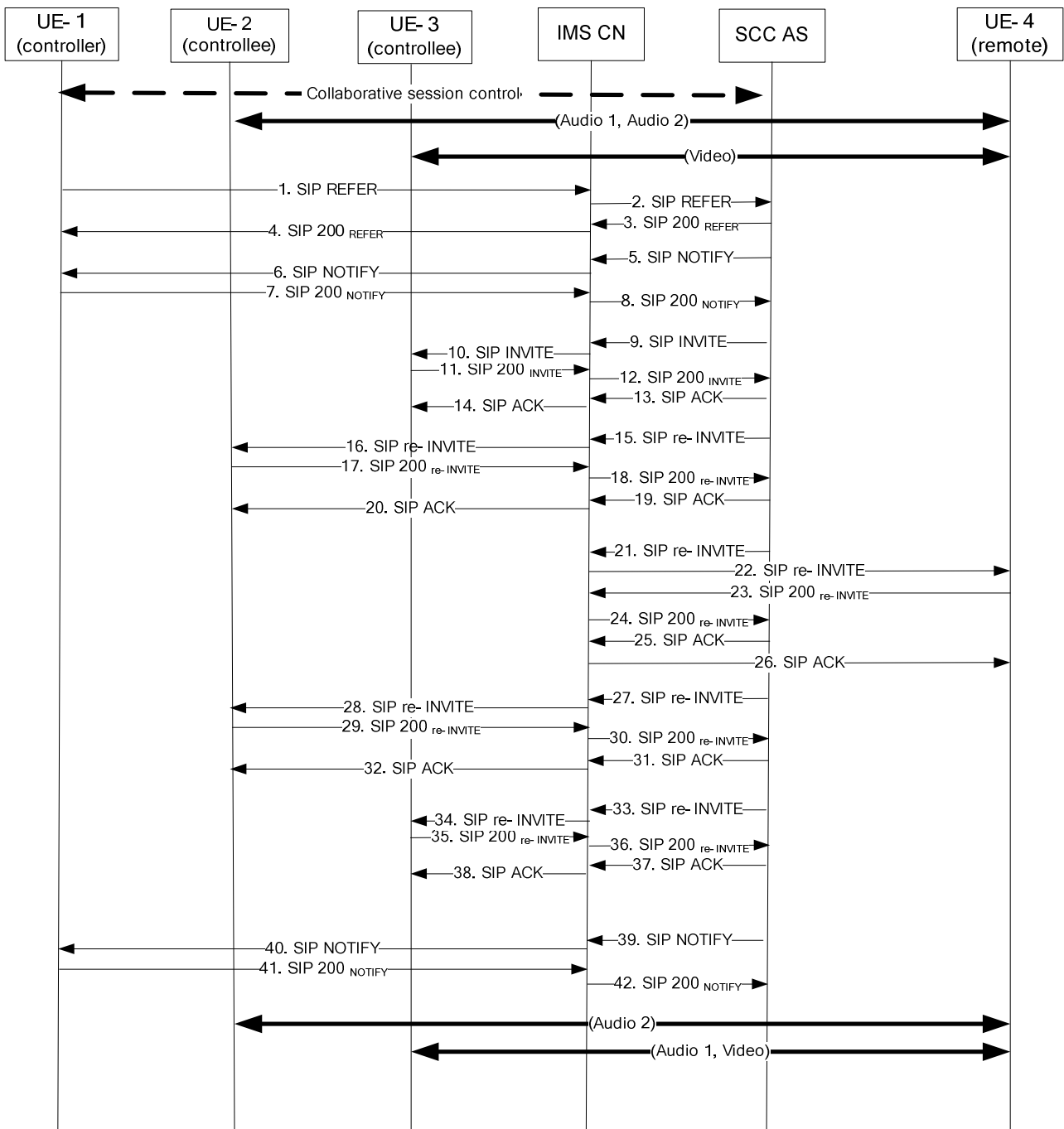


Figure A.5.3A: Controller UE transfers a media from one controllee UE to another controllee UE.

1-2. SIP REFER request (SIP REFER request from UE-1 to SCC-AS)

There is an existing session with audio 1 and audio 2 between UE-2 (123.45.67.89) and the remote UE (132.54.76.98). The video component is unidirectional from the remote UE to the controllee UE, UE-3 (123.112.67.87). The Controller UE attempts to transfer the audio 1 portion of this session to the controllee UE, UE-3.

**Table A.5.3A-1 SIP REFER request (UE-1 to SCC-AS)**

```

REFER sip:scc-as@home1.net SIP/2.0
Via:
To: sip:scc-as@home1.net; tag= 24680
From: sip:user1_public1@home1.net; tag=13579
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 93809824 REFER
Max-Forwards: 70
P-Preferred-Identity: sip:user1_public1@home1.net
Refer-To: <sip:user1_public3@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91e6bf6body=m%3DAudio%20%20RTP%2FAVP%20%0Dm%3DAudio%20
49174%20RTP%2FAVP%2096%0Dm%3Dvideo%201009%20RTP%2FAVP%2098%2099>
Require: target-dialog
Target-dialog: cb03a0s09a2sdfglkj321576;remote-tag=abcdef;local-tag=123456
Referred-By: sip:user1_public1@home1.net
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91ewxyz>;+g.3gpp.iut-controller
Accept: message/sipfrag
Content-Length: 0

```

**3-4. SIP 200 (OK) response (from SCC AS to UE-1)**

The SCC-AS sends a SIP 200 (OK) response to controller UE-1 as response to the SIP REFER request.

**5-6. SIP NOTIFY request (from SCC AS to UE-1)**

The SCC-AS sends a SIP NOTIFY request to UE-1 to notify implicit subscription to the SIP REFER request results.

**Table A.5.3A-2 SIP NOTIFY request (SCC-AS to UE-1)**

```

NOTIFY

To: sip:user1_public1@home1.net;tag=24680
From: sip:scc-as@home1.net;tag=13579
Call-ID: cb03a0s09a2sdfglkj12345
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:scc-as@home1.net
Allow:
Event: refer
Subscription-State:active;expires=3600
Content-Type: message/sipfrag;version=2.0
Content-Length: (...)

SIP/2.0 100 Trying

```

**7-8. SIP 200 (OK) response (from controller UE-1 to SCC-AS)**

The controller UE, UE-1, acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC-AS.

**9-10. SIP INVITE request (from SCC-AS to UE-3)**

Since the message 1-2 contains a Refer-to header field addressed to UE-3 and the URI parameters, listing an audio line which is not currently supported by another controllee UE than UE-2, the SCC AS realizes the procedure is for transferring the media from that controllee UE (UE-2) to controllee UE (UE-3). The SCC-AS sends a SIP INVITE request to the controllee UE, UE-3, to transfer the audio media component. The SDP in the SIP INVITE request lists the media lines within the collaborative session. In order to avoid UE-3 to start sending audio to the remote UE, the SCC-AS adds an a-line set to sendonly in the SDP offer.



**Table A.5.3A-3 SIP INVITE request (SCC-AS to UE-3)**

```

INVITE sip:user1_public3@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public3@home1.net;
From: sip:scc-as@home1.net; tag=12486
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 49174 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
a= sendonly
b=RR:0
b=RS:0m=audio 0 RTP/AVP 0
m=video 1009 RTP/AVP 98 99
a=sendonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**11-12. SIP 200 (OK) response (from UE-3 to SCC-AS)**

The controllee UE, UE-3, acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.5.3A-4 SIP 200 (OK) request (UE-3 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user1_public3@home1.net; tag = xyzwv
From: sip:scc-as@home1.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public3@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
c=123.112.67.87
t=0 0
m=audio 3002 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
a=recvonly
m=audio 0 RTP/AVP 0
m=video 1302 RTP/AVP 98 99
a=recvonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**13-14. SIP ACK request(from SCC-AS to UE-3)**

The SCC-AS sends a SIP ACK request to UE-3 to acknowledge.

**15-16. SIP re-INVITE request (from SCC-AS to controllee UE, UE-2)**

The SCC AS sends a SIP re-INVITE request to controllee UE, UE-2 to put Audio 1 on hold.

**Table A.5.3A-5 SIP INVITE request (SCC-AS to controllee UE, UE-2)**

```

INVITE sip:user1_public2@home3.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public2@home1.net;
From: sip:scc-as@home1.net; tag=12386
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 49174 RTP/AVP 96 97
a=sendonly
b=RR:0
b=RS:0
m=audio 44552 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
a=sendonly
b=RR:0

```

**17-18. SIP 200 (OK) response (from UE-2 to SCC-AS)**

The controllee UE, UE-2 acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.5.3A-6 SIP 200 (OK) response (UE-2 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user1_public2@home1.net; tag = xyzwv
From: sip:scc-as@home1.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=IN IP4 123.45.67.89
t=0 0
m=audio 32324 RTP/AVP 96 97
a=recvonly
m=audio 34002 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
a=recvonly

```

**19-20. SIP ACK request (from SCC-AS to UE-2)**

The SCC-AS sends a SIP ACK request to UE-2 to acknowledge.

**21-22. SIP re-INVITE request (from SCC-AS to remote UE)**

The SCC-AS sends a SIP re-INVITE request to the remote UE, UE-4.

**Table A.5.3A-7 SIP INVITE request (SCC-AS to remote UE, UE-4)**

```

INVITE sip:user2_public1@home3.net;SIP/2.0
Via:
To: sip:user2_public1@home2.net;tag=66666
From: sip:scc-as@home1.net; tag=33333
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact:sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
t=0 0
m=audio 3002 RTP/AVP 96 97
c= IN IP4 123.112.67.87
a=rtpmap:0 PCMU/8000
m=audio 34002 RTP/AVP 96 97
C=IN IP4 123.45.67.89
A=rtpmap:0 PCMU/8000
m=video 1302 RTP/AVP 98 99
c= IN IP4 123.112.67.87
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=recvonly

```

**23-24. SIP 200 (OK) response (from remote UE, UE-4 to SCC-AS)**

The remote UE acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.5.3A-8 SIP 200 (OK) request (UE-4 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Asserted-Identity:
Contact: sip:user2_public1@home2.net;
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c= IN IP4 132.54.76.98
t=0 0
m=audio 49174 RTP/AVP 96 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=audio 44552 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
m=video 1009 RTP/AVP 98 99
a=sendonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=sendonly

```

**25-26. SIP ACK request (from SCC-AS to remote UE)**

The SCC-AS sends a SIP ACK request to the remote UE.

**27-28. SIP re-INVITE request (from SCC-AS to controllee UE, UE-2)**

The SCC-AS sends a SIP re-INVITE request to UE-2 to remove the audio 1 media component.

**Table A.5.3A-9 SIP re-INVITE request (SCC-AS to UE-2)**

```
INVITE sip:user1_public2@home3.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public2@home1.net;
From: sip:scc-as@home1.net; tag=12386
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 0
m=audio 44552 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
```

**29-30. SIP 200 (OK) response (from UE-2 to SCC-AS)**

The controllee UE, UE-2, acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCC-AS.

**Table A.5.3A-10 SIP 200 (OK) response (UE-2 to SCC-AS)**

```
SIP/2.0 200 OK
Via:
To: sip:user1_public2@home1.net; tag = xyzwv
From: sip:scc-as@home1.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=IN IP4 123.45.67.89
t=0 0
m=audio 0 RTP/AVP 0
m=audio 34002 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
```

**31-32. SIP ACK request (from SCC-AS to UE-2)**

The SCC-AS sends a SIP ACK request to UE-2 to acknowledge.

**33-34. SIP re-INVITE request (from SCC-AS to controllee UE, UE-3)**

The SCC-AS sends a SIP re-INVITE request to UE-3 to activate the audio 1 media component.

NOTE: The SIP re-INVITE request is triggered by the SIP REFER request. The previous SIP INVITE request was generated by the SCC AS due to third party call control to allow sending this SIP re-INVITE request.

**Table A.5.3A-11 SIP re-INVITE request (SCC-AS to UE-3)**

```
INVITE sip:user1_public3@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public3@home1.net;
From: sip:scc-as@home1.net; tag=12486
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Referred-By: sip:user1_public1@home1.net
Contact:
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
c=IN IP4 123.112.67.87
t=0 0
m=audio 49174 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
a= sendrecv
m=audio 0 RTP/AVP 0
m=video 1009 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=sendonly
```

**35-36. SIP 200 (OK) response (from controllee UE, UE-3 to SCC-AS)**

Controllee UE, UE-3 sends a SIP 200 (OK) response to the SCC AS.

**37-38. SIP ACK request (from SCC-AS to UE-3)**

The SCC-AS sends a SIP ACK request to the controllee UE, UE-3.

**39-40. SIP NOTIFY request (from SCC-AS to controller UE, UE-1)**

The SCC AS sends a SIP NOTIFY request containing SDP of the SIP 200 (OK) response received from the controllee UE, UE-3.

**Table A.5.3A-12 SIP NOTIFY request (SCC-AS to UE-1)**

```

NOTIFY sip:user1_public1@home1.net;
Via:
To: sip:user1_public1@home1.net; tag=13579
From: sip:scc-as@home1.net; tag= 24680
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: refer
Content-Type: message/sipfrag ;version=2.0 ;
Content-Length: (...)

SIP/2.0 200 OK
To: sip:user1_public3@home1.net; tag = xyzwv
From: sip:scc-as@home1.net; tag = 12486
Call-ID:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
c=123.112.67.87
t=0 0
m=audio 3002 RTP/AVP 96 97
a=rtpmap:0 PCMU/8000
m=audio 0 RTP/AVP 0
m=video 1302 RTP/AVP 98 99
a=recvonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**41-42. SIP 200 (OK) response (from controller UE to SCC-AS)**

The controller UE acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC-AS.

---

## A.6 Signalling flows for release of collaborative session for inter-UE transfer

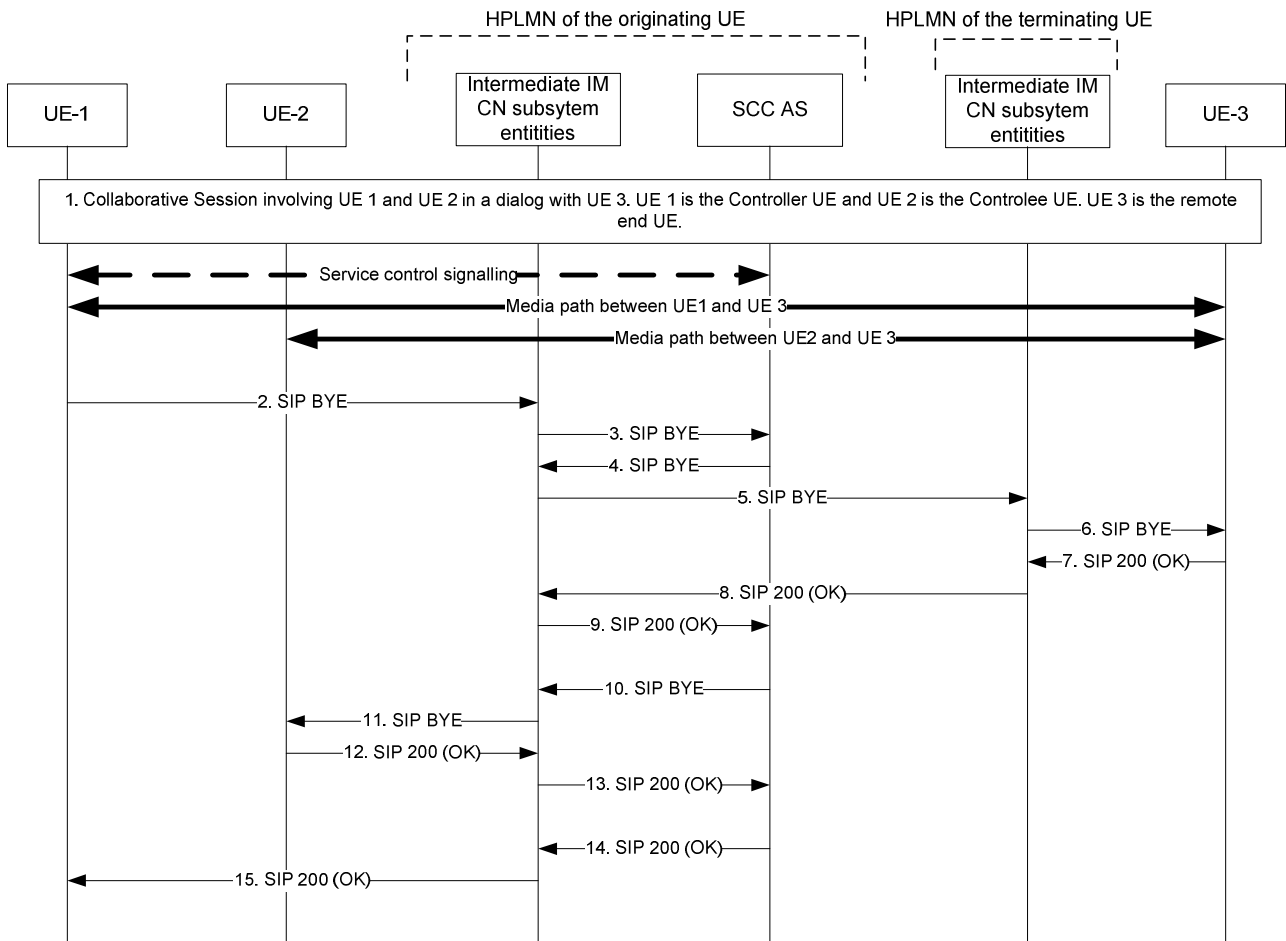
### A.6.1 Introduction

The signalling flows for release of Collaborative Session demonstrate how the session is released by the Controller UE or by the remote party UE. The following signalling flows are included:

- subclause A.6.2 shows an example where the Controller UE initiates the release of a Collaborative Session. It demonstrates how the service control signalling and media path between the Controller UE and remote UE and the media path between the Controllee UE and the remote UE are released as a result of the session release; and
- subclause A.6.3 shows an example where the remote UE initiates the release of a Collaborative Session.

### A.6.2 Controller UE releases collaborative session

In this example, session release is initiated by the Controller UE (UE 1), which is involved in the Collaborative Session with UE 2 and the remote UE (UE 3). The SCC AS ensures that all Controllee UEs involved in the Collaborative Session receive a request for session release in order to completely release the session ongoing with the remote UE.



**Figure A.6.2-1: Release of Collaborative Session initiated by Controller UE**

NOTE 1: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

**1. Collaborative Session currently exists in a dialog with UE 3**

A Collaborative Session involving UE 1 and UE 2 exists in a dialog with UE 3. Media paths exist between UE 1 and UE 3 and between UE 2 and UE 3. In this scenario, UE 1 is the Controller UE in the Collaborative Session and thus maintains service control signalling with the SCC AS.

**2-3. SIP BYE request (UE 1 to SCC AS via intermediate IM CN subsystem entities)**

UE 1, acting as the Controller UE, initiates session release by sending a SIP BYE request towards the SCC AS. There is no Inter UE transfer specific content in the SIP BYE request.

**4-6. SIP BYE request (SCC AS to UE 3 via intermediate IM CN subsystem entities)**

The SCC AS routes the SIP BYE request to UE 3 indicating to the remote UE that the Controller UE requests that the session is to be released.

**7-9. SIP 200 (OK) response (UE 3 to SCC AS via intermediate IM CN subsystem entities)**

UE 3 responds to the received SIP BYE request with a SIP 200 (OK) response.

**10-11. SIP BYE request (SCC AS to UE 2 via intermediate IM CN subsystem entities)**

The SCC AS, acting as a routing B2BUA, sends a SIP BYE request towards UE 2 to release the dialog it is involved in with UE 3 via the Collaborative Session. There is no Inter UE transfer specific content in the SIP BYE request.

NOTE 1: The SIP BYE request to UE 2 (step 10) can occur in parallel with the SIP BYE request to UE 3 (step 4). Alternatively, the SCC AS can send the SIP BYE request to UE 2 prior to sending the SIP BYE request to UE 3.

**12-13. SIP 200 (OK) response (UE 2 to SCC AS via intermediate IM CN subsystem entities)**

UE 2 responds to the received SIP BYE request with a SIP 200 (OK) response.

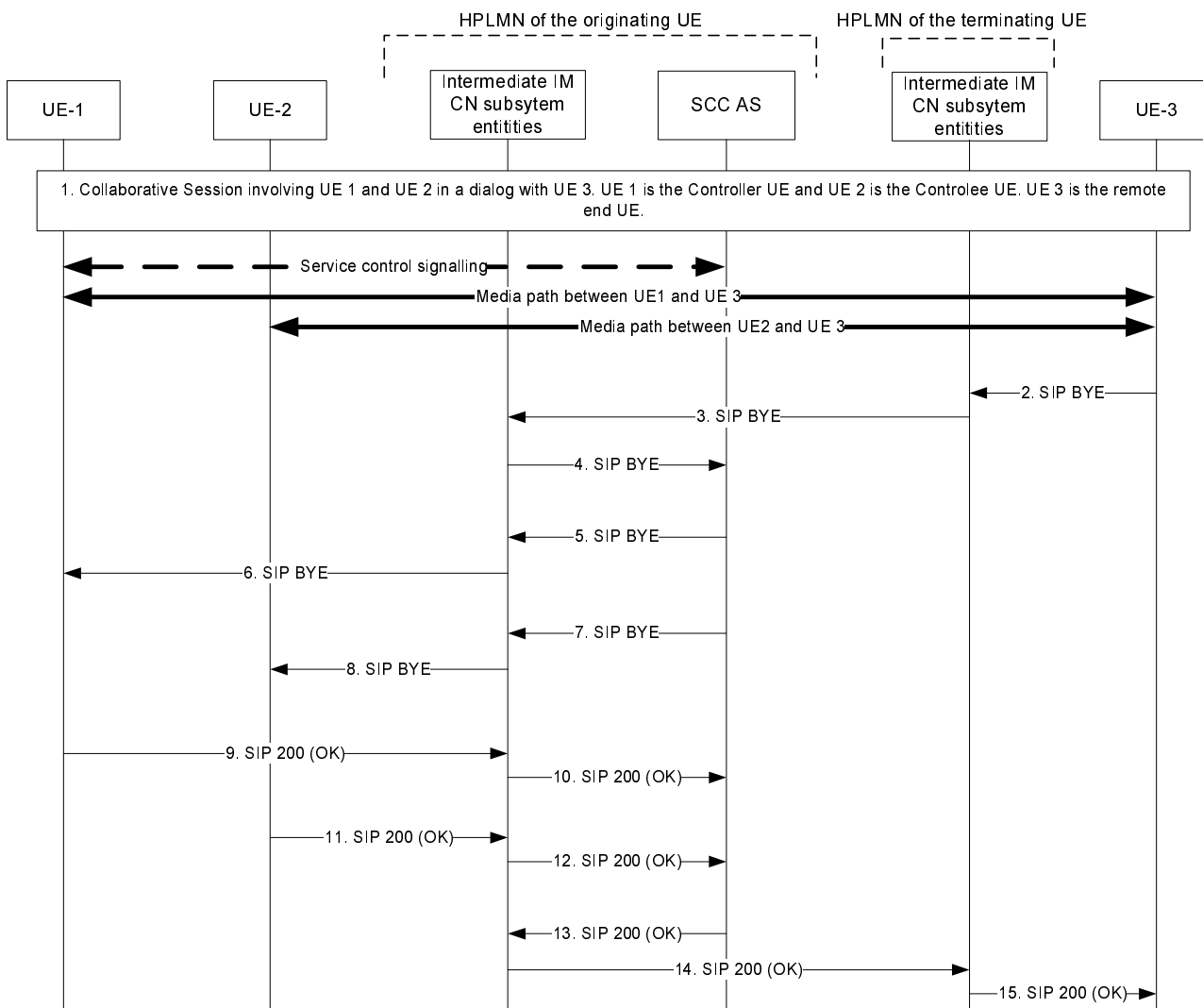
**14-15 SIP 200 (OK) response (SCC AS to UE 1 via intermediate IM CN subsystem entities)**

Upon receiving SIP 200 (OK) responses from UE 2 and UE 3, the SCC AS responds to the SIP BYE request from UE 1 with a SIP 200 (OK) response.

NOTE 2: The SIP 200 (OK) response in step 7 can be sent earlier by the SCC AS in response to the SIP BYE request received from UE 1(step 3). For example, the SCC AS can send the SIP 200 (OK) response to UE 1 after receiving the SIP 200 (OK) response from UE 3 (step 9).

### A.6.3 Remote UE releases collaborative session

In this example, session release is initiated by the remote UE (UE 3). UE 1 and UE 2 are included in a Collaborative Session with the remote UE. The SCC AS ensures that all Controllee UEs involved in the Collaborative Session receive a request for session release in order to completely release the ongoing session.



**Figure A.6.3-1: Release of Collaborative Session initiated by remote UE**

NOTE 1: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.



### 1. Collaborative Session currently exists in a dialog with UE 3

A Collaborative Session involving UE 1 and UE 2 exists in a dialog with UE 3. Media paths exist between UE 1 and UE 3 and between UE 2 and UE 3. In this scenario, UE 1 is the Controller UE in the Collaborative Session and thus maintains service control signalling with the SCC AS.

### 2-4. SIP BYE request (UE 3 to SCC AS via intermediate IM CN subsystem entities)

The remote UE, UE 3, initiates session release by sending a SIP BYE request towards the Controller UE via the SCC AS serving the Controller UE. There is no Inter UE transfer specific content in the SIP BYE request.

### 5-6. SIP BYE request (SCC AS to UE 1 via intermediate IM CN subsystem entities)

The SCC AS routes the SIP BYE request to UE 1, indicating to UE 1 that the remote UE requests that the session is to be released.

### 7-8. SIP BYE request (SCC AS to UE 2 via intermediate IM CN subsystem entities)

The SCC AS, acting as a routing B2BUA sends a SIP BYE request to UE 2 to release the dialog it is involved in with UE 3 via the Collaborative Session. There is no Inter UE transfer specific content in the SIP BYE request.

NOTE 1: Step 7 can occur in parallel with step 5. Alternatively, step 7 can occur prior to step 5. The order in which the SCC AS sends the SIP BYE requests is not considered to be important.

### 9-10. SIP 200 (OK) response (UE 1 to SCC AS via intermediate IM CN subsystems entities)

UE 1 responds to the received SIP BYE request with a SIP 200 (OK) response.

NOTE 2: Step 9 can occur immediately after UE1 has received the SIP BYE request in step 6.

### 11-12. SIP 200 (OK) response (UE 2 to SCC AS via intermediate IM CN subsystems entities)

UE 2 responds to the received SIP BYE request with a SIP 200 (OK) response.

### 13-15. SIP 200 (OK) response (SCC AS to UE 3 via intermediate IM CN subsystem entities)

Upon receiving SIP 200 (OK) responses from UE 1 and UE 2, the SCC AS responds to the SIP BYE request from UE 3 with a SIP 200 (OK) response.

NOTE 3: Step 13 can occur after the SCC AS has received the SIP BYE request step 4 since it is not necessary to wait for SIP BYE requests to UE1 and UE2.

---

## A.7 Signalling flows for addition and deletion of media within collaborative session for inter-UE transfer

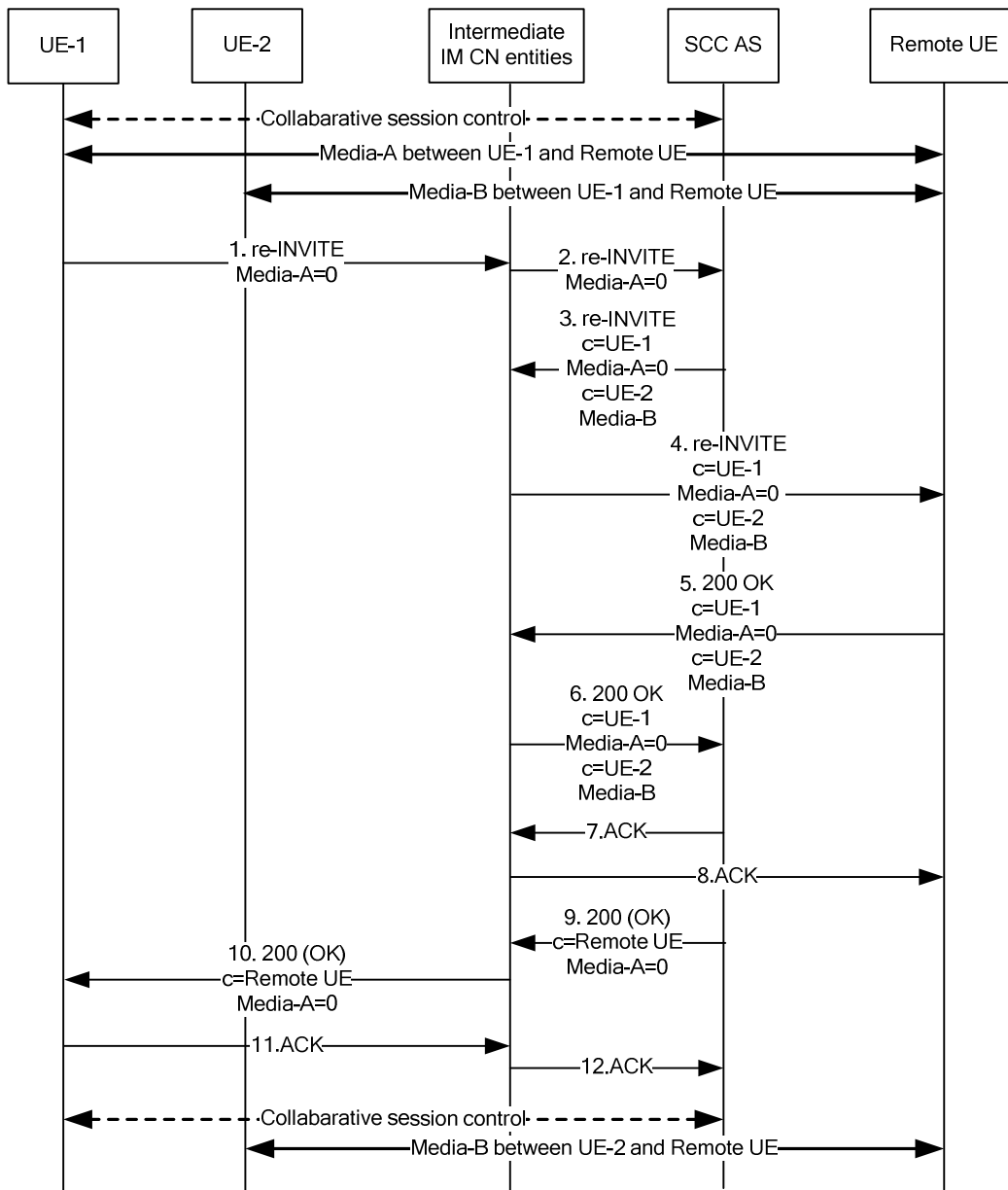
### A.7.1 Introduction

This subclause shows signalling flows for adding and releasing of mediacomponent by the controller UE. Four different scenarios are considered in this subclause:

- scenario where the controller UE adds a new media component on a controllee UE. The procedures in this subclause are the same as the procedures described in subclause A.4.3 with the exception that upon the receipt of a SIP REFER request from the controller UE, the SCC AS generates a SIP re-INVITE request within the dialog to the controllee UE instead of a SIP INVITE request;
- scenario where the controller UE releases a media component from the controller UE, see subclause A.7.2.1;
- scenario where the controller UE releases a media component from the controllee UE, see subclause A.14.2.2.1; and
- scenario where the controller UE releases a media component from the controllee UE and that causes the termination of the collaborative session, see subclause A.7.2.2.2.

## A.7.2 Controller UE releases media

### A.7.2.1 Controller UE releases media flow on controller UE



**Figure A.7.2.1: Controller UE releases media flow on controller UE**

NOTE 1: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

It is assumed that UE-1 is the controller UE having collaborative session control. A user has a multimedia session on his device UE-1 with voice (Media A) and UE-2 with video (Media B) media flows. Subsequently, the UE-1 (controller UE) removes the media A flow that is active on the remote UE.

#### 1. SIP re-INVITE request (UE-1 to intermediate IM CN subsystem entities)- see example in table A.7.2.1-1

UE-1 sends a SIP re-INVITE request towards the remote UE indicating Media A is to be removed in the SDP offer.

**Table A.7.2.1-1: SIP re-INVITE request (UE-1 to intermediate IM CN subsystem entities)**

```

INVITE <sip:userR_public@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6> SIP/2.0
Via:SIP/2.0/UDP [3333::eee:fff:aaa:bbb]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf1.visited1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From:
To:
Call-ID:
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Supported: 100rel, precondition
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_public@home1.net>;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c67t6br4>;+g.3gpp.iut-controller
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 3333::aaa:bbb:ccc:ddd
s=-
t=0 0
m=audio 0 RTP/AVP 97
c=IN IP6 3333::aaa:bbb:ccc:ddd
a=rtpmap:97 PCMU/8000
m=video 0 RTP/AVP 98
c=IN IP6 4444::aaa:bbb:ccc:ddd
a=rtpmap:98 MPV/90000

```

**2. SIP re-INVITE request**

The intermediate IM CN subsystem entities forward the SIP re-INVITE request to the SCC AS according to standard IMS procedure.

**3. SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities) - see example in table A.14.2.1-3**

The SCC AS sends a SIP re-INVITE request with all the media information at the remote UE, sets the port number for media A to 0, and forwards it towards the remote UE through the intermediate IM CN subsystem entities.

**Table A.7.2.1-3: SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities)**

```

INVITE <sip:userR_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6> IP/2.0
Via: SIP/2.0/UDP sccas1.home1.net;branch=z9hG4bK240f34.12
Max-Forwards: 70
Route: <sip:orig@scscf1.home1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From:
To:
Call-ID:
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Supported: 100rel, precondition
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:
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
Accept: application/sdp, application/3gpp-ims+xml
Content-Length: (...)
v=0
o=- 2987933615 2987933615 IN IP6 3333::aaa:bbb:ccc:ddd
s=-
t=0 0
m=audio 0 RTP/AVP 97
c=IN IP6 3333::aaa:bbb:ccc:ddd
a=rtpmap:97 MPV/90000
m=video 8888 RTP/AVP 98
c=IN IP6 4444::aaa:bbb:ccc:ddd
a=rtpmap:98 MPV/90000

```

**4. SIP re-INVITE request**

The intermediate IM CN subsystem entities forward the SIP re-INVITE request to the remote UE according to standard IMS procedure.

**5. SIP 200 (OK) response (remote UE to intermediate IM CN subsystem entities) - see example in table A.14.2.1-5**

The remote UE sends a SIP 200 (OK) response with an SDP answer.

**Table A.7.2.1-5: SIP 200 (OK) response (remote UE to IM CN subsystem entities)**

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscaf2.visited2.net;branch=dahtadfz4radgs.12, SIP/2.0/UDP
scscf2.home1.net;branch=hsdfldf343.12, SIP/2.0/UDP
scscf1.home1.net;branch=hsdfldf56322cc.13, SIP/2.0/UDP
sccas1.home1.net;branch=z9hG4bKnas34r2.21
From:
To:
Call-ID:
Cseq: 127 INVITE
Supported: 100rel; precondition
Contact:
Allow:
Accept: application/sdp;
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=audio 0 RTP/AVP 97
a=rtpmap:97 MPV/90000
m=video 6666 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

**6. SIP 200 (OK) response****7. SIP ACK request (SCC AS to intermediate IM CN subsystem entities)**

The SCC AS sends a SIP ACK request to the remote UE through the intermediate IM CN subsystem entities.

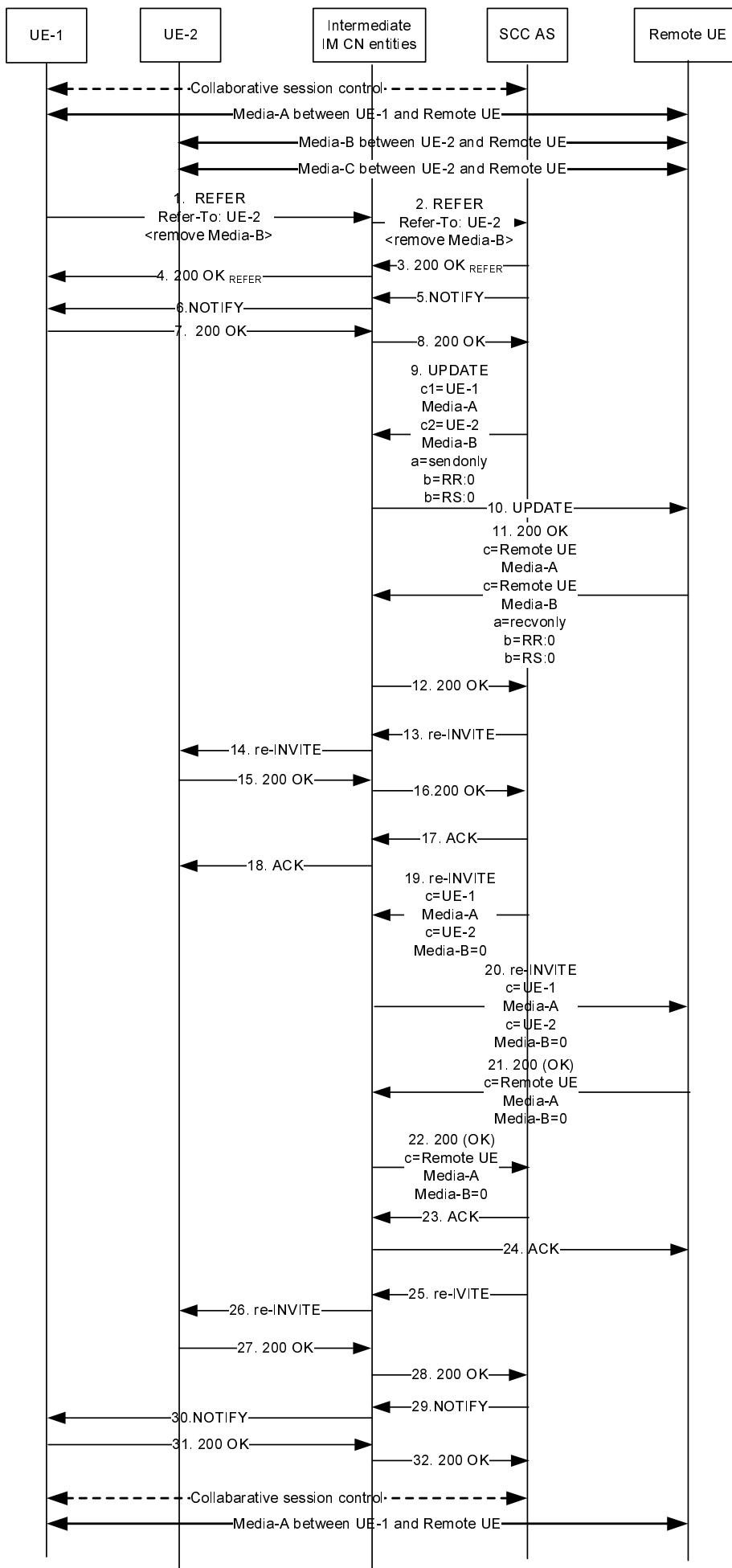
**8. SIP ACK request (intermediate IM CN subsystem entities to remote UE)****9-10. SIP 200 (OK) response (SCC AS to UE-1 through intermediate IM CN subsystem entities)**

The SCC AS sends a SIP 200 (OK) response with an SDP answer indicating that Media-A has been removed

**11-12. SIP ACK request (controller UE to SCC AS)**

## A.7.2.2 Controller UE releases media flow on controllee UE

### A.7.2.2.1 Controller UE removes media at the controllee UE



NOTE 1: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

### Figure A.7.2.2.1: Controller UE remove media at the controllee UE

1-2. SIP REFER request (controller UE to intermediate IM CN subsystem entities) – see example in table A.14.2.1-1

It is assumed that UE-1 is the controller UE having collaborative session control. A user has a multimedia session on his device UE-1 with a voice (Media A) and UE-2 (Controllee UE) with a video (Media B) media flows and a voice (Media C) media flow. The controller UE wants to remove the video media (Media B) component on the controllee UE.

**Table A.7.2.2.1-1 SIP REFER request (UE-1 to SCC AS)**

```
REFER sip:interUEtransfer@sccas1.home1.net SIP/2.0
Via:
To: sip:interUEtransfer@sccas1.home1.net
From: sip:user1_public1@home1.net;tag=13579
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 93809824 REFER
Max-Forwards: 70
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
Refer-To: <sip:user2_public2@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-00a0c91e6bf6?
body=m%3Daudio%20%20RTP%2FAVP%2097%0Dm%3Daudio%204568%20RTP%2FAVP%2097%0Dm%3Dvideo%20%20R
TP%2FAVP%2098>
Require: target-dialog
Target-dialog: cb03a0s09a2sdfglkj13579;to-tag=abcdef;from-tag=123456
Referred-By: sip:user1_public1@home1.net
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91ewxyz>;+g.3gpp.iut-controller
Allow:
Accept: message/sipfrag
Content-Length: 0
```

### 3-4. SIP 200 (OK) response

The SCC-AS sends a SIP 200 (OK) response to the controller UE-1 as response to the SIP REFER request.

### 5-6. SIP NOTIFY request (SCC AS to UE-1 through intermediate IM CN subsystem entities)-see example in table A.7.2.1-5

The SCC-AS sends a SIP NOTIFY request to UE-1 to notify implicit subscription to the SIP REFER request results.

**Table A.7.2.2.1-5 SIP NOTIFY request (SCC AS to UE-1)**

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz SIP/2.0
Via:
To: sip:user1_public1@home1.net;tag=13579
From: sip:interUEtransfer@sccas1.home1.net;tag=2255
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: refer
Subscription-State: active;expires=3600
Content-Type: message/sipfrag ;version=2.0
Content-Length: (...)

SIP/2.0 100 Trying
```

### 7-8. SIP 200 (OK) response (UE-1 to SCC-AS through intermediate IM CN subsystem entities)

The controller UE, UE-1, acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS.

### 9-10. SIP UPDATE request (SCC AS to remote UE through intermediate IM CN subsystem entities) - see example in table A.7.2.2-9.



The SCC AS prepares the removal of the media component received by the controllee UE-2 and sent by the remote UE.

**Table A.7.2.2-9: SIP UPDATE request (SCC AS to remote UE through intermediate IM CN subsystem entities)**

```

UPDATE sip:userR_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-00a0c91e6bf6 SIP/2.0
Via:
To:
From:
Call-ID:
Cseq:
Contact: <sip: user1_public@home1.net>; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c67t6br4>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 3333::aaa:bbb:ccc:ddd
s=-
t=0 0
m=audio 6666 RTP/AVP 97
c=IN IP6 3333::aaa:bbb:ccc:ddd
a=rtpmap:97 PCMU/8000
m=video 6668 RTP/AVP 98
a=sendonly
b=RR:0
b=RS:0
c=145.23.77.88
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0

```

**11-12. SIP 200 (OK) response (remote UE to intermediate IM CN subsystem entities) - see example in table A.14.2.2-11.**

Remote UE send a SIP 200 (OK) response with SDP answer.

**Table A.7.2.2-11 SIP 200 (OK) response (remote UE to intermediate IM CN subsystem entities)**

```

SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
Cseq:
Contact: <sip:userR_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-00a0c91e6bf6>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 5555::aaa:bbb::ccc:ddd
s=-
t=0 0
m=audio 4444 RTP/AVP 97
c=IN IP6 5555::aaa:bbb::ccc:ddd
a=rtpmap:9777 PCMU/8000
m=video 6666 RTP/AVP 98
a=recvonly
b=RR:0
b=RS:0
c=145.23.77.88
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0

```

**13. SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities) - see example in table A.14.2.2-13**

The SCC AS sends a SIP re-INVITE request towards the Controllee UE (UE-2).

**Table A.7.2.2.1-13 SIP re-INVITE request (SCC-AS to IM CN subsystem entities)**

```

INVITE sip:user2_public1@home1.net;gr=urn:uuid:f 81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
Route:
To: sip:user2_public1@home1.net;abcdef
From: sip:user3_public3@home3.net;tag=123456
Call-ID:
CSeq:
Max-Forwards:
Require:
Referred-By: sip:user1_public1@home1.net
Contact: sip:user3_public3@home3.net;gr=urn:uuid:f81d4fae-17oct-11a1-a678-0054c91eabcd
Allow:
Content-Type: application/sdp
Content-Length:(...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
t=0 0
m=audio 0 RTP/AVP 97
m=audio 4568 RTP/AVP 97
c=123.112.67.87
b=AS:75
a=rtpmap:97 PCMU/8000
m=video 0 RTP/AVP 98
a=rtpmap:98 MPV/90000
a=sendonly

```

**14. SIP re-INVITE request (intermediate IM CN subsystem entities to UE-2)**

**15-16. SIP 200 (OK) response (UE-2 to SCC AS through intermediate IM CN subsystem entities)**

**17-18. SIP ACK request (from SCC-AS to UE-2)**

**19. SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities) - see example in table A.14.2.2-19**

The SCC AS sends a SIP re-INVITE request with all the media information at the remote UE, set the port number for media B to 0, and forwards it to the remote UE through the intermediate IM CN subsystem entities.

**Table A.7.2.2.1-19: SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities)**

```

INVITE <sip:userR_public1@homel.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-00a0c91e6bf6> SIP/2.0
Via: SIP/2.0/UDP sccasl.homel.net;branch=z9hG4bKnas34r2.12
Max-Forwards: 70
Route: <sip:orig@scscf1.homel.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@homel.net>
Privacy: none
From:
To:
Call-ID:
Cseq: 127 INVITE
Supported: 100rel, precondition
Contact: <sip: user1_public@homel.net>; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c67t6br4>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
Accept: application/sdp
Content-Length:(..)

v=0
o=- 2987933615 2987933615 IN IP6 3333::aaa:bbb:ccc:ddd
s=-
c=IN IP6 3333::aaa:bbb:ccc:ddd
t=0 0
m=audio 6666 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=audio 4567 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 0 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

**20. SIP re-INVITE request (intermediate IM CN subsystem entities to remote UE)****21. SIP 200 (OK) response (remote UE to intermediate IM CN subsystem entities) - see example in table A.14.2.1-21**

The remote UE sends a SIP 200 (OK) response with an SDP answer.

**Table A.7.2.2.1-21 SIP 200 (OK) (remote UE to intermediate IM CN subsystem entities)**

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net;branch=343asdfaredfat2.12, SIP/2.0/UDP
scscf2.homel.net;branch=fsc35avhthaz4.22, SIP/2.0/UDP
scscf1.homel.net;branch=fsc35avhthaz4.12, SIP/2.0/UDP
sccasl.homel.net;branch=z9hG4bKnas34r2.14
From:
To:
Call-ID:
Cseq: 127 INVITE
Supported: 100rel; precondition
Contact:
Allow:
Accept: application/sdp;
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 5555::aaa:bbb::ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb::ccc:ddd
t=0 0
m=audio 4444 RTP/AVP 97
a=rtpmap:9777 PCMU/8000
m=audio 4545 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 0 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

**22. SIP 200 (OK) response (intermediate IM CN subsystem entities to SCC AS)****23-24. SIP ACK request (SCC AS to remote UE)****25-26. SIP re-INVITE request (SCC AS to UE-2 through intermediate IM CN subsystem entities)**

SCC AS sends a SIP re-INVITE request towards Controllee UE (UE-2).

NOTE: The SIP re-INVITE request is triggered by the SIP REFER request. The previous SIP INVITE request was generated by the SCC AS due to third party call control to allow sending this SIP re-INVITE request.

**Table A.7.2.2.1-25 SIP re-INVITE request (SCC-AS to UE-2)**

```
INVITE sip:user2_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
Route:
To: sip:user2_public1@home1.net;abcdef
From: sip:user3_public3@home3.net;tag=123456
Call-ID:
CSeq:
Max-Forwards:
Contact: sip:user3_public3@home3.net;gr=urn:uuid:f81d4fae-17oct-11a1-a678-0054c91eabcd
Allow:
Referred-By: sip:user1_public1@home1.net
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
t=0 0
m=audio 0 RTP/AVP 97
m=audio 4568 RTP/AVP 97
c=123.112.67.87
b=AS:75
a=rtpmap:97 PCMU/8000
m=video 0 RTP/AVP 98
```

**27-28. SIP 200 (OK) response (UE-2 to SCC AS through intermediate IM CN subsystem entities)**

**29-30. SIP NOTIFY request (SCC-AS to UE-1)-see example table A.7.2.2.1-21**

The SCC AS sends a SIP NOTIFY request to the controller UE, UE-1 to inform about the success status of the inter-UE transfer.

**Table A.7.2.2.1-29 SIP NOTIFY request (SCC AS to UE-1)**

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz SIP/2.0
Via:
To: sip:user1_public1@home1.net;tag = 13579
From: sip:interUEtransfer@sccas1.home1.net;tag=2255
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: refer
Subscription-State:terminated; reason=noresource
Content-Type: message/sipfrag ;version=2.0
Content-Length: (...)

SIP/2.0 200 OK
Content-Type: application/sdp

v=0
s=-
m=audio 3434 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 0 RTP/AVP 98
a=rtpmap:98 MPV/90000
a=sendonly
```

**31-32. SIP 200 OK response (UE-1 to SCC AS)**

The controller UE,UE-1 acknowledges the SIP NOTIFY request by sending a SIP 200 OK response to the SCC AS.

A.7.2.2.2 Controller UE remove the controllee UE from the collaborative session

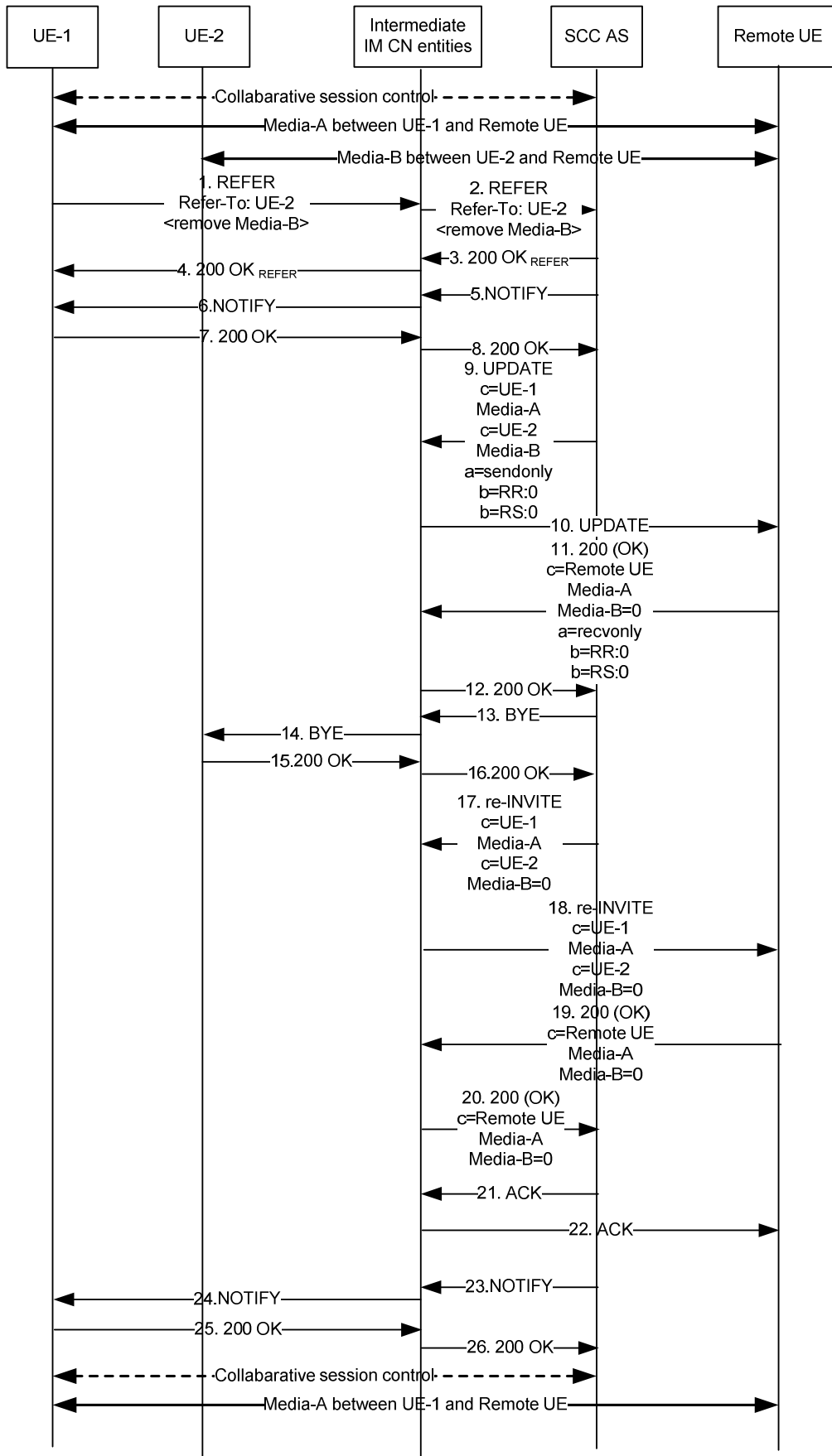


Figure A.7.2.2.2: Controller UE remove the controllee UE from the collaborative session

NOTE 1: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

**1-2. SIP REFER request (controller UE to intermediate IM CN subsystem entities) – see example in table A.14.2.2.2-1**

It is assumed that UE-1 is the controller UE having collaborative session control. A user has a multimedia session on his device UE-1 with a voice (Media A) and UE-2(Controllee UE) with a video (Media B) media flow. The controller UE wants to remove the controllee UE from the collaborative session.

**Table A.7.2.2.2-1 SIP REFER request (UE-1 to SCC-AS)**

```
REFER sip:interUEtransfer@sccas1.home1.net SIP/2.0
Via:
To: sip:interUEtransfer@sccas1.home1.net
From: sip:user1_public1@home1.net;tag = 13579
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 93809824 REFER
Max-Forwards: 70
P-Preferred-Identity:
Refer-To: <sip:user2_public2@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-
00a0c91e6bf6;method=BYE>
Require: target-dialog
Target-dialog: cb03a0s09a2sdfglkj13579; to-tag=abcdef; from-tag=123456
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91ewxyz>;+g.3gpp.iut-controller
Allow:
Referred-By: sip:user1_public1@home1.net
Accept:
Content-Type:
Content-Length:
```

**3-4. SIP 200 (OK) response**

The SCC AS sends a SIP 200 (OK) response to the controller UE-1 as response to the SIP REFER request.

**5-6. SIP NOTIFY request (SCC AS to UE-1 through intermediate IM CN subsystem entities) – see example in table A.7.2.2.2-5**

The SCC AS sends a SIP NOTIFY request to UE-1 to notify implicit subscription to the SIP REFER request results.

**Table A.7.2.2.2-5 SIP NOTIFY request (SCC AS to UE-1)**

```
NOTIFY
Via:
To: sip:user1_public1@home1.net;tag=13579
From: sip:interUEtransfer@sccas1.home1.net;tag=2255
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: refer
Subscription-State: active;expires=3600
Content-Type: message/sipfrag ;version=2.0
Content-Length: (...)

SIP/2.0 100 Trying
```

**7-8. SIP 200 (OK) response (UE-1 to SCC AS through intermediate IM CN subsystem entities)**

The controller UE, UE-1, acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) to the SCC AS.

**9-10. SIP UPDATE request (SCC AS to remote UE through intermediate IM CN subsystem entities) - see example in table A.7.2.2.2-9.**

The SCC AS prepares the removal of the controllee UE-2 from the collaborative session by stopping the media received by the controllee UE-2 and sent by the remote UE.

**Table A.7.2.2.2-9: SIP UPDATE request (SCC AS to Remote UE through intermediate IM CN subsystem entities)**

```
UPDATE sip:userR_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-00a0c91e6bf6 SIP/2.0
Via:
To:
From:
Call-ID:
Cseq:
Contact: <sip: user1_public@home1.net>; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c67t6br4>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 3333::aaa:bbb:ccc:ddd
s=-
t=0 0
m=audio 6666 RTP/AVP 97
c=IN IP6 3333::aaa:bbb:ccc:ddd
a=rtpmap:97 PCMU/8000
m=video 6668 RTP/AVP 98
a=sendonly
b=RR:0
b=RS:0
c=145.23.77.88
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
```

**11-12. SIP 200 (OK) response (Remote UE to intermediate IM CN subsystem entities) - see example in table A.14.2.2-11.**

Remote UE sends a SIP 200 (OK) response with SDP answer.

**Table A.7.2.2.2-11 SIP 200 (OK) response (Remote UE to intermediate IM CN subsystem entities)**

```
SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
Cseq:
Contact: <sip:userR_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-00a0c91e6bf6>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 5555::aaa:bbb::ccc:ddd
s=-
t=0 0
m=audio 4444 RTP/AVP 97
c=IN IP6 5555::aaa:bbb::ccc:ddd
a=rtpmap:9777 PCMU/8000
m=video 6666 RTP/AVP 98
a=recvonly
b=RR:0
b=RS:0
c=145.23.77.88
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
```

**13-14. SIP BYE request (SCC AS to UE-2 through intermediate IM CN subsystem entities)**

The SCC AS sends a SIP BYE request towards the controllee UE (UE-2).



**15-16. SIP 200 (OK) response (UE-2 to SCC AS through intermediate IM CN subsystem entities)****17. SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities) - see example in table A.14.2.2.2-17**

The SCC AS sends a SIP re-INVITE request with all the media information at the remote UE, set the port number for media B to 0, and forwards it to the remote UE through the intermediate IM CN subsystem entities.

**Table A.7.2.2.2-17: SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities)**

```

INVITE <sip:userR_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-00a0c91e6bf6> SIP/2.0
Via: SIP/2.0/UDP sccas1.home1.net;branch=z9hG4bKnas34r2.12
Max-Forwards: 70
Route: <sip:orig@scscf1.home1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user1_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From:
To:
Call-ID:
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Supported: 100rel, precondition
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_public@home1.net>; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c67t6br4>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
Accept: application/sdp, application/3gpp-ims+xml
Content-Length:0

v=0
o=- 2987933615 2987933615 IN IP6 3333::aaa:bbb:ccc:ddd
s=-
c=IN IP6 3333::aaa:bbb:ccc:ddd
t=0 0
m=audio 6666 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 0 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

**18. SIP re-INVITE request (intermediate IM CN subsystem entities to remote UE)****19. SIP 200 (OK) response (remote UE to intermediate IM CN subsystem entities) - see example in table A.14.2.2.2-19**

The remote UE sends a SIP 200 (OK) response with SDP answer.

**Table A.7.2.2.2-19 SIP 200 (OK) response (remote UE to intermediate IM CN subsystem entities)**

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net;branch=343asdfaredfat.12, SIP/2.0/UDP
     scscf2.home1.net;branch=fsc35avhthaz4.22, SIP/2.0/UDP
     scscf1.home1.net;branch=fsc35avhthaz4.12, SIP/2.0/UDP
     sccas1.home1.net;branch=z9hG4bKnas34r2.14
From:
To:
Call-ID:
Cseq: 127 INVITE
Supported: 100rel; precondition
Contact:
Allow:
Accept: application/sdp;
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 5555::aaa::bbb::ccc::ddd
s=-
c=IN IP6 5555::aaa::bbb::ccc::ddd
t=0 0
m=audio 4444 RTP/AVP 97
a=rtpmap:9777 PCMU/8000
m=video 0 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

**20. SIP 200 (OK) response (intermediate IM CN subsystem entities to SCC AS)****21-22. SIP ACK request (SCC AS to remote party)****23-24. SIP NOTIFY request (SCC-AS to UE-1)-see example in table A.7.2.2.2-25**

The SCC-AS sends a SIP NOTIFY request to the controller UE, UE-1 to inform about the success status of the inter-UE transfer.

**Table A.7.2.2.2-23 SIP NOTIFY request (SCC-AS to UE-1)**

```

NOTIFY
Via:
To: sip:user1_public1@home1.net;tag = 13579
From: sip:interUEtransfer@sccas1.home1.net;tag=2255
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip: scc-as@home1.net
Allow:
Event: refer
Subscription-State:terminated; reason=noresource
Content-Type: message/sipfrag ;version=2.0
Content-Length: (...)

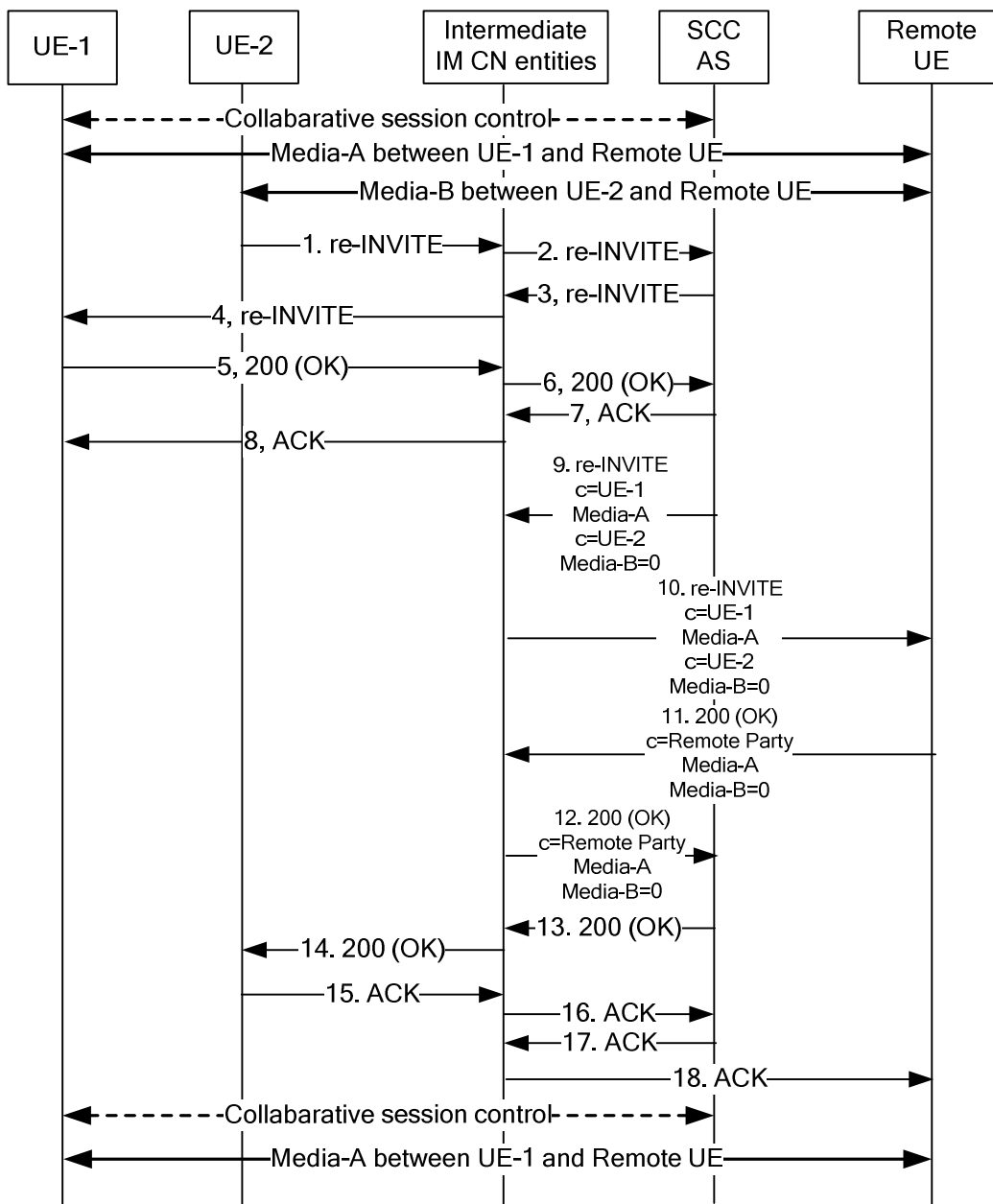
SIP/2.0 200 OK

```

**25-26. SIP 200 OK response (UE-1 to SCC-AS)**

The controller UE,UE-1 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS.

### A.7.4 Controllee UE releases media



**Figure A.7.4: Controllee UE releases media**

NOTE 1: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

It is assumed that UE-1 is controller UE having collaborative session control. a user has a multimedia session on his device UE-1 with voice (Media A) and UE-2(Controllee UE) video (Media B) media flows. Subsequently, the UE-2 (Controllee UE) removes the media B flow that is active on the remote UE.

**1-2. SIP re-INVITE request (UE-2 to SCC AS through IM CN subsystem entities)**

A UE-2 wants to release media B active on the remote UE. For this purpose the UE-2 sends a SIP re-INVITE request to the SCC AS through the IM CN subsystem entities.

**3. SIP re-INVITE request (from SCC-AS to intermediate IM CN subsystem entities) - see example in table A.14.4-3**

The SCC AS sends SIP re-INVITE request to controller UE, UE-1 to inform that the controllee UE wants to release one media, and SCC AS would like to add this media back to the controller UE.

**Table A.7.4-3: SIP re-INVITE request (SCC AS to controller UE)**

```

INVITE <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-00a0c91e6bf6> SIP/2.0
Via: SIP/2.0/UDP sccas1.home1.net;branch=z9hG4bKnas34r2.12
Max-Forwards: 70
Route: <sip:orig@scscf1.home1.net;lr>
P-Asserted-Identity: "John Doe" <sip:user3_public3@home3.net>
Privacy: none
From:
To:
Call-ID:
Cseq: 127 INVITE
Require:
Contact: <sip: user3_public3@home3.net>; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c67t6br4>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
Content-type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 3333::aaa:bbb:ccc:ddd
s=-
t=0 0
m=audio 5555 RTP/AVP 97
c=IN IP6 3333::aaa:bbb:ccc:ddd
a=rtpmap:97 PCMU/90000
m=video 3000 RTP/AVP 98
c=IN IP6 4444::aaa:bbb:ccc:ddd
a=rtpmap:98 MPV/90000

```

**4. SIP re-INVITE request (intermediate IM CN subsystem entities to controller UE, UE-1)****5. SIP 200 (OK) response (controller UE, UE-1 to intermediate IM CN subsystem entities) - see example in table A.7.4-5**

In this case, the controller UE does not want to add this media on itself, but like to delete this media within the collaborative session. The controller UE acknowledges the SIP re-INVITE request by sending SIP 200 (OK) response to the SCC AS with the port number set to zero for this media.

**Table A.7.4-5: SIP 200 (OK) (controller UE to SCC AS)**

```

SIP/2.0 200 OK
Via:
From:
To:
Call-ID:
Cseq:
Contact: <sip: user1_public1@home1.net>; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c43t6br4>;+g.3gpp.iut-controller
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 5555::aaa:bbb::ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb::ccc:ddd
t=0 0
m=audio 4444 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 0 RTP/AVP 98
a=rtpmap:98 MPV/9000

```

**6. SIP 200 (OK) response (intermediate IM CN subsystem entities to SCC AS)****7-8.SIP ACK (SCC AS to controller UE)****9. SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities)-see example in table A.7.4-9**

The SCC AS sends a SIP re-INVITE request to update the remote leg that the media B is released.

**Table A.7.4-9: SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities)**

```

INVITE <sip:user3_public3@home3.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-00a0c91e6bf6> SIP/2.0
Via: SIP/2.0/UDP sccas1.homel.net;branch=z9hG4bKnas34r2.12
Max-Forwards:
Route: <sip:orig@scscfl.homel.net;lr>
P-Asserted-Identity: "Jake" <sip:user1_public1@homel.net>
Privacy: none
From: <sip:user1_public1@homel.net>;tag=171828
To: <sip:user3_public3@home3.net>;tag = 66666
Call-ID: cb03a0s09a2sdfgk490333
Cseq: 127 INVITE
Supported: 100rel, precondition
Contact: <sip: user1_public1@homel.net>; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c43t6br4>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
Accept: application/sdp
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 3333::aaa:bbb:ccc:ddd
s=-
t=0 0
m=audio 5555 RTP/AVP 97
c=IN IP6 3333::aaa:bbb:ccc:ddd
a=rtpmap:97 PCMU/90000
m=video 0 RTP/AVP 98
c=IN IP6 4444::aaa:bbb:ccc:ddd
a=rtpmap:98 MPV/90000

```

**10. SIP re-INVITE request (intermediate IM CN subsystem entities to remote UE)****11. SIP 200 (OK) response (remote UE to intermediate IM CN subsystem entities) - see example in table A.14.4-11**

The remote UE sends a SIP 200 (OK) with an SDP offer containing Media A and Media B information.

**Table A.7.4-11: SIP 200 (OK) (remote UE to intermediate IM CN subsystem entities)**

```

SIP/2.0 200 OK
Via:
To:
Call-ID:
Cseq: 127 INVITE
Supported: 100rel; precondition
Contact: <sip: user3_public3@home3.net>; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c67t6br4>
Allow:
Accept: application/sdp;
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 5555::aaa:bbb::ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb::ccc:ddd
t=0 0
m=audio 4444 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 0 RTP/AVP 98
a=rtpmap:98 MPV/9000

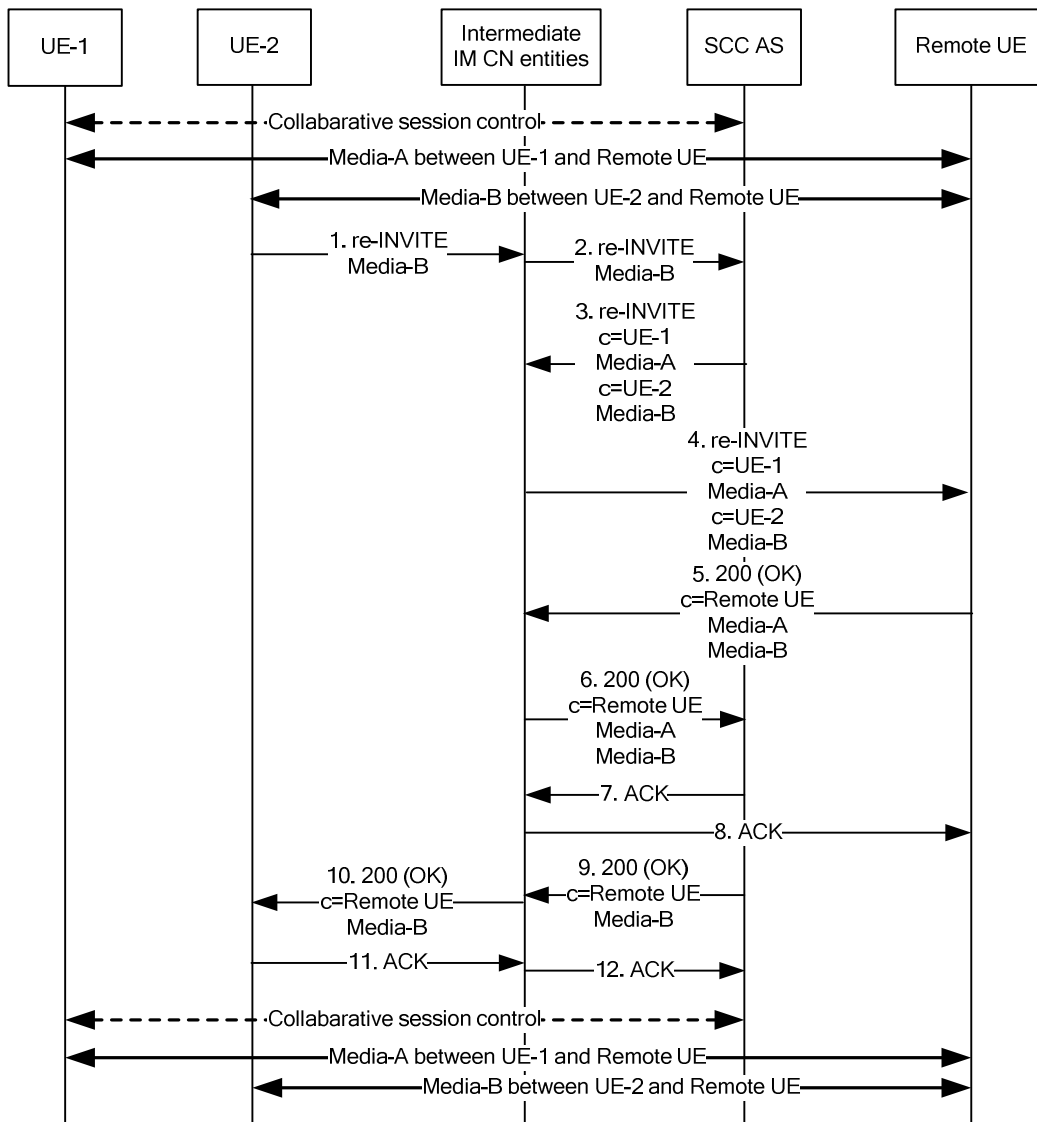
```

**12. SIP 200 (OK) response (intermediate IM CN subsystem entities to SCC AS)****13-14. SIP 200 (OK) response (SCC AS to UE-2 through IM CN subsystem entities)**

The SCC AS sends a 200 (OK) response.

**15-16. SIP ACK request (controllee UE to SCC AS)****17-18. SIP ACK request (SCC AS to remote UE)**

### A.7.5 Controllee UE modifies media on itself



**Figure A.7.5: Controllee UE modifies media on itself**

NOTE 1: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

It is assumed that UE-1 is the controller UE having collaborative session control. A user has a multimedia session on his device UE-1 with voice (Media A) and UE-2 with video (Media B) media flows. Subsequently, the UE-2 (Controllee UE) modifies the media B flow that is active on the remote UE.

**1. SIP re-INVITE request (UE-2 to intermediate IM CN subsystem entities)- see example in table A.7.5-1**

UE-2 sends a SIP re-INVITE request towards the remote UE containing Media B using SDP offer.

**Table A.7.5-1: SIP re-INVITE request (UE-2 to intermediate IM CN subsystem entities)**

```

INVITE <sip:userR_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6> SIP/2.0
Via:SIP/2.0/UDP [4444::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-Asserted-Identity: "John Doe2" <sip:user1_public2@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From:
To: Call-ID:
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Supported: 100rel, precondition
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_public@home1.net>; gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c67t6br4>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 4444::aaa:bbb:ccc:ddd
s=-
c=IN IP6 4444::aaa:bbb:ccc:ddd
t=0 0
m=video 4444 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

**2. SIP re-INVITE request (intermediate IM CN subsystem entities to SCC AS)**

The intermediate IM CN subsystem entities forward the SIP re-INVITE request to the SCC AS according to standard IMS procedure.

**3. SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities) - see example in table A.7.5-3**

The SCC AS sends a SIP re-INVITE request to the remote UE through the intermediate IM CN subsystem entities containing Media A and Media B information in SDP offer.

**Table A.7.5-3: SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities)**

```

INVITE <sip:userR_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6> SIP/2.0
Via: SIP/2.0/UDP sccas1.home1.net;branch=z9hG4bK240a48.12
Max-Forwards: 70
Route:
P-Asserted-Identity:
P-Access-Network-Info:
Privacy:
From:
To:
Call-ID:
Cseq:
Require:
Proxy-Require:
Supported:
Security-Verify:
Contact:
Allow:
Accept:
Content-Type:
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 3333::aaa:bbb:ccc:ddd
s=-
t=0 0
m=audio 2222 RTP/AVP 97
c=IN IP6 3333::aaa:bbb:ccc:ddd;rtpmap:97 MPV/90000
m=video 4444 RTP/AVP 98
c=IN IP6 4444::aaa:bbb:ccc:ddd
a=rtpmap:98 MPV/90000

```

**4. SIP re-INVITE request (intermedia IM CN subsystem entities to remote UE)****5. SIP 200 (OK) response (remote UE to intermediate IM CN subsystem entities) - see example in table A.14.5-5**

The remote EU sends a an SIP 200 (OK) response with SDP answer.

**Table A.7.5-5: SIP 200 (OK) response (remote UE to intermediate IM CN subsystem entities)**

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf2.visited2.net;branch=z9hG4bK240f26.3, SIP/2.0/UDP
    scscf2.home1.net;branch=z9hG4bK332d25.1, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332d25.2, SIP/2.0/UDP
    sccas1.home1.net;branch=z9hG4bK240a48.12
From:
To:
Call-ID:
Cseq: 127 INVITE
Supported: 100rel; precondition
Contact:
Allow:
Accept: application/sdp;
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=audio 4444 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 6666 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

**6. SIP 200 (OK) response (intermediate IM CN subsystem entities to SCC AS)****7-8. SIP ACK request (SCC AS to the remote UE through intermediate IM CN subsystem entities)**



The SCC AS sends a SIP ACK request to the remote UE through the intermediate IM CN subsystem entities.

**9. SIP 200 (OK) response (SCC AS to intermediate IM CN subsystem entities) - see example in table A.7.5-9**

The SCC AS sends a SIP 200 (OK) response containing Media B information and send it to UE-2 through the intermediate IM CN subsystem entities.

**Table A.7.5-9 SIP 200 (OK) response (SCC AS to intermediate IM CN subsystem entities)**

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP sccas1.home1.net;branch=z9hG4bK240f42.22,
From:
To:
Call-ID:
Cseq: 127 INVITE
Supported: 100rel; precondition
Contact:
Allow:
Accept: application/sdp;
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 5555::aaa:bbb:ccc:ddd
t=0 0
m=video 6666 RTP/AVP 98
a=rtpmap:98 MPV/90000
```

**10. SIP 200 (OK) response (intermediate IM CN subsystem entities to UE-2)**

**11-12. SIP ACK request (UE-2 to SCC AS through intermediate IM CN subsystem entities)**

UE-2 sends a SIP ACK request to the intermediate IM CN subsystem entities which is terminated by the SCC AS.

## A.7.6 Remote UE adds new media on controllee UE

It is assumed that UE-1 is the controller UE having collaborative session control. A user has a multimedia session on his device UE-1 with voice (Media A) and video (Media B) media flows. Subsequently, the remote UE adds the media B flow. In this scenario it is assumed that the controller UE, UE-1 automatically initiates the addition of the new media on UE-2 (Controllee) without first alerting the user and sends a SIP REFER request prior to sending back a SIP 200 (OK) response to the SIP re-INVITE request.

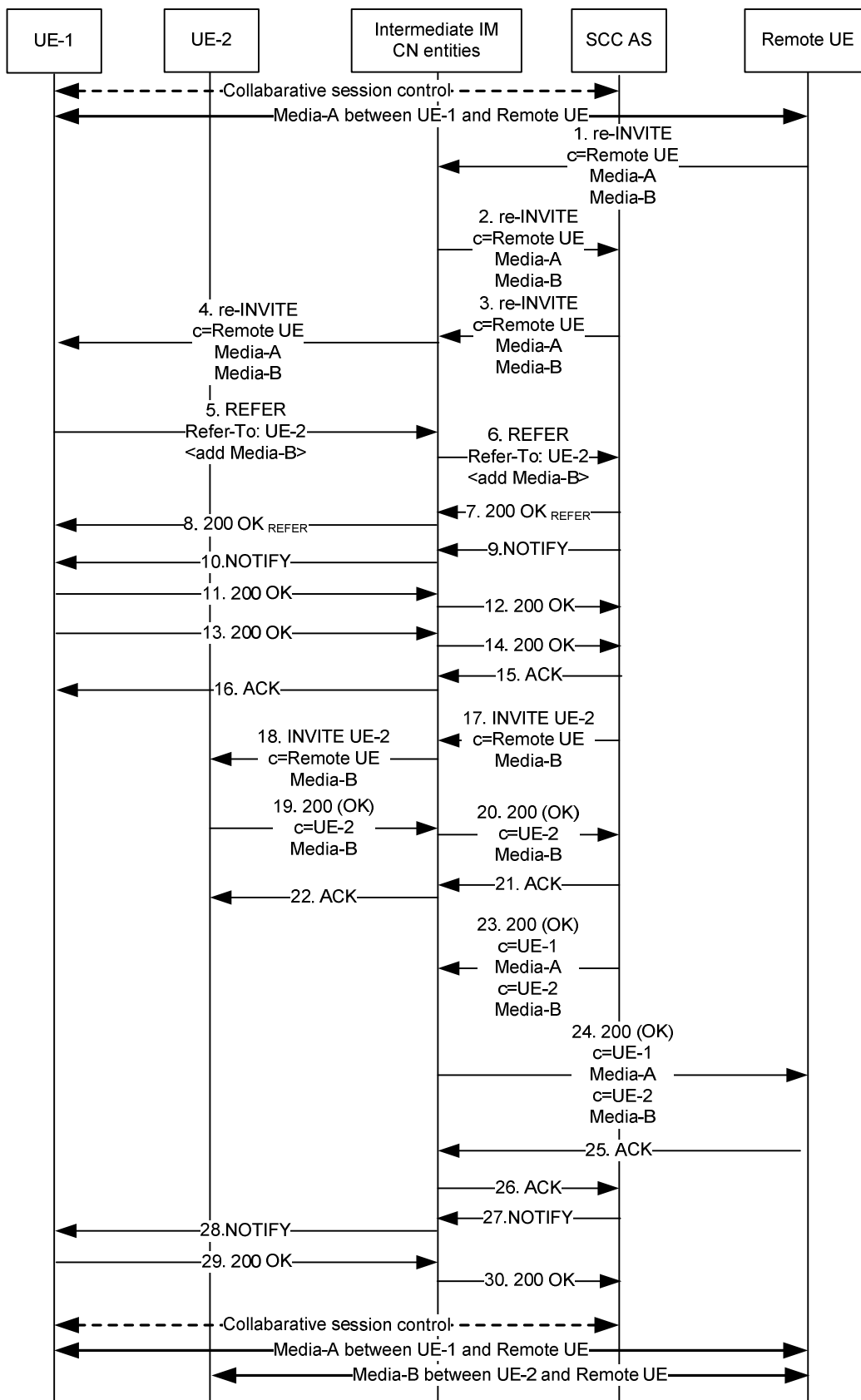


Figure A.7.6: Remote UE add new media on Controllee UE

NOTE 1: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

1. SIP re-INVITE request (remote UE to intermediate IM CN subsystem entities) - see example in table A.14.6-1

The remote UE sends a SIP re-INVITE request towards the controller UE (UE-1) indicating media B is to be added in SDP offer.

**Table A.7.6-1: SIP re-INVITE request (remote UE to intermediate IM CN subsystem entities)**

```

INVITE <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6> SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf2.visited2.net:7531;lr;comp=sigcomp>, <sip:orig@scscf2.home1.net;lr>
P-Asserted-Identity: "David Fan" <sip:user3_public3@home3.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From:
To:
Call-ID:
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Supported: 100rel, precondition
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:user3_public3@home3.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c67t6br4>
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=audio 6666 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 4444 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

#### 2-4. SIP re-INVITE request

Intermediate IM CN subsystem entities forward the SIP re-INVITE request to UE-1 via the SCC AS according to standard IMS procedure.

#### 5-6. SIP REFER request (UE-1 to SCC AS through intermediate IM CN subsystem entities) - see example in table A.7.6-5

The controller UE determines to add the new media (Media B) on the controllee UE. The controller UE, UE-1 sends a SIP REFER request to the SCC AS containing a Refer-To header field containing the GRUU of controllee UE, UE-2 and a body parameter containing an m line for audio set to 0 and an m line for video with the port number set to the port number of the video media line from the SDP offer in the SIP re-INVITE request from the remote UE. The SIP REFER request also includes a Target-dialog header field containing the details of the dialog for the existing session between the controller UE, UE-1 and the remote UE.

**Table A.7.6-5 SIP REFER request (UE-1 to SCC AS)**

```

REFER sip:interUEtransfer@sccas1.home1.net SIP/2.0
Via:
To: sip:interUEtransfer@sccas1.home1.net
From: sip:user1_public1@home1.net;tag=34719
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 93809824 REFER
Max-Forwards: 70
P-Preferred-Identity:
Refer-To: <sip:user1_public2@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91e6bf6?body=m%3Daudio%20%20RTP%2FAVP%2097%0Dm%3Dvideo%204444%20RTP%2FAVP%2098>
Require: target-dialog
Target-dialog: cb03a0s09a2sdfglkj490333;remote-tag=13579;local-tag=24680
Referred-By: sip:user1_public1@home1.net
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91e6bf6>;+g.3gpp.iut-controller
Allow:
Accept:message/sipfrag
Content-Length:0

```

**7-8. SIP 200 (OK) response**

The SCC-AS sends a SIP 200 (OK) response to the controller UE-1 as response to the SIP REFER request.

**9-10. SIP NOTIFY request (SCC AS to UE-1 through intermediate IM CN subsystem entities)-see example in table A.7.3.2-5**

The SCC AS sends a SIP NOTIFY request to UE-1 to notify implicit subscription to the SIP REFER request results.

**Table A.7.3.2-5 SIP NOTIFY request (SCC-AS to UE-1)**

```

NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public1@home1.net;tag=34719
From: sip:interUEtransfer@sccas1.home1.net;tag=2255
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: <sip:user3_public3@home3.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c67t6br4>
Allow:
Event: refer
Subscription-State: active;expires=3600
Content-Type: message/sipfrag;version=2.0
Content-Length: (...)
SIP/2.0 100 Trying

```

**11-12. SIP 200 (OK) response (UE-1 to SCC-AS through intermediate IM CN subsystem entities)**

The controller UE, UE-1, acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to SCC AS.

**13-14. SIP 200 (OK) response (UE-1 to SCC-AS through intermediate IM CN subsystem entities)-see example in table A.7.6-13**

The controller UE responds to the SIP re-INVITE request in step 4.

**Table A.7.6-13: SIP 200 (OK) response (SCC AS to intermediate IM CN subsystem entities)**

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcsfc1.visited1.net;branch=z9hG4bK240f34.3, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    sccas1.home1.net;branch=z9hG4bKnas34r4.12
From:
To:
Call-ID:
Cseq: 127 INVITE
Supported: 100rel; precondition
Contact:
Allow:
Accept: application/sdp;
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 3333::aaa:bbb:ccc:ddd
s=-
c=IN IP6 3333::ccc:ddd:aaa:bbb
t=0 0
m=audio 8888 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 0 RTP/AVP 98

```

**15-16. SIP ACK (SCC AS to UE-1 through intermediate IM CN subsystem entities)****17. SIP INVITE request (SCC AS to intermediate IM CN subsystem entities)-see example in table A.7.6-15**

NOTE 2: This SIP INVITE request can be sent as soon as the SIP REFER request is received.

The SCC AS sends a SIP INVITE request towards UE-2 through the intermediate IM CN subsystem entities indicating Media B information in SDP offer.

**Table A.7.6-17: SIP INVITE request (SCC AS to intermediate IM CN subsystem entities)**

```

INVITE sip:user1_public2@home1.net;gr=urn:uuid:2ad8920e-48a5-4a74-8d99-ad76cc7fc74 SIP/2.0
Via: SIP/2.0/UDP sccas1.home1.net;branch=z9hG4bKnas34r2.12
Max-Forwards: 70
Route: <sip:term@scscf1.home1.net;lr>, <sip:pcsfc1.visited1.net:7538;lr;comp=sigcomp>
P-Asserted-Identity: "John Doe" <sip:user3_public3@home3.net>
Privacy: none
From: <sip:user3_public3@home3.net>;tag=171828
To: <sip:user1_public2@home1.net>
Call-ID: cb03a0s09a2sdfgklkj490333
Cseq: 127 INVITE
Supported: 100rel, precondition
Referred-By: sip:user1_public1@home1.net
Contact: <sip:user3_public3@home3.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c67t6br4>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE, SUBSCRIBE, NOTIFY
Accept: application/sdp
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 5555::aaa:bbb:ccc:ddd
s=-
c=IN IP6 4444::bbb:aaa:ccc:ddd
t=0 0
m=audio 0 RTP/AVP 97
m=video 4444 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

**18. SIP INVITE request (intermediate IM CN subsystem entities to UE-2)****19. SIP 200 (OK) response (UE-2 to intermediate IM CN subsystem entities) - see example in table A.7.6-19**

UE-2 responds with a SIP 200 (OK) response containing the SDP answer.

**Table A.7.6-19: SIP 200 (OK) response (UE-2 to intermediate IM CN subsystem entities)**

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcscf1.visited1.net;branch=z9hG4bK240f34.3, SIP/2.0/UDP
    scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
    sccas1.home1.net;branch=z9hG4bKnas34r2.12
From:
To: <sip:user1_public2@home1.net>;tag=237674
Call-ID:
Cseq: 127 INVITE
Supported: 100rel; precondition
Contact: <sip:user1_public2@home1.net;gr=urn:uuid:2ad8920e-48a5-4a74-8d99-
    ad76cc7fc74>;+g.3gpp.icsi-ref="urn%3Aurn-7%3gpp-service.ims.icsi.mmmtel"
Allow:
Accept: application/sdp;
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 4444::aaa:bbb:ccc:ddd
s=-
c=IN IP6 4444::aaa:bbb:ccc:ddd
t=0 0
m=audio 0 RTP/AVP 97
m=video 6666 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

**20. SIP 200 (OK) response (intermediate IM CN subsystem entities to SCC AS)****21-22. SIP ACK (SCC AS to UE-2 through intermediate IM CN subsystem entities)****23. SIP 200 (OK) response (SCC AS to intermediate IM CN subsystem entities) - see example in table A.7.6-23**

In response to the SIP re-INVITE from the remote UE, the SCC AS sends a SIP 200 (OK) response containing the SDP answer towards the remote UE through IM CN subsystem entities, which includes Media A and Media B information.

**Table A.7.6-23: SIP 200 (OK) response (SCC AS to intermediate IM CN subsystem entities)**

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG6bKnas34r4, SIP/2.0/UDP
    scscf2.visited2.net;branch=34qtrada3333.22, SIP/2.0/UDP
    pcscf2.visited2.net;branch=34qtrada5454.12, SIP/2.0/UDP
    [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
Cseq: 127 INVITE
Supported: 100rel; precondition
Contact:
Allow:
Accept: application/sdp;
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 3333::aaa:bbb:ccc:ddd
s=-
t=0 0
m=audio 8888 RTP/AVP 97
c=IN IP6 3333::ccc:ddd:aaa:bbb
a=rtpmap:97 PCMU/8000
m=video 6666 RTP/AVP 98
c=IN IP6 4444::bbb:aaa:ccc:ddd
a=rtpmap:98 MPV/90000

```

**24. SIP 200 (OK) response (intermediate IM CN subsystem entities to remote UE)****25-26. SIP ACK (remote UE to SCC AS through intermediate IM CN subsystem entities)**

The remote UE sends a SIP ACK request to the intermediate IM CN subsystem entities which terminated by the SCC AS.

#### 27-28. SIP NOTIFY request (from SCC AS to controller UE, UE-1)

The SCC AS sends a SIP NOTIFY request to the controller UE, UE-1 to inform about the success status if the inter-UE transfer.

**Table A.7.6-27: SIP NOTIFY request (SCC AS to UE-1)**

```
NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
To: sip:user1_public1@home1.net;tag=34719
From: sip:interUEtransfer@sccas1.home1.net;tag=2255
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: <sip:user3_public3@home3.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c67t6br4>
Allow:
Event: refer
Subscription-State:terminated;reason=noresource
Content-Type: message/sipfrag;version=2.0
Content-Length: (...)

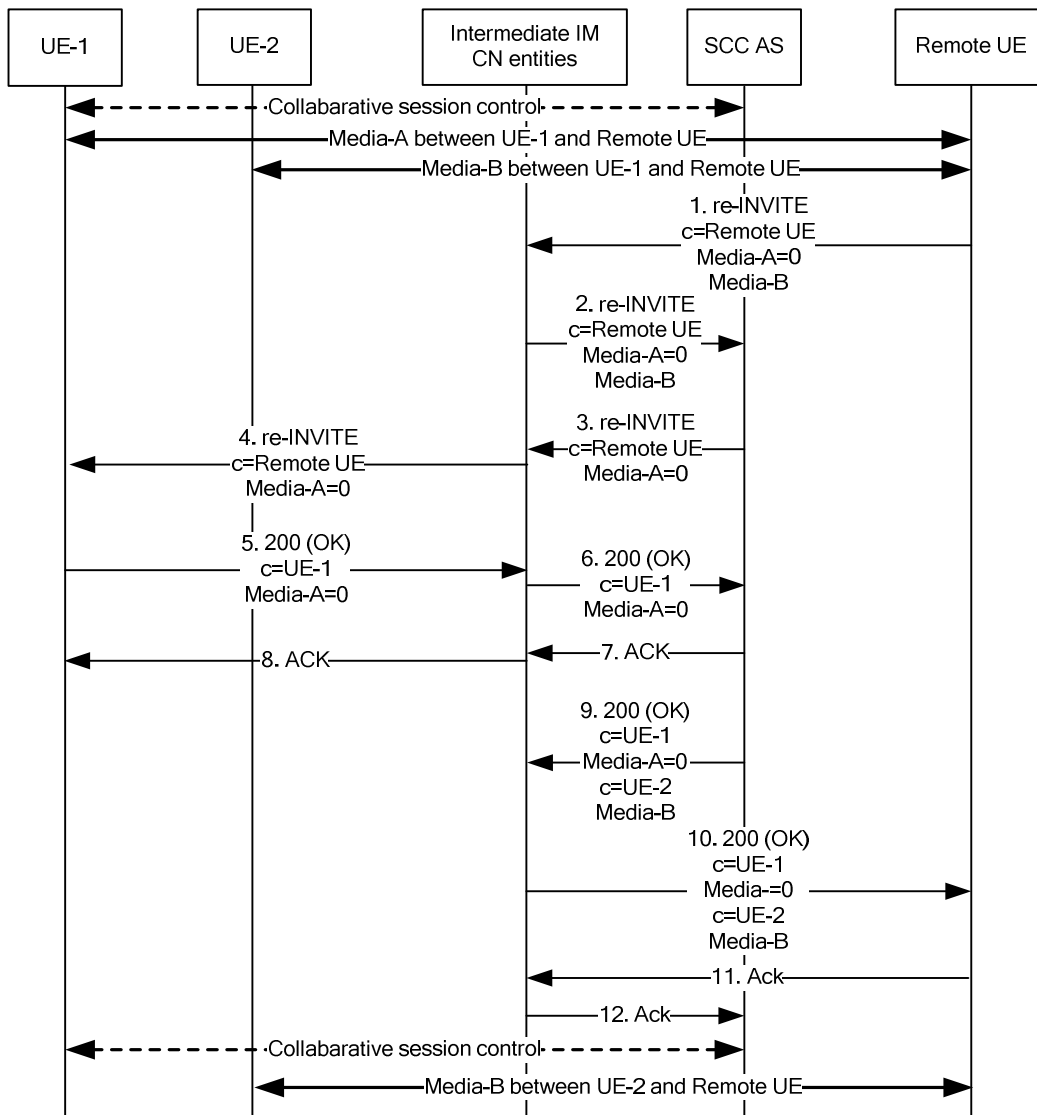
SIP/2.0 200 OK
Content-Type: application/sdp

v=0
s=-
m=audio 0 RTP/AVP 97
m=video 6666 RTP/AVP 98
```

#### 29-30. SIP 200 (OK) response (from controller UE to SCC AS)

The controller UE acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS.

### A.7.7 Remote UE releases media on the controller UE



**Figure A.7.7: Remote UE releases media on the controller UE**

NOTE 1: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

**1. SIP re-INVITE request (Remote Party to intermediate IM CN subsystem entities) - see example in table A.14.7-1**

The remote UE sends a SIP re-INVITE request towards the controller UE (UE-1) indicating Media A is to be removed using SDP offer. If Media B is to be removed, the SIP re-INVITE request will send to controllee UE (UE-2).



**Table A.7.7-1: SIP re-INVITE request (Remote UE to intermediate IM CN subsystem entities)**

```

INVITE <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6> SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: <sip:pcscf2.visited2.net:7531;lr;comp=sigcomp>, <sip:orig@scscf2.home1.net;lr>
P-Asserted-Identity: "David Fan" <sip:userR_public1@home1.net>
P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-cell-id-3gpp=234151D0FCE11
Privacy: none
From:
To:
Call-ID:
Cseq: 127 INVITE
Require: sec-agree
Proxy-Require: sec-agree
Supported: 100rel, precondition
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_public@home1.net>; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c67t6br4>
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=audio 0 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 4444 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

**2. SIP re-INVITE request (intermediate IM CN subsystem entities to SCC AS)**

The intermediate IM CN subsystem entities forward the re-INVITE request to the SCC AS according to standard IMS procedures.

**3. SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities) - see example in table A.7.7-3**

The media B is not removed, but the SCC AS set the port of the media B to 0, and forwards it towards intermediate IM CN subsystem entities.

**Table A.7.7-3: SIP INVITE request (SCC AS to intermediate IM CN subsystem entities)**

```

INVITE <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6> SIP/2.0
Via: SIP/2.0/UDP sccas1.home1.net;branch=z9hG4bKnas34r4.12
Max-Forwards: 70
Route: <sip:term@scscf2.home1.net;lr>
P-Asserted-Identity:
P-Access-Network-Info:
Privacy:
From:
To:
Call-ID:
Cseq:
Supported:
Require:
Proxy-Require:
Security-Verify:
Contact:
Allow:
Accept:
Content-Type:
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=audio 0 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 0 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

**4. SIP re-INVITE request (intermediate IM CN subsystem entities to UE-1)**

The intermediate IM CN subsystem entities forward the SIP re-INVITE request to the controller UE according to standard IMS procedure.

**5. SIP 200 (OK) response (UE-1 to intermediate IM CN subsystem entities) - see example in table A.7.7-5**

UE-1 sends a SIP 200 (OK) response with an SDP answer.

**Table A.7.7-5: SIP 200 (OK) response (UE-1 to intermediate IM CN subsystem entities)**

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP pcsf1.visited1.net;branch=z9hG4bK240f34.3, SIP/2.0/UDP
scscf1.home1.net;branch=z9hG4bK332b23.1, SIP/2.0/UDP
sccas1.home1.net;branch=z9hG4bKnas34r4.12
From:
To:
Call-ID:
Cseq: 127 INVITE
Supported: 100rel; precondition
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91e6bf6>;+g.3gpp.iut-controller
Allow:
Accept: application/sdp;
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 3333::eee:fff:aaa:bbb
s=-
c=IN IP6 3333::eee:fff:aaa:bbb
t=0 0
m=audio 0 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 0 RTP/AVP 98
a=rtpmap:98 MPV/90000

```

**6. SIP 200 (OK) response (intermediate IM CN subsystem entities to SCC AS)**

**7-8. SIP ACK (SCC AS to UE-1 through intermediate IM CN subsystem entities)**

The SCC AS sends a SIP ACK request to the controller UE through the intermediate IM CN subsystem entities.

**9. SIP 200 (OK) response (SCC AS to intermediate IM CN subsystem entities) – see example in table A.7.7-9**

The SCC AS sends a SIP 200 (OK) response with an SDP answer indicating Media A is removed to the intermediate IM CN subsystem entities

**Table A.7.7-9: SIP 200 (OK) response (SCC AS to intermediate IM CN subsystem entities)**

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP scscf1.home1.net;branch=z9hG6bKnas34r4, SIP/2.0/UDP
scsf2.visited2.net;branch=3q5qefsd62233.22, SIP/2.0/UDP
pcscf2.visited2.net;branch=3q5qefsd62245.12, SIP/2.0/UDP
[5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7
From:
To:
Call-ID:
Cseq: 127 INVITE
Supported: 100rel; precondition
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91e6bf6>;+g.3gpp.iut-controller
Allow:
Accept: application/sdp;
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933300 2987933300 IN IP6 3333::aaa:bbb:ccc:ddd
s=-
c=IN IP6 3333::aaa:bbb:ccc:ddd
t=0 0
m=audio 0 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 6666 RTP/AVP 98
c=IN IP6 4444::aaa:bbb:ccc:ddd
a=rtpmap:98 MPV/90000
```

**10. SIP 200 (OK) response (intermediate IM CN subsystem entities to remote UE)****11-12. SIP ACK (remote UE to SCC AS through intermediate IM CN subsystem entities)**

The remote UE sends a SIP ACK request to UE-1 through the intermediate IM CN subsystem entities which is terminated by the SCC AS.

---

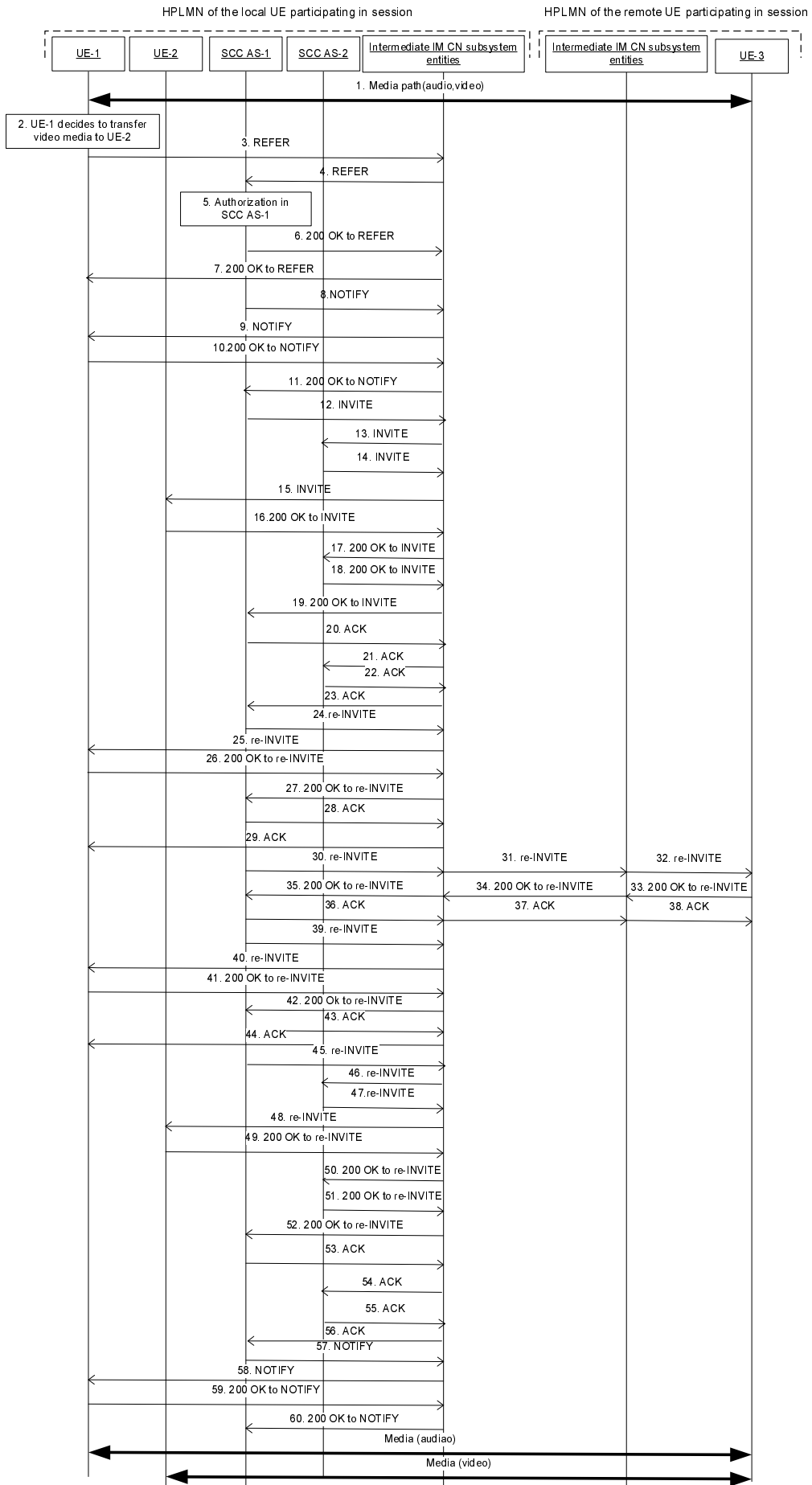
## A.8 Signalling flows for collaborative session of participants of different subscriptions

### A.8.1 Introduction

This subclause demonstrates the flows for collaborative sessions of participants of different subscriptions.

### A.8.2 Signalling flow for controller UE initiated media transfer from controller UE to controllee UE belonging to different subscriptions under the same operator

In the example flow of figure A.8.2-1, UE-1 has an ongoing multimedia session with UE-3 anchored at SCC AS-1. UE-1 and UE-2 belong to different subscribers. UE-1 decides to transfer video media to UE-2 and keep the collaborative session control.



**Figure A.8.2-1: Signalling flow for controller UE initiated media transfer from controller UE to controllee UE belonging to different subscriptions under the same operator**

NOTE: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

**1. UE-1 is in session with UE-3**

There is a multimedia session comprising audio and video media between UE-1 and remote UE-3 anchored at SCC AS-1.

**2. UE-1 decides to transfer the video portion of the session from UE-1 to UE-2 and keep the collaborative session control.**

**3-4. SIP REFER request (UE-1 to SCC AS-1) - see example in table A.8.2-3**

UE-1 sends a SIP REFER request to SCC AS-1 to request the media transfer.

**Table A.8.2-3: SIP REFER request (UE-1 to SCC AS-1)**

```
REFER sip:interUEtransfer@example.net SIP/2.0
Refer-To: <sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6?body=
m%3Daudio%20%20RTP%2FAVP%97%0Dm%3Dvideo%203002%20RTP%2FAVP%2098%2099>
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7dfdsdq
Max-Forwards: 70
P-Preferred-Identity: <sip:user1@home1.net>
From: <sip:user1@home1.net>;tag=171828
To: <sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222>
Call-ID: Asdasd23123366
Cseq: 4897924 REFER
Contact: <sip:user1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>
Referred-by: sip:user1@home1.net
Accept-Contact: * ;+g.3gpp.iut-focus;explicit;require
Accept: application/sdp, message/sipfrag
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Length: 0
```

**5. When SCC AS-1 receives the SIP REFER request, SCC AS-1 authorizes the request.**

**6-7. SIP 200 (OK) response to SIP REFER request (SCC AS-1 to UE-1).**

**8-9. SIP NOTIFY request (SCC AS-1 to UE-1)**

SCC AS-1 informs UE-1 about the implicit subscription to the SIP REFER request results.

**10-11. SIP 200 (OK) response to SIP NOTIFY request (UE-1 to SCC AS-1)**

UE-1 confirms the SIP NOTIFY request by sending a SIP 200 (OK) response to the SIP NOTIFY request.

**12-15. SIP INVITE request (SCC AS-1 to UE-2) - see example in table A.8.2-12**

SCC AS-1 sends the SIP INVITE request towards UE-2 to establish a session based on the information provided in the SIP REFER request.

**Table A.8.2-12: SIP INVITE request (SCC AS-1 to UE-2)**

```

INVITE sip:user2@home2.net SIP/2.0
Via: SIP/2.0/UDP
Max-Forwards:
From: <sip:interUEtransfer@example.net>;tag=38789
To: <sip:user2@home2.net; >
Call-ID: duie4hr3896
Cseq: 41 INVITE
Contact: <sip:sccas1.home1.example.net>;+g.3gpp.iut-focus
Referred-By: sip:user1@home1.net
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
c=IN IP4 123.112.67.87
t=0 0
m=audio 0 RTP/AVP 97
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**16-19. SIP 200 (OK) response to SIP INVITE request (UE-2 to SCC AS-1)**

UE-2 acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to SCC AS-1.

**20-23. SIP ACK request (SCC AS-1 to UE-2)**

SCC AS-1 sends a SIP ACK request to UE-2.

**24-25. SIP re-INVITE request (SCC AS-1 to UE-1)**

SCC AS-1 sends a SIP re-INVITE request to UE-1 to hold the media to be transferred.

**26-27. SIP 200 (OK) response (UE-1 to SCC AS-1)**

UE-1 acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to SCC AS-1.

**28-29. SIP ACK request (SCC AS-1 to UE-1)**

SCC AS sends a SIP ACK request to UE-1.

**30-32. SIP re-INVITE request (SCC AS-1 to UE-3)- see example in table A.8.2-30**

SCC AS-1 sends a SIP re-INVITE request to the remote UE to update the video media.

**Table A.8.2-30: SIP INVITE request (SCC AS-1 to UE-3)**

```

INVITE sip:user3@home3.net SIP/2.0
Via:
To: sip:user3_public3@home3.net;tag = 66666
From: sip:interUEtransfer@example.net; tag=33333
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:user1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
t=0 0
m=audio 1300 RTP/AVP 96 97
c=IN IP4 123.45.67.89
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
c=IN IP4 145.23.77.88
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**33-35. SIP 200 (OK) response to re-INVITE request (UE-3 to SCC AS-1)**

After successful media update, UE-3 sends a SIP 200 (OK) response towards SCC AS-1.

**36-38. SIP ACK request (SCC AS-1 to UE-3)**

SCC AS-1 sends a SIP ACK request to remote UE-3.

**39-40. SIP re-INVITE request (SCC AS-1 to UE-1)**

The SCC AS sends a SIP re-INVITE request to UE-1 to update the media in UE-1.

**41-42. SIP 200 (OK) response (UE-1 to SCC AS-1)**

UE-1 acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to SCC AS-1.

**43-44. SIP ACK request (SCC AS-1 to UE-1)**

The SCC AS sends a SIP ACK request to UE-1.

**45-48. SIP re-INVITE request (SCC AS-1 to UE-2)**

SCC AS-1 sends a SIP re-INVITE request to UE-2 to activate the video media components.

**49-52. SIP 200 (OK) response (UE-2 to SCC AS-1)**

UE-2 acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCC AS.

**53-56. SIP ACK request (SCC AS-1 to UE-2)**

The SCC AS sends a SIP ACK request to UE-2.

**57-58. SIP NOTIFY request (SCC AS-1 to UE-1)**

SCC AS-1 informs the UE-1 that the action triggered by the SIP REFER request was successfully completed.

**59-60. SIP 200 (OK) response to SIP NOTIFY request (UE-1 to SCC AS-1)**

UE-1 confirms the SIP NOTIFY request by sending a SIP 200 (OK) response to the SIP NOTIFY request.

---

## A.9 Signalling flows for for establishment of a collaborative session during session setup

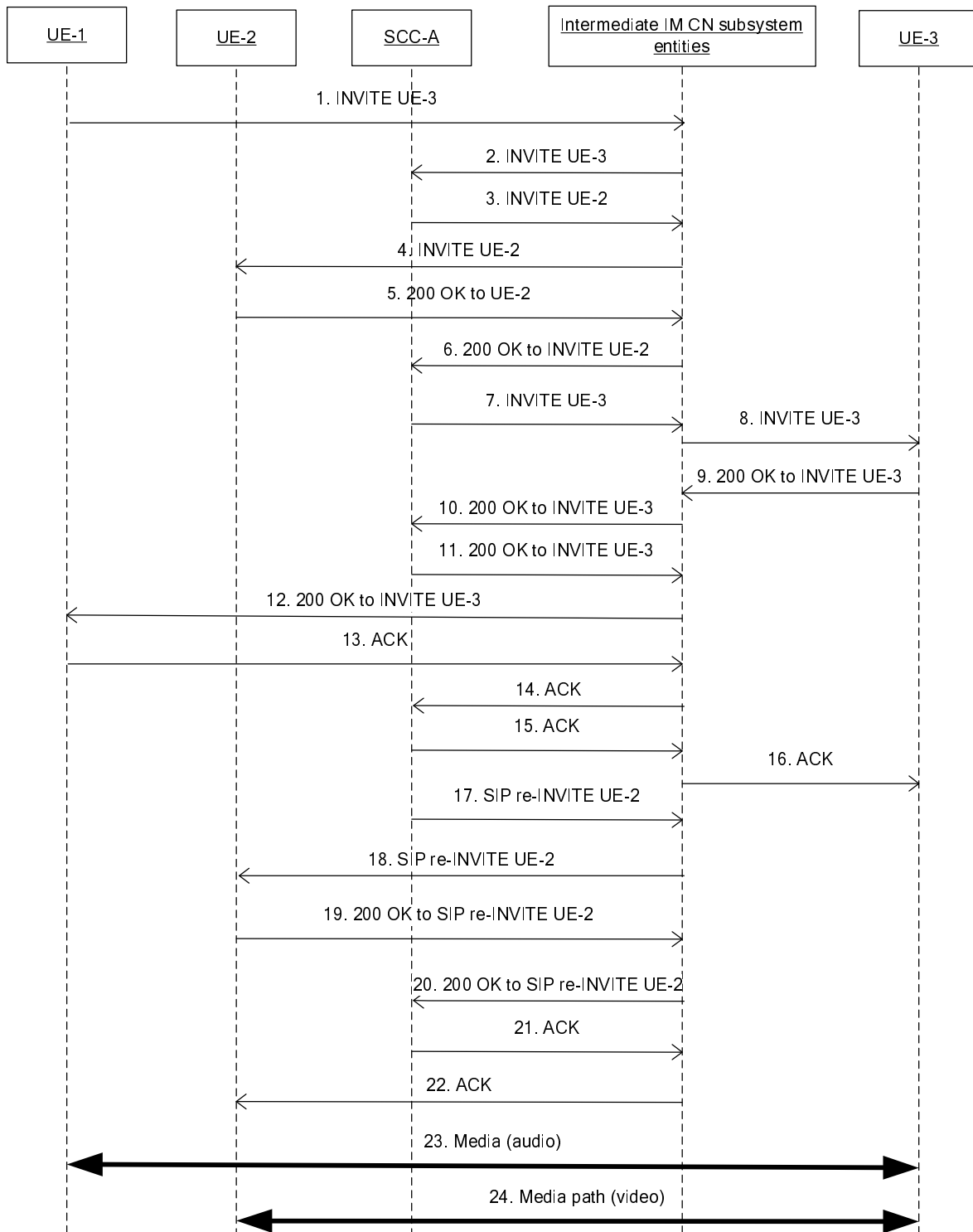
### A.9.1 Introduction

The signalling flows in this subclause demonstrate how a UE-1 can establish a Collaborative Session during originating and terminating session setup.

### A.9.2 Collaborative session establishment upon originating session setup

In the example flow at the figure A.9.2-1, UE-1 wants to establish a collaborative session without the pre-requisite of having an IMS session established. The UE-1 wants to setup a collaborative session with audio media flow in UE-1 and video media flow in UE-2, and wants to control the collaborative session through UE-1.





**Figure A.9.2-1: Signalling flow for establishment of collaborative session upon originating IMS session**

NOTE: For clarity, the SIP 100 (Trying) messages are not shown in the signalling flow.

**1-2. SIP INVITE request (UE-1 to SCC AS) - see example in table A.9.2-1**

The UE-1 sends SIP INVITE request to SCC AS to setup the collaborative session.

**Table A.9.2-1: SIP INVITE request (UE-1 to intermediate IM CN subsystem entities)**

```

INVITE SIP: user3@example1.net; SIP/2.0
Via: SIP/2.0/UDP 192.0.2.5;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: sip:pcscf1.home1.net:7531;lr;comp=sigcomp>, <sip:orig@scscf1.home1.net;lr>
P-Preferred-Identity: <sip:uesr1@example1.net>
P-Access-Network-Info:
Privacy: none
From: <sip:user1@example1.net>; tag=171828
To: <sip:user3@example1.net>
Call-ID: cb03a0s09a2sdfglkj490237
Cseq: 127 INVITE
Supported: 100rel; precondition, gruu, 199
Require: sec-agree, replaces
Proxy-Require: sec-agree
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3gpp-service.ims.icsi.mmtel"
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi=87654321; port1=7531
Contact:<sip:user1@example1.net;gr= urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6>;
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE
Accept: application/sdp; application/3gpp-ims+xml
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP4 192.0.2.5
s=
t=0 0
c=IN IP4 192.0.2.5
m=audio 49170 RTP/AVP 0 8 3
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:96 telephone-event
a=maxptime:20
m=video 9 RTP/AVP 98
c=IN IP4 0.0.0.0
a=3gpp.iut.controllee sip:user2@example2.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**SDP:** The first media stream (audio) will be terminated by UE-1 of which the IP address is indicated in the c-line in the SDP.

The port number of the remote side, i.e. UE-3 for the video media is currently not known to UE-1, therefore the port number for the video media stream is set to the discard port number "9".

### 3-4. SIP INVITE request (SCC AS to UE-2) - see example in table A.9.2-3

Upon receiving the SIP INVITE request, the SCC AS sends a SIP INVITE request to UE-2 to establish the media between UE-2 and the remote UE-3.

**Table A.9.2-3: SIP INVITE request (SCC AS to intermediate IM CN subsystem entities)**

```

INVITE sip:user2@example1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6; SIP/2.0
Via:
Record-Route: sip:sccas1.home1.example.net
To: <sip:user2@example1.net>
From: sip:user1@example1.net;tag=acegi
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity: sip:user1@example1.net
Require:
Contact: <sip:user1@example1.net;gr= urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6>;
Allow:
Content-Type: application/sdp
Content-Length: (...)

```

```

v=0
o=- 2987933615 2987933615 IN IP4 192.0.2.5
s=
t=0 0
c=IN IP4 192.0.2.5
a=creq:ccap-v0
m=audio 0 RTP/AVP 0 8 3
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:96 telephone-event
a=maxptime:20
m=video 9 RTP/AVP 98
C=IN IP4 0.0.0.0
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

#### 5-6. SIP 200(OK) response to SIP INVITE request (UE-2 to SCC AS) - see example in table A.9.2-5

**Table A.9.2-5: SIP 200 (OK) response (UE-2 to intermediate IM CN subsystem entities)**

```

SIP/2.0 200 OK
Via:
To: <sip:user2@example1.net>;tag=xyzwv
From: <sip:user1@example1.net>; tag=171828
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: sip:user2@example1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
Allow: INVITE, PRACK, UPDATE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 192.0.2.5
s=-
t=0 0
m=audio 0 RTP/AVP 0 8 3
m=video 1300 RTP/AVP 98
a=inactive
c=IN IP4 145.23.77.88
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0

```

**SDP:** The connection information now indicates the IP address of UE-2.

#### 7-8. SIP INVITE request (SCC AS to UE-3)

The SCC AS sends the SIP INVITE request towards the remote UE-3 containing the SDP information of UE-1 and UE-2.

#### 9-12. SIP 200 (OK) response to SIP INVITE request(UE-3 to UE-1)

UE-3 acknowledges the SIP INVITE request by sending SIP 200 (OK) response with the SDP answer to UE-1.

#### 13-16. SIP ACK request (UE-1 to UE-3)

UE-1 sends SIP ACK request to the remote UE.

#### 17-18. SIP re-INVITE request (SCC AS to UE-2)

SCC AS-2 sends SIP re-INVITE request to UE-2 to update the media in UE-2.

#### 19-20. SIP 200 (OK) response to SIP re-INVITE request (UE-2 to SCC AS)

The UE-2 confirms the SIP re-INVITE request by sending SIP 200 (OK) response to SCC AS.

#### **21-22. SIP ACK request (SCC AS to UE-2)**

SCC AS sends SIP ACK request to the remote UE.

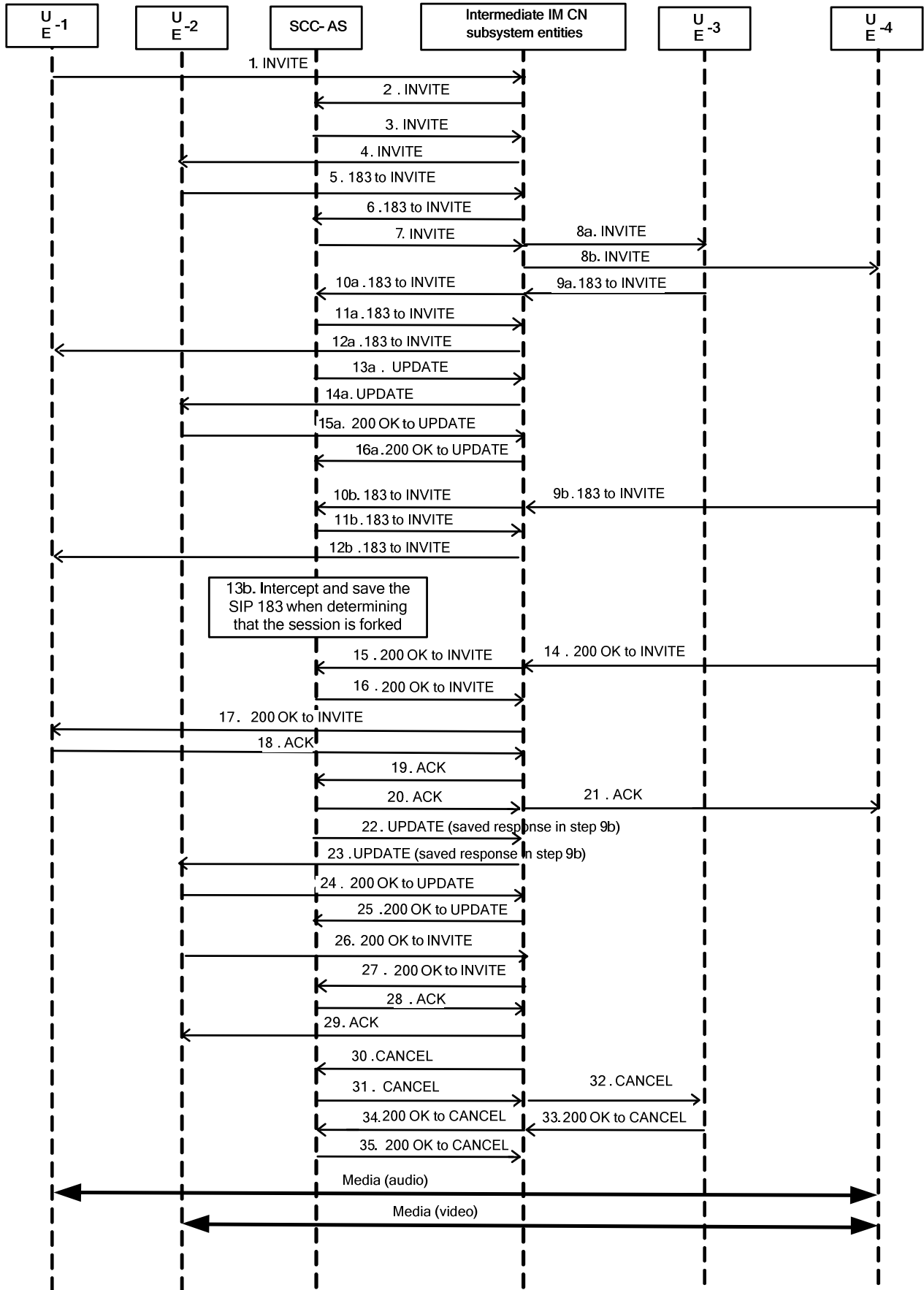
#### **23-24. Media path:**

The audio media is between controller UE-1 and remote UE-3, and the video media is established between controllee UE-2 and the remote UE. The collaborative session control is in the controller UE-1.

### **A.9.3 Collaborative session establishment upon originating session setup with forked responses**

In the information flow at the figure A.9.2a-1, UE-1 wants to establish a collaborative session without the pre-requisite of having an IMS session established. The UE-1 wants to setup a collaborative session with audio media flow in UE-1 and video media flow in UE-2, and wants to control the collaborative session through UE-1.

The SIP INVITE request is forked to the remote party. This flow assumes that the second Remote UE accepts the call.



### Figure A.9.3-1: Signalling flow for establishment of collaborative session upon originating IMS session with forked response

NOTE: For clarity, the SIP 100 (Trying), SIP PRACK requests to 183 (Session Progress) responses and SIP 200 (OK) responses to SIP PRACK requests are not shown in the signalling flow.

#### 1-2. SIP INVITE request (UE-1 to SCC AS) - see example in table A.9.3-1

The UE-1 sends SIP INVITE request to SCC AS to setup the collaborative session.

**Table A.9.3-1: SIP INVITE request (UE-1 to intermediate IM CN subsystem entities)**

```

INVITE SIP: user3@example1.net; SIP/2.0
Via: SIP/2.0/UDP 192.0.2.5;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: sip:pcscf1.homel.net:7531;lr;comp=sigcomp, <sip:orig@scscf1.homel.net;lr>
P-Preferred-Identity: <sip:uesrl@example1.net>
P-Access-Network-Info:
Privacy: none
From: <sip:user1@example1.net>; tag=171828
To: <sip:user3@example1.net>
Call-ID: cb03a0s09a2sdfgk490237
Cseq: 127 INVITE
Supported: 100rel; precondition, gruu, 199
Require: sec-agree, replaces
Proxy-Require: sec-agree
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3gpp-service.ims.icsi.mmtel"
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi=87654321; port1=7531
Contact:<sip:user1@example1.net;gr= urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6>;
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE
Accept: application/sdp; application/3gpp-ims+xml
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP4 192.0.2.5
s=
t=0 0
c=IN IP4 192.0.2.5
a=creq:ccap-v0
m=audio 49170 RTP/AVP 0 8 3
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:96 telephone-event
a=maxptime:20
m=video 9 RTP/AVP 98
c=IN IP4 0.0.0.0
a=3gpp.iut.controllee SIPURI sip:user2@example2.net; gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**SDP:** The first media stream (audio) will be terminated by UE-1 of which the IP address is indicated in the c-line in the SDP header. The second media stream (video) will be terminated by UE-2.

The port number of the UE-2 for the video media is currently not known to UE-1, therefore the port number for the video media stream is set to the discard port number "9".

#### 3-4. SIP INVITE request (SCC AS to UE-2) - see example in table A.9.2-3

Upon receiving the SIP INVITE request, the SCC AS sends a SIP INVITE request to UE-2 to establish the media between UE-2 and the remote UE-3.

**Table A.9.3-3: SIP INVITE request (SCC AS to intermediate IM CN subsystem entities)**

```

INVITE sip:uesr2@example1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6; SIP/2.0
Via:
Record-Route: sip:sccas1.homel.example.net
To: <sip:user2@example1.net>
From: sip:user1@example1.net;tag=acegi
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity: sip:user1@example1.net
Require:
Contact: <sip:user1@example1.net;gr= urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6>;
Allow:
Content-Type: application/sdp
Content-Length:(...)

v=0
o=- 2987933615 2987933615 IN IP4 192.0.2.5
s=
t=0 0
m=audio 0 RTP/AVP 0 8 3
m=video 9 RTP/AVP 98
C=IN IP4 0.0.0.0
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**5-6. SIP 183 (Session Progress) response to SIP INVITE request (UE-2 to SCC AS)**

The UE-2 responds with SIP 183 (Session Progress) response containing the SDP answer of UE-2.

**Table A.9.3-5: SIP 183 (Session Progress) response (UE-2 to Intermediate IM CN subsystem entities)**

```

SIP/2.0 183 Session Progress
Via:
Record-Route: sip:sccas1.homel.example.net
To: <sip:user2@example1.net>;tag=edfcb
From: sip:user1@example1.net;tag=acegi
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity: sip:user1@example1.net
Require:
Contact: <sip:user1@example1.net;gr= urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6>;
Allow:
Content-Type: application/sdp
Content-Length:(...)

v=0
o=- 2987933615 2987933615 IN IP4 192.0.2.5
s=
t=0 0
m=audio 0 RTP/AVP 0 8 3
m=video 1300 RTP/AVP 98
a=inactive
C=IN IP4 145.23.77.88
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**7. SIP INVITE request (SCC AS to Intermediate IM CN subsystem entities) - see example in table A.9.3-7**

The SCC AS sends the SIP INVITE request, which contains the SDP information of UE-1 and UE-2, towards the Intermediate IM CN subsystem entities, i.e. S-CSCF serving for remote UE.

**8a. SIP INVITE request (Intermediate IM CN subsystem entities to UE-3)**

Intermediate IM CN subsystem entities, i.e. S-CSCF serving for remote UE, determine that the SIP INVITE request should be forked, and send the SIP INVITE request to UE-3.

**8b. SIP INVITE request (Intermediate IM CN subsystem entities to UE-4)**

Intermediate IM CN subsystem entities, i.e. S-CSCF serving for remote UE, determine that the SIP INVITE request should be forked, and send the SIP INVITE request to UE-4.

**9a-10a. SIP 183 (Session Progress) response to SIP INVITE request (UE-3 to SCC AS)**

The remote UE-3 responds with SIP 183 (Session Progress) response containing the SDP answer of the remote UE-3.

**Table A.9.3-9a: SIP 183 (Session Progress) response (UE-3 to Intermediate IM CN subsystem entities)**

```
SIP/2.0 183 Session Progress
Via:
Record-Route: sip:sccas1.home1.example.net
To: sip:user3@example1.net;tag = 66666
From: sip:user1@example1.net;tag=acegi
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: <sip:user3@example1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6>;
Allow:
Content-Type: application/sdp
Content-Length:(...)

v=0
o=- 2987933615 2987933615 IN IP4 192.1.3.9
s=
t=
c=IN IP4 192.1.3.9
a=creq:ccap-v0
m=audio 3370 RTP/AVP 0 8 3
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=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:96 telephone-event
a=maxptime:20
m=video 4390 RTP/AVP 98
C=IN IP4 192.1.3.9
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

**11a-12a. SIP 183 (Session Progress) response to SIP INVITE request (SCC AS to UE-1)**

The SCC AS responds UE-1 with SIP 183 (Session Progress) response containing the SDP answer of UE-3.

**13a-14a. SIP UPDATE request (SCC AS to UE-2) – see example in table A.9.3-9a**

The SCC AS sends a SIP UPDATE request to UE-2 based on the SIP 183 (Session Progress) response from UE-3.



**Table A.9.3-13a: SIP UPDATE request (SCC AS to UE-2)**

```
UPDATE sip:user2@example1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
Record-Route:
To: sip:user2@example1.net; tag=edfcb
From: sip:user1@example1.net;tag=acegi
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity: "remote user" sip:user3@example1.net
Require:
Contact: sip:user3@example1.net;gr=urn:uuid:f81d4fae-17oct-11a1-a678-0054c91eabcd
Allow:
Content-Type: application/sdp
Content-Length:(...)

v=0
o=- 1027933615 1027933615 IN IP4 192.0.2.23
s=-
t=0 0
m=audio 0 RTP/AVP 0 8 3
m=video 4390 RTP/AVP 34
a= sendrecv
c=IN IP4 192.0.2.23
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

**15a-16a. SIP 200 (OK) response to SIP UPDATE request (UE-2 to SCC AS)**

UE-2 sends the SIP 200 (OK) response to SIP UPDATE request towards the SCC AS.

**9b-10b. SIP 183 (Session Progress) response to SIP INVITE request (UE-4 to SCC AS)**

The remote UE-4 responds with SIP 183 (Session Progress) response containing the SDP answer of the remote UE-4.

**Table A.9.3-9b: SIP 183 (Session Progress) response (UE-4 to Intermediate IM CN subsystem entities)**

```

SIP/2.0 183 Session Progress
Via:
Record-Route:
To: sip:user3@example1.net;tag=77777
From: sip:user1@example1.net;tag=acegi
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:user3@example1.net;gr=urn:uuid:f81d4fae-170ct-11a1-a678-0054c91eabcd
Allow:
Content-Type: application/sdp
Content-Length:(...)

v=0
o=- 2987933615 2987933615 IN IP4 192.1.4.8
s=
t=
c=IN IP4 192.1.4.8
a=creg:ccap-v0
m=audio 3570 RTP/AVP 0 8 3
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:96 telephone-event
a=maxptime:20
m=video 3580 RTP/AVP 98
C=IN IP4 192.1.4.8
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**11b-12b. SIP 183 (Session Progress) response to SIP INVITE request (SCC AS to UE-1)**

The SCC AS responds UE-1 with SIP 183 (Session Progress) response containing the SDP answer of UE-4.

**13b. The SCC AS saves the SIP 183 (Session Progress) response when determining that the session is forked**

The SCC AS determines that the call is forked according to step 10a and 10b and saves the SIP 183 message of step 10b.

**14-15. SIP 200 (OK) response to the initial SIP INVITE request (UE-4 to SCC AS)**

When the remote UE answers the call, UE-4 sends the SIP 200 (OK) response back to UE-1 via the SCC AS.

**16-17. SIP 200 (OK) response to the initial SIP INVITE request (SCC AS to UE-1)**

The SCC AS sends the SIP 200 (OK) response to UE-1.

**18-19. SIP ACK request (UE-1 to SCC AS)**

UE-1 sends the SIP ACK request to confirm the establishment of call to SCC AS.

**20-21. SIP ACK request (SCC AS to UE-4)**

SCC AS sends the SIP ACK request to UE-4.

**22-23. SIP UPDATE request (SCC AS to UE-2) – see example in table A.9.3-22a**

The SCC AS sends to UE-2 a SIP UPDATE request with the saved information in SIP 183 (Session Progress) response in step 13b to control the renegotiation of the video media when determining that the UE-4 has answered the call.

**Table A.9.3-22a: SIP UPDATE request (SCC AS to UE-2)**

```

UPDATE sip:user2@example1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
Record-Route:
To: sip:user2@example1.net;
From: sip:user1@example1.net;tag=acegi
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity: "remote user" sip:user3@example1.net
Require:
Contact: sip:user3@example1.net;gr=urn:uuid:f81d4fae-17oct-11a1-a678-0054c91eabcd
Allow:
Content-Type: application/sdp
Content-Length:(...)

v=0
o=- 1027933615 1027933615 IN IP4 192.0.2.23
s=-
t=0 0
m=audio 0 RTP/AVP 0 8 3
m=video 3580 RTP/AVP 98
a= sendrecv
c=IN IP4 192.1.4.8
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**24-25. SIP 200 (OK) response to SIP UPDATE request (UE-2 to SCC AS)**

UE-2 sends the SIP 200 (OK) response towards SCC AS.

**26-27. SIP 200 (OK) response to SIP INVITE request (UE-2 to SCC AS)**

UE-2 sends the SIP 200 (OK) response to the SIP INVITE request in step 4 towards SCC AS.

**28-29. SIP ACK request (SCC AS to UE-2)**

SCC AS sends the SIP ACK request to UE-2.

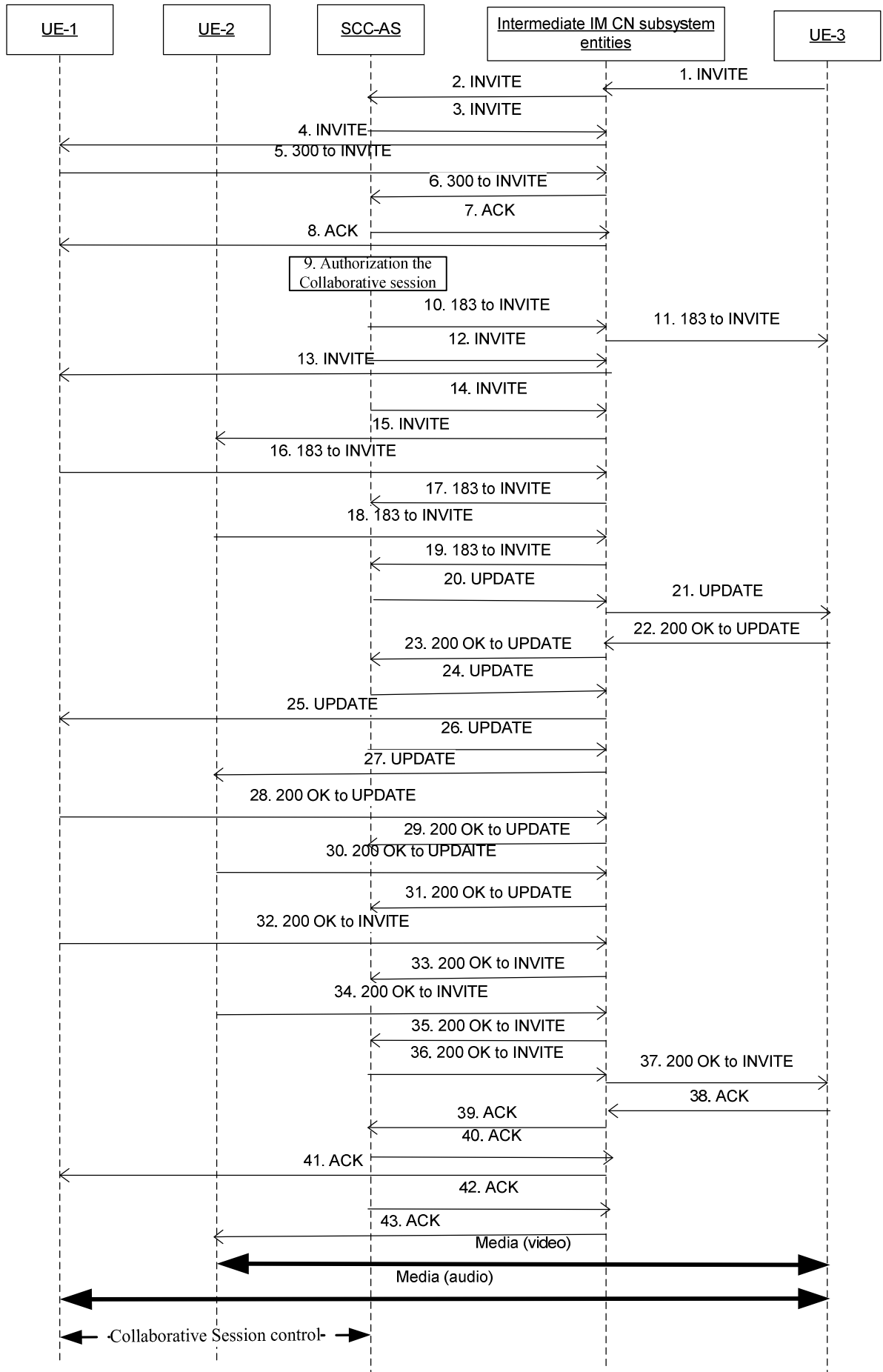
**30-32. SIP CANCEL request ( Intermediate IM CN subsystem entities to UE-3)**

The intermediate IM CN subsystem entities sends the SIP CANCEL request to UE-3.

**33-35. SIP 200 (OK) response to SIP CANCEL request (UE-3 to Intermediate IM CN subsystem entities)**

UE-3 responds SIP 200 (OK) response to the SIP CANCEL request

## A.9.4 Collaborative session establishment upon terminating session setup



### Figure A.9.4-1: Call flows for establishment of collaborative session upon terminating IMS session setup using SIP 300 (Multiple Choices) response

NOTE: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

#### 1-2. SIP INVITE request (UE-3 to SCC AS) - see example in table A.9.4-1

The UE-3 sends SIP INVITE request to UE-1 to setup the session.

**Table A.9.4-1: SIP INVITE request (UE-3 to Intermediate IM CN subsystem entities)**

```

INVITE sip:user1@example1.net SIP/2.0
Via: SIP/2.0/UDP 192.0.2.5;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route: sip:pcscf1.homel.net:7531;lr;comp=sigcomp, <sip:orig@scscf1.homel.net;lr>
P-Preferred-Identity: <sip:uesr3@example1.net>
P-Access-Network-Info:
Privacy: none
From: <sip:user3@example1.net>; tag=171828
To: <sip:user1@example1.net>
Call-ID: cb03a0s09a2sdfgk490237
Cseq: 127 INVITE
Supported: 100rel; precondition, gruu, 199
Require: sec-agree, replaces
Proxy-Require: sec-agree
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3gpp-service.ims.icsi.mmtel"
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi=87654321; port1=7531
Contact:<sip:user3@example1.net;gr= urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE
Accept: application/sdp; application/3gpp-ims+xml
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP4 192.0.2.5
s=
t=0 0
c=IN IP4 192.0.2.5
m=audio 49170 RTP/AVP 0 8 3
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:96 telephone-event
a=maxptime:20
m=video 28540 RTP/AVP 98
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

#### 3-4. SIP INVITE request (SCC AS to UE-1) - see example in table A.9.4-3

The SCC AS adds an Accept-Contact header field containing the media feature tag g.3gpp.iut-controller along with the explicit parameter to indicate a preference to reach a controller capable UE and also includes the MIME type application/vnd.3gpp.iut+xml to indicate that it supports the MIME type and then sends the SIP INVITE request to UE-1 to setup the session.

**Table A.9.4-3: SIP INVITE request (SCC AS to Intermediate IM CN subsystem entities)**

```

INVITE sip:user1@example1.net SIP/2.0
Via:
Max-Forwards:
Route:
P-Asserted-Identity: <sip:uesr3@example1.net>
Privacy: none
From:
To:
Cseq:
Supported:
Require:
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3gpp-service.ims.icsi.mmtel"
Accept-Contact: *;+g.3gpp.iut-controller;explicit
Contact:
Allow:
Accept: application/sdp; application/3gpp-ims+xml; application/vnd.3gpp.iut+xml
Content-Type:
Content-Length: (...)

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

```

**5-6. SIP 300 (Multiple Choices) response to SIP INVITE request (UE-1 to SCC AS) see example in table A.18.3-5**

The UE-1 responds with SIP 300 (Multiple choices) response to SCC AS including in the body the media characteristics (Audio and Video) associated with the contact addresses of UE-1 and UE-2 respectively.

**Table A.9.4-5: SIP 300 (Multiple Choices) response (UE-1 to SCC-AS)**

```

SIP/2.0 300 Multiple Choices
Via:
To:
From:
Call-ID:
CSeq:
P-Asserted-Identity: sip:user1@example.net
Contact: <sip:user1@example.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz>,
<sip:user1@example.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6>
Allow:
Content-Type=application/vnd.3gpp.iut+xml
Content-Length: (...)

<controlTransfer>
<activeController=<sip:user1@example.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91ewxyz?body=m%3Daudio%2049170%20RTP%2FAVP%97%0D>/>
<controllee=<sip:user1@example.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-
00a0c91e6bf6?body=m%3Dvideo%2028540%20RTP%2FAVP%98%0D>/>
</controlTransfer>

```

**7-8. SIP ACK request (SCC AS to UE-1)**

**9. SCC AS authorizes the request for the collaborative session setup involving UE-2.****10-11. SIP 183 (session progress) response to SIP INVITE request (SCC AS to UE-3)**

The SCC AS responds with SIP 183 (session progress) response to UE-3 including an SDP answer based on the media types contained in the SIP 300 (Multiple choices) response and containing the discard port number "9" for those media lines with "a=inactive".

**Table A.9.4-10: SIP 183 (Session Progress) response (SCC-AS to UE-3)**

```
SIP/2.0 183 Session Progress
Via:
To:
From:
Call-ID:
CSeq:
P-Asserted-Identity: sip:user1@example.net
Privacy:
Require:
Supported:
Contact: <sip:user1@example.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz>
Allow:
Content-Type=application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP4 0.0.0.0
s=
t=0 0
c=IN IP4 0.0.0.0
m=audio 9 RTP/AVP 0 8 3
a=inactive
m=video 9 RTP/AVP 98
a=inactive
```

**12-13. SIP INVITE request (SCC AS to UE-1)- - see example in table A.9.4-12**

The SCC AS sends the SIP INVITE request to initiate the audio media setup in UE-1.



**Table A.9.4-12: SIP INVITE request (SCC AS to Intermediate IM CN subsystem entities)**

```

INVITE sip:user1@example.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz SIP/2.0
Via: SIP/2.0/UDP 192.0.2.5;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route:
P-Preferred-Identity: <sip:uesr3@example1.net>
P-Access-Network-Info:
Privacy: none
From: <sip:user3@example1.net>; tag=171828
To: <sip:user1@example1.net>
Call-ID: cb03a0s09a2sdfglkj490237
Cseq: 127 INVITE
Supported: 100rel; precondition, gruu, 199
Require: sec-agree, replaces
Proxy-Require: sec-agree
Accept-Contact: *;+g.3gpp.icsi-ref="urn%3Aurn-7%3gpp-service.ims.icsi.mmtel"
Security-Verify: ipsec-3gpp; q=0.1; alg=hmac-sha-1-96; spi=87654321; port1=7531
Contact:<sip:user3@example1.net;gr= urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6>;
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE
Accept: application/sdp; application/3gpp-ims+xml
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP4 192.0.2.5
s=
t=0 0
c=IN IP4 192.0.2.5
m=audio 49170 RTP/AVP 0 8 3
b=AS:25.4
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos none remote sendrecv
a=rtpmap:97 AMR
a=fmtp:97 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:96 telephone-event
a=maxptime:20
m=video 0 RTP/AVP 98

```

**14-15. SIP INVITE request (SCC AS to UE-2)- - see example in table A.9.4-14**

The SCC AS sends the SIP INVITE request to initiate the video media setup in UE-2.

**Table A.9.4-14: SIP INVITE request (SCC AS to Intermediate IM CN subsystem entities)**

```

INVITE sip:user1@example.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via: SIP/2.0/UDP 192.0.2.5;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
Route:
P-Preferred-Identity: <sip:uesr3@example1.net>
P-Access-Network-Info:
Privacy: none
From: <sip:user3@example1.net>; tag=171828
To: <sip:user1@example1.net>
Call-ID: cb03a0s09a2sdfglkj490237
Cseq: 127 INVITE
Supported: 100rel; precondition, gruu, 199
Require: sec-agree, replaces
Proxy-Require: sec-agree
Accept-Contact: *;+g.3gpp.icsi-ref="urn:3Aurn-7%3gpp-service.ims.icsi.mmtel"
Security-Verify: ipsec-3gpp; q=0.1; alg= hmac-sha-1-96; spi=87654321; port1=7531
Contact:<sip:user3@example1.net;gr= urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6>;
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE
Accept: application/sdp; application/3gpp-ims+xml
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP4 192.0.2.5
s=
t=0 0
c=IN IP4 192.0.2.5
m=audio 0 RTP/AVP 97
m=video 28540 RTP/AVP 98
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**20-21. SIP UPDATE request (SCC AS to UE-3)- - see example in table A.9.4-20**

The SCC AS then sends the SIP UPDATE request to UE-3 with the SDP answer of UE-1 and UE-2 received in the SIP 183 (session progress) responses.

**Table A.9.4-20: SIP UPDATE request (SCC AS to Intermediate IM CN subsystem entities)**

```

UPDATE sip:user3@example1.net SIP/2.0
Via:
To: sip:user3@example.net;tag = 66666
From: sip:user1@example.net; tag=33333
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:user1@example.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
t=0 0
m=audio 1300 RTP/AVP 96 97
c=IN IP4 123.45.67.89
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1500 RTP/AVP 98
c=IN IP4 123.45.67.42
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**22-23. SIP 200 (OK) response to SIP UPDATE request (UE-3 to SCC AS)**

UE-3 sends the SIP 200 (OK) response to the SIP UPDATE request.

**24-25. SIP UPDATE request (SCC AS to UE-1)**

The SCC AS sends the SIP INVITE request to the UE-1 based on the SDP content in the SIP 200 (OK) response to the SIP UPDATE request received from UE-3.

**26-27. SIP UPDATE request (SCC AS to UE-2)**

The SCC AS sends the SIP INVITE request to the UE-2 based on the SDP content in the SIP 200 (OK) response to the SIP UPDATE request received from UE-3.

**28-29. SIP 200 (OK) response to SIP UPDATE request (UE-1 to SCC AS)****30-31. SIP 200 (OK) response to SIP UPDATE request (UE-2 to SCC AS)****32-33. SIP 200 (OK) response to SIP INVITE request (UE-1 to SCC AS)**

When the UE-1 answers the call, it sends the SIP 200 (OK) response to the initial SIP INVITE request.

**34-35. SIP 200 (OK) response to SIP INVITE request (UE-2 to SCC AS)**

When the UE-2 answers the call, it sends the SIP 200 (OK) response to the initial SIP INVITE request.

**36-37. SIP 200 (OK) response to SIP INVITE request (SCC AS to UE-3)**

The SCC AS sends the SIP 200 (OK) response to the UE-3.

**38-39. SIP ACK request (UE-3 to SCC AS)****40-41. SIP ACK request (SCC AS to UE-1)****42-43. SIP ACK request (SCC AS to UE-2)**

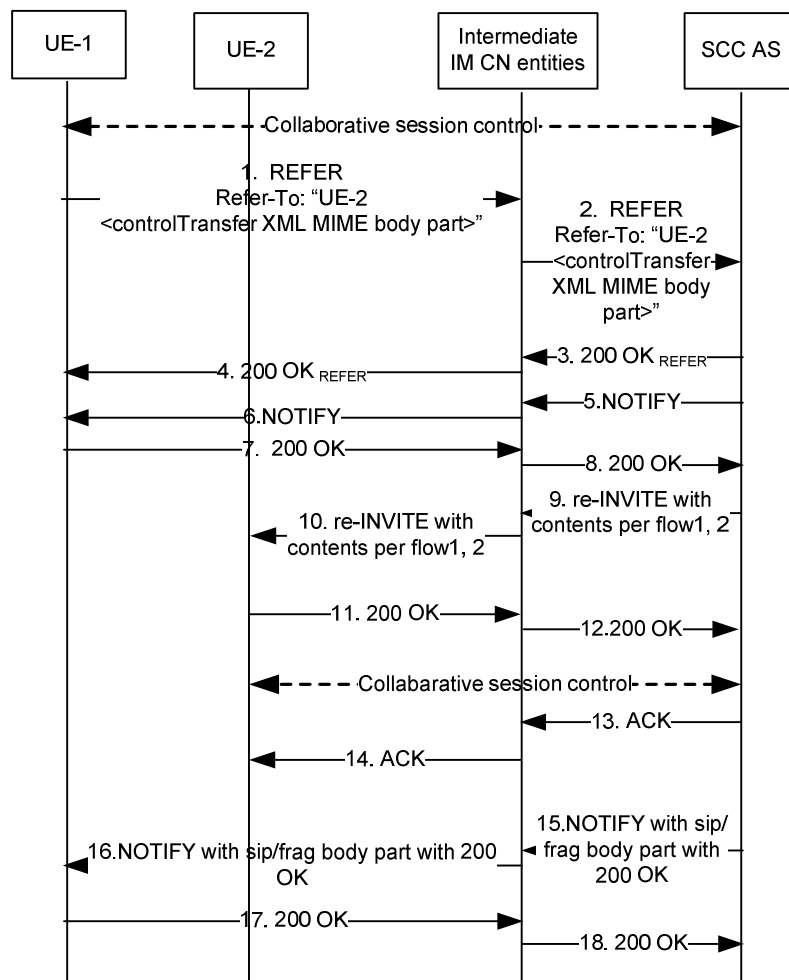
# A.10 Signalling flows for assignment and transfer of control of a collaborative session

## A.10.1 Introduction

The signalling flows in this subclause demonstrate how a UE-1 can transfer control of the collaborative session to UE-2.

## A.10.2 Transfer of control of a collaborative session without media transfer

It is assumed that UE-1 is the controller UE having collaborative session control. A user has a multimedia session on his device UE-1 with voice (Media A) and video (Media B) media flows. The controller UE, UE-1 initiates the transfer of collaborative session control to UE-2 without transferring media from UE-1.



**Figure A.10.2-1: Controller UE transfers collaborative session control without transferring media**

NOTE: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

### 1-2. SIP REFER request (controller UE to intermediate IM CN subsystem entities) – see example in table A.10.2-1

It is assumed that UE-1 and UE-2 have the controller UE functionality. The controller UE wants to transfer control of the collaborative session to UE-2.

UE-1 sends a SIP REFER request to the SCC AS containing:

- a) the Refer-To header field SIP URI containing:
  - i) The GRUU of UE 2;
  - ii) A "body" URI header field containing the <controlTransfer> XML element including the <targetController> element set to the GRUU of UE-2.
- b) the Contact header field containing the media feature tag g.3gpp.current-iut-controller set to "passive"

UE-1 does not include the g.3gpp.iut-controller media feature tag in the Contact header field of the SIP REFER request as it is indicating to the SCC-AS that it is transferring control of the collaborative session to UE-2.

**Table A.10.2-1: SIP REFER request (UE-1 to SCC AS)**

```
REFER sip:interUEtransfer@example.net SIP/2.0
Via:
To: sip:interUEtransfer@example.net
From: sip:user1_public1@home1.net;tag=13579
Call-ID: cb03a0s09a2sdfglkj490333
CSeq: 93809824 REFER
Max-Forwards: 70
P-Preferred-Identity: "John Doe" <sip:user1_public1@home1.net>
Refer-To: <sip:user2_public2@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-00a0c91e6bf6?body=<controlTransfer> <targetController=<sip:user2_public2@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-00a0c91e6bf6>/>>
Require: target-dialog
Target-dialog: cb03a0s09a2sdfglkj13579;to-tag=abcdef;from-tag=123456
Referred-By: sip:user1_public1@home1.net
Contact: sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz;+g.3gpp.current-iut-controller=passive
Accept: message/sipfrag,application/vnd.3gpp.iut+xml
Content-Length: 0
```

### 3-4. SIP 200 (OK) response

The SCC AS sends a SIP 200 (OK) response to the controller UE-1 as response to the SIP REFER request.

### 5-6. SIP NOTIFY request (SCC AS to UE-1 through intermediate IM CN subsystem entities)-

The SCC AS sends a SIP NOTIFY request to UE-1 to notify implicit subscription to the SIP REFER request results.

### 7-8. SIP 200 (OK) response (UE-1 to SCC AS through intermediate IM CN subsystem entities)

The controller UE, UE-1, acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS.

### 9. SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities) - see example in table A.10.2-9

The SCC AS sends a SIP re-INVITE request towards the Controllee UE (UE-2). The re-INVITE request contains the XML body from the URI in the Refer-To header field from the SIP REFER request.

**Table A.10.2-9: SIP re-INVITE request (SCC AS to IM CN subsystem entities)**

```

INVITE sip:user2_public1@home1.net;gr=urn:uuid:f 81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
Route:
To: sip:user2_public1@home1.net;abcdef
From: sip:user3_public3@home3.net;tag=123456
Call-ID:
CSeq:
Max-Forwards:
Require:
Referred-By: sip:user1_public1@home1.net
Contact: sip:user3_public3@home3.net;gr=urn:uuid:f81d4fae-17oct-11a1-a678-0054c91eabcd
Allow:
Accept: application/vnd.3gpp.iut+xml
Content-Type: multipart/mixed;boundary="boundary1"
Content-Length: {...}

--boundary1
Content-Type: application/sdp

v=0
o=- 1027933615 1027933615 IN 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

--boundary1
Content-Type: application/vnd.3gpp.iut+xml;handling=optional

<controlTransfer>
  <targetController=<sip:user2_public2@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-
    00a0c91e6bf6>/>
</controlTransfer>
--boundary1

```

**10. SIP re-INVITE request (intermediate IM CN subsystem entities to UE-2)****11-12. SIP 200 (OK) response (UE-2 to SCC AS through intermediate IM CN subsystem entities) - see example in table A.10.2-11**

UE-2 accepts the transfer of control and indicates this by including a `g.3gpp.current-iut-controller` media feature tag set to Active in the SIP 200 (OK) response it sends to the SCC AS.

**Table A.10.2-11: SIP 200 (OK) response (UE-2 to SCC-AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user1_public2@home1.net;tag=xyzwv
From: sip:interUEtransfer@example.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6;+g.3gpp.
        current-iut-controller=Active
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
c=145.23.77.88
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**13-14. SIP ACK request (from SCC AS to UE-2)****15-16. SIP NOTIFY request (SCC AS to UE-1) - see example table A.10.2-15**

The SCC AS sends a SIP NOTIFY request to the controller UE, UE-1, to inform about the success status of the control transfer. The body of the SIP NOTIFY request contains a sipfrag including the Contact header field containing the g.3gpp.current-iut-controller media feature tag set to Active from the received SIP 200 (OK) response from UE-2

**Table A.10.2-15: SIP NOTIFY request (SCC AS to UE-1)**

```

NOTIFY sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91ewxyz SIP/2.0
Via:
To: sip:user1_public1@home1.net;tag = 13579
From: sip:interUEtransfer@example.net;tag=2255
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:sccas1.home1.example.net
Allow:
Event: refer
Subscription-State:terminated; reason=noresource
Content-Type: message/sipfrag ;version=2.0
Content-Length: (...)

SIP/2.0 200 OK
Content-Type=application/sdp
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6;+g.3gpp.
        current-iut-controller=Active

v=0
s=-
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**17-18. SIP 200 (OK) response (UE-1 to SCC AS)**

The controller UE, UE-1, acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS.

---

## A.11 Signalling flows for media flow transfer

### A.11.1 Introduction

This subclause describes signalling flows for media flow transfer. Four different scenarios are considered in the clause:

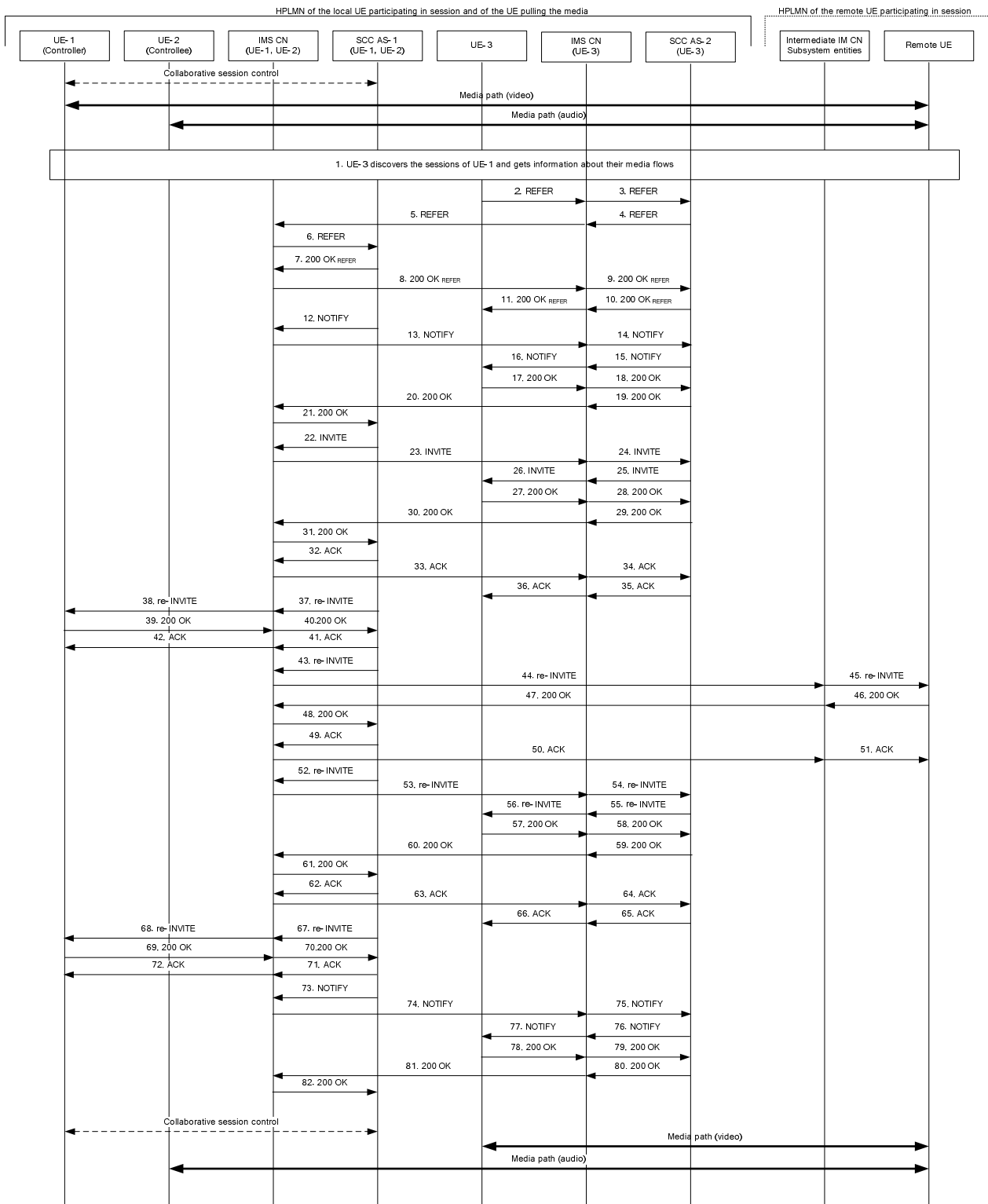
- subclause A.11.2 shows an example when Media flows transfer initiated by a UE not participating in the ongoing collaborative session;
- subclause A.11.3 shows an example when Media flows transfer initiated when no collaborative session has been established;
- subclause A.11.4 shows an example when Media flows transfer initiated by a controllee UE of an ongoing collaborative session; and
- subclause A.11.5 shows an example when Controllee UE initiated addition of media to another controllee UE.

### A.11.2 Media flows transfer initiated by a UE not participating in the ongoing collaborative session

This subclause describes the scenario when the Media flow is transferred from UE-1 to UE-3 requested by UE-3 and the UE-3 becomes a new Controllee UE. The flow diagram shows when UE-1 and UE-3 belong to the different subscription. The SCC AS-1 is controlling the collaborative session.

UE-1(123.45.67.89) and UE-2 (123.112.67.87) are included in a Collaborative Session with the remote UE (132.54.76.98), in which UE-1 is the Controller UE and UE-2 is the Controllee UE. Media paths exist between UE-1 and remote UE(video) and between UE-2 and remote UE(audio). The video component is bidirectional from the remote UE to the controller UE, UE-1. The UE-3(123.23.45.67) wants to pull the media flow between UE-1 and remote UE. After this procedure, the UE-3 will be in collaborative session.





**Figure A.11.2-1: Signalling flow for Media flows transfer initiated by a UE not participating in the ongoing collaborative session**

**1. UE-3 discovers the sessions of UE-1.**

**2-6. SIP REFER request (from UE-3 to controller UE, UE-1)**

The UE-3 sends SIP REFER request to the controller UE, UE-1 to request the media transfer. The SIP REFER request is finally routed to the SCC AS-1 serving UE-1.

**Table A.11.2-2: SIP REFER request (UE-3 to UE-1)**

```

REFER sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111 SIP/2.0
Via: SIP/2.0/UDP [3333::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7dfdsdq
To: <sip:user1_public1@home1.net>
From: <sip:user2_public1@home2.net>;tag=294756
Call-ID: Asdasd23123366
Cseq: 4897924 REFER
Max-Forwards: 70
P-Preferred-Identity: <sip:user2_public1@home2.net>;
Refer-To: <sip:user2_public1@home2.net; gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333?body=
m%3Daudio%20%20RTP%2FAVP%97%0Dm%3Dvideo%203002%20RTP%2FAVP%2098%2099>
Require: target-dialog
Target-dialog: cb03a0s09a2sdfglkj11111;remote-tag=27364;local-tag=11928
Referred-By: sip:user2_public1@home2.net
Contact: sip:user2_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333
Accept-Contact: * ;+g.3gpp.iut-focus;explicit;require
Accept: application/sdp, message/sipfrag
Content-Length: 0

```

**7-11. SIP 200 (OK) response (from SCC AS-1 serving UE-1 to UE-3)**

SCC AS-1 serving UE-1 sends a SIP 200 (OK) response to UE-3 as response to the SIP REFER request.

**12-16. SIP NOTIFY request (from SCC AS-1 serving UE-1 to UE-3)**

The SCC AS-1 serving UE-1 sends a SIP NOTIFY request to UE-3 to notify implicit subscription to the SIP REFER request results.

**Table A.11.2-12: SIP NOTIFY request (SCC AS-1 to UE-3)**

```

NOTIFY sip:user2_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333 SIP/2.0
Via:
To: sip:user2_public2@home2.net;tag=1234
From: sip: sip:interUEtransfer@sccas1.home1.net;tag=3456
Call-ID:
CSeq:
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net
Allow:
Event: refer
Subscription-State: active; expires=3600
Content-Type: message/sipfrag; version=2.0
Content-Length: (...)

SIP/2.0 100 Trying

```

**17-21. SIP 200 (OK) response (from UE-3 to SCC AS-1 serving UE-1)**

The UE-3 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS-1.

**22-26. SIP INVITE request (from SCC AS-1 serving UE-1 to UE-3)**

Since the message 2-6 contains a Refer-to header field addressed to UE-3 and the URI parameters, listing an video line which is not currently supported by another UE than controller UE, the SCC AS-1 realizes the procedure is for transferring the media from that controller UE (UE-1) to UE-3. The SCC AS-1 sends a SIP INVITE request to the UE-3, to transfer the video media component.

**Table A.11.2-22: SIP INVITE request (SCC AS-1 serving UE-1 to UE-3)**

```

INVITE sip:user2_public1@home2.net; gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333 SIP/2.0
Via: SIP/2.0/UDP sccas1.home1.net; branch=z9hG4bK332b33.3;
To: sip:user2_public1@home2.net;
From: sip:interUEtransfer@sccas1.home1.net; tag=12486
Call-ID: cb03a0s09a2sdfglkj33333
Cseq: 111 INVITE
Max-Forwards: 70
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net; +g.3gpp.iut-focus
Allow:
Accept:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 3002 RTP/AVP 98 99
a=sendonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**27-31. SIP 200 (OK) response (from UE-3 to SCC AS-1 serving UE-1)**

The target UE, UE-3, acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCCAS-1.

**Table A.11.2-27: SIP 200 (OK) response (UE-3 to SCC AS-1 serving UE-1)**

```

SIP/2.0 200 OK
Via:
To: sip:user2_public1@home2.net; tag = 24861
From: sip:interUEtransfer@sccas1.home1.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: <sip:user2_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.23.45.67
s=-
c=123.23.45.67
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
a=recvonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**32-36. SIP ACK request (from SCC AS-1 serving UE-1 to target UE; UE-3)**

The SCC AS-1 serving UE-1 sends a SIP ACK request to the UE-3.

**37-38. SIP re-INVITE request (from SCC AS-1 serving UE-1 to controller UE; UE-1)**

**Table A.11.2-37: SIP INVITE request (SCC AS-1 serving UE-1 to UE-1)**

```

INVITE sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111 SIP/2.0
Via:
To: sip:user1_public1@home1.net;Tag=11928
From: sip:userR_public1@homeR.net; tag=27364
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net;+g.3gpp.iut-focus
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=sendonly

```

**39-40. SIP 200 (OK) response (from controller UE, UE-1 to SCC AS-1 serving UE-1)**

The UE-1 sends a SIP 200 (OK) response with an SDP answer.

**Table A.11.2-39: SIP 200 (OK) response (UE-1 to SCC AS-1 serving UE-1)**

```

SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>;
+g.3gpp.iut-controller
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=123.45.67.89
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
a=inactive

```

**41-42. SIP ACK request (from SCC AS-1 serving UE-1 to controller UE; UE-1)**

The SCC AS-1 serving UE-1 sends a SIP ACK request to the UE-1.

**43-45. SIP re-INVITE request (from SCC AS-1 serving UE-1 to remote UE)**

The SCC AS-1 serving UE-1 sends a SIP re-INVITE request to the remote UE.

**Table A.11.2-43: SIP INVITE request (SCC AS-1 serving UE-1 to remote UE)**

```

INVITE sip:userR_public1@homeR.net SIP/2.0
Via:
To: sip:userR_public1@homeR.net;tag=27364
From: sip:user1_public1@home1.net;tag=11928
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: <sip:interUEtransfer@sccas1.home1.net>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
t=0 0
m=audio 1300 RTP/AVP 96 97
c=IN IP4 123.112.67.87
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
c=IN IP4 123.23.45.67
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**46-48. SIP 200 (OK) response (from remote UE to SCC AS-1 serving UE-1)**

The remote UE acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC AS-1.

**Table A.11.2-46: SIP 200 (OK) response (remote UE to SCC AS-1 serving UE-1)**

```

SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Asserted-Identity:
Contact: sip:userR_public1@homeR.net
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**49-51. SIP ACK request (from SCC AS-1 serving UE-1 to remote UE)**

The SCC AS-1 serving UE-1 sends a SIP ACK request to the remote UE.

### 52-56. SIP re-INVITE request (from SCC AS-1 serving UE-1 to UE-3)

The SCC AS-1 serving UE-1 sends a SIP re-INVITE request to UE-3 to activate the video media component.

**Table A.11.2-52: SIP INVITE request (SCC AS-1 serving UE-1 to UE-3)**

```
INVITE sip:user2_public1@home2.net; gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333 SIP/2.0
Via: SIP/2.0/UDP sccas1.home1.net; branch=z9hG4bK332b33.3;
To: sip:user2_public1@home2.net;
From: sip:interUEtransfer@sccas1.home1.net; tag=12486
Call-ID: cb03a0s09a2sdfglkj33333
Cseq: 111 INVITE
Max-Forwards: 70
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net;+g.3gpp.iut-focus
Allow:
Accept:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

### 57-61. SIP 200 (OK) response (from UE-3 to SCC AS-1 serving UE-1)

The target UE, UE-3, acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCCAS-1 serving UE-1.

**Table A.11.2-57: SIP 200 (OK) response (UE-3 to SCC AS-1 serving UE-1)**

```
SIP/2.0 200 OK
Via:
To: sip:user2_public1@home2.net; tag = 24861
From: sip:interUEtransfer@sccas1.home1.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: <sip:user2_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.23.45.67
s=-
c=123.23.45.67
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

### 62-66. SIP ACK request (from SCC AS-1 serving UE-1 to target UE; UE-3)

The SCC AS-1 serving UE-1 sends a SIP ACK request to the UE-3.

### 67-68. SIP re-INVITE request (from SCC AS-1 serving UE-1 to controller UE; UE-1)

The SCC AS-1 sends a SIP re-INVITE request to the controller UE. Since UE-1 keep the collaborative session control, SCC AS-1 sends the re-INVITE instead of BYE in spite of no media flow at UE-1.

**Table A.11.2-67: SIP INVITE request (SCC AS-1 serving UE-1 to UE-1)**

```
INVITE sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111 SIP/2.0
Via:
To: sip:user1_public1@home1.net;Tag=11928
From: sip:userR_public1@homeR.net; tag=27364
Call-ID: cb03a0s09a2sdfgkjl11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 0 RTP/AVP 98 99
```

**69-70. SIP 200 (OK) response (from controller UE, UE-1 to SCC AS-1 serving UE-1)**

The UE-1 sends a SIP 200 (OK) response with an SDP answer.

**Table A.11.2-69: SIP 200 (OK) response (UE-1 to SCC AS-1 serving UE-1)**

```
SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>;
+g.3gpp.iut-controller
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=123.45.67.89
t=0 0
m=audio 0 RTP/AVP 97
m=video 0 RTP/AVP 98 99
```

**71-72. SIP ACK request (from SCC AS-1 serving UE-1 to controller UE; UE-1)**

The SCC AS-1 sends a SIP ACK request to the UE-1.

**73-77. SIP NOTIFY request (from SCC AS-1 serving UE-1 to UE-3)**

The SCC AS-1 serving UE-1 sends a SIP NOTIFY request including the SIP final response as a sipfrag body to the UE-3 to inform about the success status of the inter-UE transfer.

**Table A.11.2-73: SIP NOTIFY request (SCC AS-1 to UE-3)**

```

NOTIFY sip:user2_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333 SIP/2.0
Via:
To:sip:user2_public2@home2.net;tag=1234
From:sip: sip:interUEtransfer@sccas1.home1.net;tag=3456
Call-ID:
CSeq:
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net
Allow:
Event:refer
Subscription-State:terminated; reason=noresource
Content-Type: message/sipfrag; version=2.0
Content-Length: (...)

SIP/2.0 200 OK
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>;
+g.3gpp.iut-controller
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=123.45.67.89
t=0 0
m=audio 0 RTP/AVP 97
m=video 0 RTP/AVP 98 99

```

**78-82. SIP 200 (OK) response (from UE-3 to SCC AS-1 serving UE-1)**

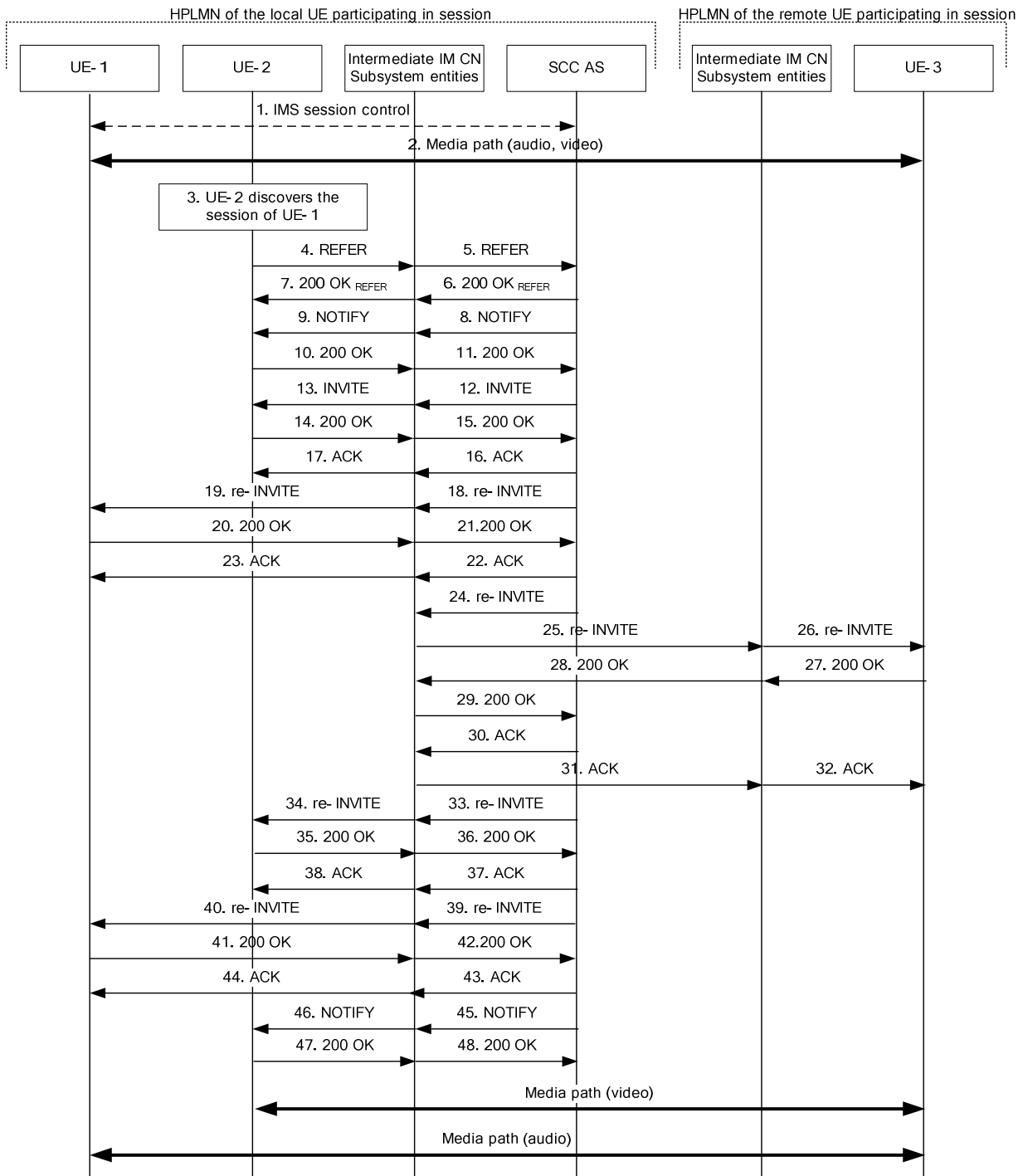
The UE-3 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS-1.

### A.11.3 Media flows transfer initiated when no collaborative session has been established

This subclause describes the scenario when the media flow is transferred from UE-1 to UE-2 requested by UE-2. The flow diagram shows when UE-1 and UE-2 belong to the same subscription.

Media path exist between UE-1(123.45.67.89) and Remote UE(132.54.76.98). UE-2(123.112.67.87) wants to pull the video media flow between UE-1 and Remote-UE. After this procedure, collaborative session will be established.





**Figure A.11.3-1 Signalling flow for Media flow transfer initiated when no collaborative session has been established**

**1-2. UE-1 is in session with Remote UE**

There is a multimedia session comprising audio and video media between the UE-1 and the Remote UE anchored at SCC AS.

**3. UE-2 discovers the session of UE-1**

**4-5. SIP REFER request (from UE-2 to SCC AS)**

The UE-2 sends SIP REFER request to the UE-1 to request the media transfer from UE-1 to UE-2. The SIP REFER request is routed to the SCC AS by filter criteria. The SCC AS does not route the SIP REFER request to

the address set in the Request-URI if there is the g.3gpp.iut-focus media feature tag in the Accept-Contact header field.

**Table A.11.3-4: SIP REFER request (UE-2 to SCC AS)**

```
REFER sip:user1_public1@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111 SIP/2.0
Via: SIP/2.0/UDP [3333::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7dfdsdq
To: <sip: user1_public1@home1.net>
From: <sip:user1_public2@home1.net>;tag=294756
Call-ID: Asdasd23123366
Cseq: 4897924 REFER
Max-Forwards: 70
P-Preferred-Identity: <sip:user1_public2@home1.net>;
Refer-To: <sip:user1_public2@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222?body=
m%3Daudio%20%20RTP%2FAVP%97%0Dm%3Dvideo%203002%20RTP%2FAVP%2098%2099>
Require: target-dialog
Target-dialog: cb03a0s09a2sdfglkj11111;remote-tag=27364;local-tag=11928
Referred-By: sip:user1_public2@home1.net
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222
Accept-Contact: +g.3gpp.iut-focus;explicit;require
Accept: application/sdp, message/sipfrag
Content-Length: 0
```

**6-7. SIP 200 (OK) response (from SCC AS to UE-2)**

SCC AS sends a SIP 200 (OK) response to UE-2 as response to the SIP REFER request.

**8-9. SIP NOTIFY request (from SCC AS to UE-2)**

The SCC AS sends a SIP NOTIFY request to UE-2 to notify implicit subscription to the SIP REFER request results.

**Table A.11.3-8: SIP NOTIFY request (SCC AS to UE-2)**

```
NOTIFY sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222 SIP/2.0
Via:
To:sip:user1_public2@home1.net;tag=1234
From:sip: sip:interUEtransfer@sccas1.home1.net;tag=3456
Call-ID:
CSeq:
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net
Allow:
Event:refer
Subscription-State:active; expires=3600
Content-Type: message/sipfrag; version=2.0
Content-Length: (...)

SIP/2.0 100 Trying
```

**10-11. SIP 200 (OK) response (from UE-2 to SCC AS)**

The UE-2 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS.

**12-13. SIP INVITE request (from SCC AS to UE-2)**

Since the 4-5 SIP REFER request contains a Refer-to header field addressed to UE-2 and the URI parameters, listing a video line which is transferred and an audio line with port number set to zero which is not transferred, The SCC-AS sends a SIP INVITE request to the UE-2, to transfer the video media component. In order to avoid to UE-2 to start sending video to the Remote UE, the SCC AS add an a line to sendonly in the SDP offer.

**Table A.11.3-12: SIP INVITE request (SCC-AS to UE-2)**

```

INVITE sip:user1_public2@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222 SIP/2.0
Via: SIP/2.0/UDP sccas.home1.net; branch=z9hG4bK332b33.3;
To: sip:user1_public2@home1.net;
From: sip:interUEtransfer@sccas1.home1.net; tag=27365
Call-ID: cb03a0s09a2sdfglkj22222
Cseq: 111 INVITE
Max-Forwards: 70
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net;+g.3gpp.iut-focus
Allow:
Accept:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 3002 RTP/AVP 98 99
a=sendonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**14-15. SIP 200 (OK) response (from UE-2 to SCC-AS)**

The target UE, UE-2, acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCC AS.

**Table A.11.3-14: SIP 200 (OK) response (UE-2 to SCC AS)**

```

SIP/2.0 200 OK
Via:
To: sip:user1_public2@home1.net; tag=36527
From: sip:interUEtransfer@sccas1.home1.net; tag=27365
Call-ID: cb03a0s09a2sdfglkj22222
CSeq:
P-Preferred-Identity:
Contact: <sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
c=123.112.67.87
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
a=inactive
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**16-17. SIP ACK request (from SCC AS to UE-2)**

The SCC AS sends a SIP ACK request to the UE-2.

**18-19. SIP re-INVITE request (from SCC AS to UE-1)**

The SCC-AS sends a SIP re-INVITE request to the UE-1 to hold the video media session to be transferred.

**Table A.11.3-18: SIP INVITE request (SCC AS to UE-1)**

```

INVITE sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111 SIP/2.0
Via:
To: sip:user1_public1@home1.net;Tag=11928
From: sip:userR_public1@home2.net; tag=27364
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net;+g.3gpp.iut-focus
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=video 3002 RTP/AVP 98 99
a=sendonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=audio 3000 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20

```

**20-21. SIP 200 (OK) response (from UE-1 to SCC AS)**

The UE-1 sends a SIP 200 (OK) response with an SDP answer.

**Table A.11.3-20: SIP 200 (OK) response (UE-1 to SCC AS)**

```

SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>;
+g.3gpp.iut-controller
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=123.45.67.89
t=0 0
m=audio 1300 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1202 RTP/AVP 98 99
a=inactive
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**22-23. SIP ACK request (from SCC AS to UE-1)**

The SCC AS sends a SIP ACK request to the UE-1.

#### 24-26. SIP re-INVITE request (from SCC AS to remote UE)

The SCC AS sends a SIP re-INVITE request to the remote UE.

**Table A.11.3-24: SIP INVITE request (SCC AS to remote UE)**

```
INVITE sip:userR_public1@home2.net SIP/2.0
Via:
To: sip:userR_public1@home2.net;tag=27364
From: sip:user1_public1@home1.net;tag=11928
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: <sip:interUEtransfer@sccas1.home1.net>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
t=0 0
m=audio 1300 RTP/AVP 96 97
c=IN IP4 123.45.67.89
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
c=IN IP4 123.112.67.87
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

#### 27-29. SIP 200 (OK) response (from Remote UE to SCC AS)

The Remote UE acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC AS.

**Table A.11.3-27: SIP 200 (OK) response (Remote UE to SCC AS)**

```

SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Asserted-Identity:
Contact: sip:userR_public1@home2.net
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**30-32. SIP ACK request (from SCC AS to Remote UE)**

The SCC-AS sends a SIP ACK request to the Remote UE.

**33-34. SIP re-INVITE request (from SCC AS to UE-2)**

The SCC AS sends a SIP re-INVITE request to UE-2 to activate the video media component.

**Table A.11.3-33: SIP INVITE request (SCC AS to UE-2)**

```

INVITE sip:user1_public2@home1.net; gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222 SIP/2.0
Via: SIP/2.0/UDP sccas.home1.net; branch=z9hG4bK332b33.3;
To: sip:user1_public2@home1.net; tag=36527
From: sip:interUEtransfer@sccas1.home1.net; tag=27365
Call-ID: cb03a0s09a2sdfglkj22222
Cseq: 112 INVITE
Max-Forwards: 70
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net;+g.3gpp.iut-focus
Allow:
Accept:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**35-36. SIP 200 (OK) response (from UE-2 to SCC AS)**

The UE-2 sends a SIP 200 (OK) response to the SCC AS.

**Table A.11.3-35: SIP 200 (OK) response (UE-2 to SCC AS)**

```
SIP/2.0 200 OK
Via:
To: sip:user1_public2@home1.net; tag=36527
From: sip:interUEtransfer@sccas1.home1.net; tag=27365
Call-ID: cb03a0s09a2sdfglkj22222
CSeq:
P-Preferred-Identity:
Contact: <sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
c=123.112.67.87
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

### 37-38. SIP ACK request (from SCC AS to UE-2)

The SCC AS sends a SIP ACK request to the UE-2.

### 40-41. SIP re-INVITE request (from SCC AS to UE-1)

The SCC-AS sends a SIP re-INVITE request to the UE-1 to release the video media component.

**Table A.11.3-40: SIP INVITE request (SCC AS to UE-1)**

```
INVITE sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111 SIP/2.0
Via:
To: sip:user1_public1@home1.net;Tag=11928
From: sip:userR_public1@home2.net; tag=27364
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net;+g.3gpp.iut-focus
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 0 RTP/AVP 98 99
```

### 41-42. SIP 200 (OK) response (from UE-1 to SCC AS)

The UE-1 sends a SIP 200 (OK) response with an SDP answer.

**Table A.11.3-41: SIP 200 (OK) response (UE-1 to SCC AS)**

```
SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>;
+g.3gpp.iut-controller
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=123.45.67.89
t=0 0
m=audio 1300 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 0 RTP/AVP 98 99
```

**43-44. SIP ACK request (from SCC AS to UE-1)**

The SCC AS sends a SIP ACK request to the UE-1.

**45-46. SIP NOTIFY request (from SCC AS to UE-2)**

The SCC AS sends a SIP NOTIFY request including the SIP final response as a sipfrag body request to the UE-2.



Table A.11.3-45: SIP NOTIFY request (SCC AS to UE-2)

```

NOTIFY sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222 SIP/2.0
Via:
To:sip:user2_public1@home1.net;tag=1234
From:sip: sip:interUEtransfer@sccas1.home1.net;tag=3456
Call-ID:
CSeq:
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net
Allow:
Event:refer
Subscription-State:terminated; reason=noresource
Content-Type: message/sipfrag; version=2.0
Content-Length: (...)

SIP/2.0 200 OK
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>;+g.3gpp.iut-controller
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=123.45.67.89
t=0 0
m=audio 1300 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 0 RTP/AVP 98 99

```

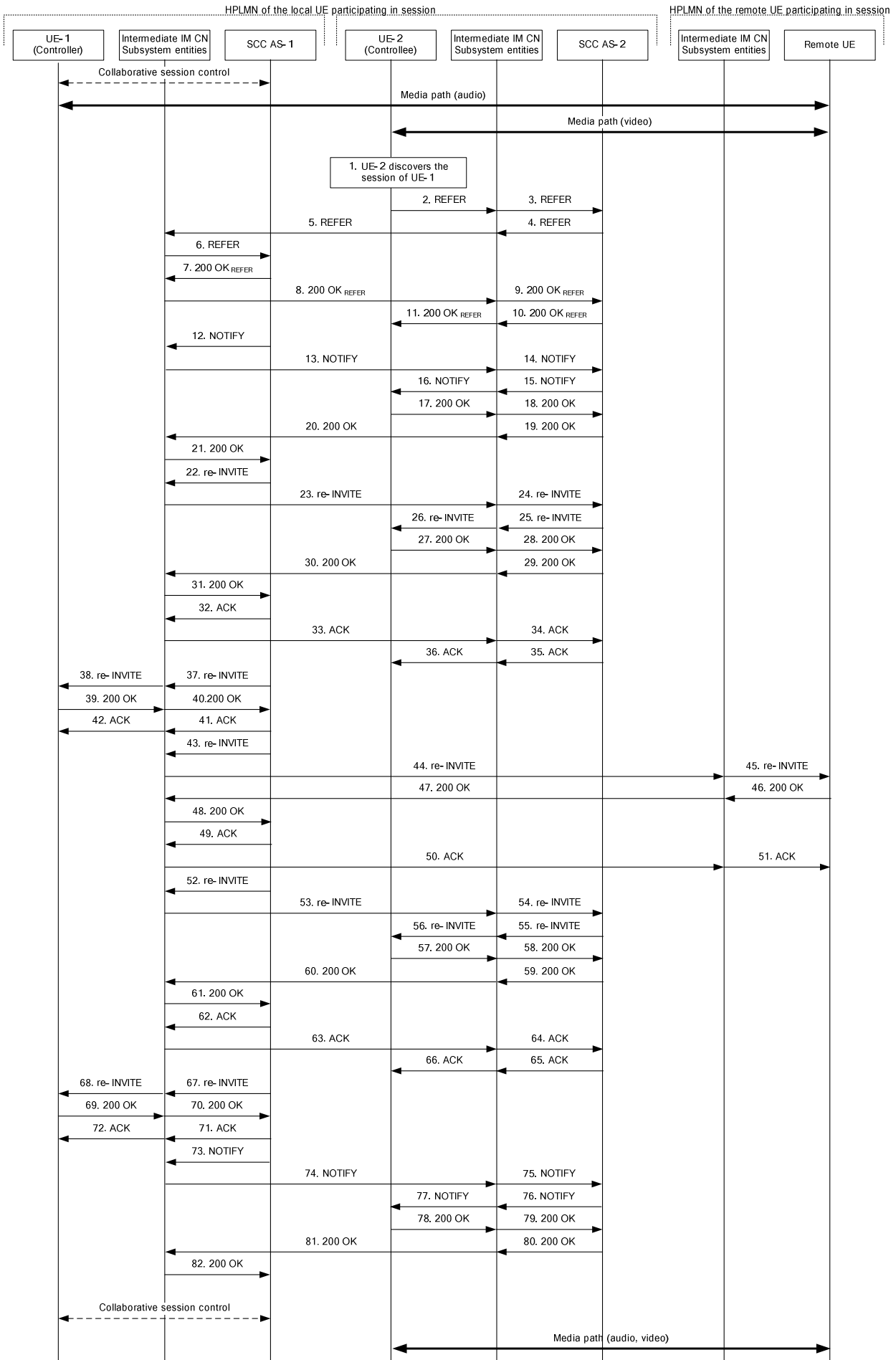
**47-48. SIP 200 (OK) response (from UE-2 to SCC AS)**

The UE-2 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS.

## A.11.4 Media flows transfer initiated by a controllee UE of an ongoing collaborative session

This subclause describes the scenario when the Media flow is transferred from Controller UE, UE-1 to Controllee UE, UE-2 requested by UE-2. The flow diagram shows when UE-1 and UE-2 belong to the different subscription.

UE-1 (123.45.67.89) and UE-2 (123.112.67.87) are included in a Collaborative Session with the remote UE (132.54.76.98), in which UE-1 is the Controller UE and UE-2 is the Controllee UE. The call is anchored in the SCC AS-1 controlling the collaborative session. Prior to transfer the Media flow, UE-2 gets the dialog information such as the content type and port numbers on the remote end. This is done by UE-2 having subscribed to dialog event package between UE-1 and the SCC AS-1.



### Figure A.11.4-1: Signalling flow for Media flows transfer initiated by a controllee UE of an ongoing collaborative session

#### 1. UE-2 discovers the session of UE-1

#### 2-6. SIP REFER request (from UE-2 to SCC AS serving UE-1)

The SIP REFER request contains a Refer-To header field containing a URI of Target UE, UE-2 and a body parameter containing an m line for audio to be pulled with the port number set to the non-zero port numbers use in the SDP parameter from the corresponding media descriptions as received during the last successful SDP offer-answer exchange from the Remote UE. The SIP REFER request also includes a Target-dialog header field containing the details of the dialog for the existing session between UE-1 and Remote-UE.

**Table A.11.4-2 SIP REFER request (UE-2 to SCC AS-1 serving UE-1)**

```
REFER sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111 SIP/2.0
Via: SIP/2.0/UDP [2222::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7dfdsdq
To: <sip: user1_public1@home1.net >
From: <sip:user2_public1@home2.net>;tag=294756
Call-ID: Asdasd23123366
Cseq: 4897924 REFER
Max-Forwards: 70
P-Preferred-Identity: <sip:user2_public1@home2.net>;
Refer-To: <sip:user2_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222?
  body=m%3DAudio%203000%20RTP%2FAVP%97%0Dm%3Dvideo%203002%20RTP%2FAVP%2098%2099>
Require: target-dialog
Target-dialog: cb03a0s09a2sdfglkj11111;remote-tag=27364;local-tag=11928
Referred-By: sip:user2_public1@home2.net
Contact: sip:user2_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222
Accept-Contact: * ;+g.3gpp.iut-focus;explicit;require
Accept: application/sdp, message/sipfrag
Content-Length: 0
```

#### 7-11. SIP 200 (OK) response (from SCC AS-1 serving UE-1 to UE-2)

The SCC AS-1 serving UE-1 sends a SIP 200 (OK) response to UE-2 as response to the SIP REFER request.

#### 12-16. SIP NOTIFY request (from SCC AS-1 serving UE-1 to UE-2)

The SCC AS-1 serving UE-1 sends a SIP NOTIFY request to UE-2 to notify implicit subscription to the SIP REFER request results.

**Table A.11.4-12: SIP NOTIFY request (SCC AS-1 serving UE-1 to UE-2)**

```
NOTIFYsip:user2_public1@home2.net; gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222 SIP/2.0
Via:
To:sip:user2_public1@home2.net;tag=1234
From:sip: sip:interUETRansfer@sccas1.home1.net;tag=3456
Call-ID:
CSeq:
P-Asserted-Identity:
Require:
Contact: sip:interUETRansfer@sccas1.home1.net;+g.3gpp.iut-focus
Allow:
Event:refer
Subscription-State:active; expires=3600
Content-Type: message/sipfrag; version=2.0
Content-Length: (...)

SIP/2.0 100 Trying
```

#### 17-21. SIP 200 (OK) response (from UE-2 to UE-1)

The UE-2 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the UE-1.

#### 22-26. SIP re-INVITE request (from SCC AS-1 serving UE-1 to UE-2)

Since the 2-6 SIP REFER request contains a Refer-to header field addressed to UE-2 and the URI parameters, listing an audio line which is not currently supported by UE-2, the SCC AS-1 realizes the procedure is for

transferring the media from that controller UE (UE-1) to UE-2. The SCC-AS-1 sends a SIP re-INVITE request to the UE-2, to transfer the audio media component.

**Table A.11.4-22 SIP INVITE request (SCC AS-1 serving UE-1 to UE-2)**

```
INVITE sip:user2_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222 SIP/2.0
Via: SIP/2.0/UDP sccas1.home1.example.net;branch=z9hG4bK332b33.3;
To: sip:user2_public1@home2.net;
From: sip:interUEtransfer@example.net;tag=27365
Call-ID: cb03a0s09a2sdfglkj22222
Cseq: 111 INVITE
Max-Forwards: 70
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@example.net;+g.3gpp.iut-focus
Allow:
Accept:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 97
a=sendonly
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

### 27-31. SIP 200 (OK) response (from UE-2 to SCC-AS-1 serving UE-1)

The target UE, UE-2, acknowledges the SIP INVITE request by sending a SIP 200 (OK) response to the SCC AS serving UE-1.

**Table A.11.4-27 SIP 200 (OK) response (UE-2 to SCC AS-1 serving UE-1)**

```

SIP/2.0 200 OK
Via:
To: sip:user2_public1@home2.net; tag=36527
From: sip:interUEtransfer@example.net; tag=27365
Call-ID: cb03a0s09a2sdfglkj22222
CSeq:
P-Preferred-Identity:
Contact: <sip:user2_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.23.45.87
s=-
c=123.23.45.87
t=0 0
m=audio 1300 RTP/AVP 97
a=inactive
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**32-36. SIP ACK request (from SCC AS-1 serving UE-1 to UE-2)**

The SCC AS-1 serving UE-1 sends a SIP ACK request to the UE-2.

**37-38. SIP re-INVITE request (from SCC AS-1 serving UE-1 to UE-1)**

The SCC AS-1 serving UE-1 sends a SIP re-INVITE request to the UE-1 to hold the video media session to be transferred.

**Table A.11.4-37 SIP INVITE request (SCC AS-1 serving UE-1 to UE-1)**

```

INVITE sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111 SIP/2.0
Via:
To: sip:user1_public1@home1.net;Tag=11928
From: sip:userR_public1@homeR.net; tag=27364
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@example.net;+g.3gpp.iut-focus
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 97
a=sendonly
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 0 RTP/AVP 98 99

```

**39-40. SIP 200 (OK) response (from UE-1 to SCC AS serving UE-1)**

The UE-1 sends a SIP 200 (OK) response with an SDP answer.

**Table A.11.4-39 SIP 200 (OK) response (UE-1 to SCC AS-1 serving UE-1)**

```
SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>;
+g.3gpp.iut-controller
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=123.45.67.89
t=0 0
m=audio 1200 RTP/AVP 97
a=inactive
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 0 RTP/AVP 98 99
```

**41-42. SIP ACK request (from SCC AS-1 serving UE-1 to UE-1)**

The SCC AS serving UE-1 sends a SIP ACK request to the UE-1.

**43-45. SIP re-INVITE request (from SCC AS-1 serving UE-1 to remote UE)**

The SCC AS-1 serving UE-1 sends a SIP re-INVITE request to the remote UE.

**Table A.11.4-45 SIP INVITE request (SCC AS-1 serving UE-1 to remote UE)**

```
INVITE sip:userR_public1@homeR.net SIP/2.0
Via:
To: sip:userR_public1@homeR.net;tag=27364
From: sip:user1_public1@home1.net;tag=11928
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: <sip:interUEtransfer@example.net>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
t=0 0
m=audio 1300 RTP/AVP 96 97
c=IN IP4 123.112.67.87
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
c=IN IP4 123.112.67.87
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

**46-48. SIP 200 (OK) response (from Remote UE to SCC AS-1 serving UE-1)**

The Remote UE acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC AS-1 serving UE-1.

**Table A.11.4-46 SIP 200 (OK) response (Remote UE to SCC AS-1 serving UE-1)**

```
SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Asserted-Identity:
Contact: sip:userR_public1@homeR.net
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

**49-51. SIP ACK request (from SCC AS serving UE-1 to Remote UE)**

The SCC-AS serving UE-1 sends a SIP ACK request to the Remote UE.

**52-56. SIP re-INVITE request (from SCC AS serving UE-1 to UE-2)**

The SCC AS serving UE-1 sends a SIP re-INVITE request to UE-2 to activate the video media component.

**Table A.11.4-52 SIP INVITE request (SCC AS-1 serving UE-1 to UE-2)**

```

INVITE sip:user2_public1@home2.net; gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222 SIP/2.0
Via: SIP/2.0/UDP sccas1.home1.example.net; branch=z9hG4bK332b33.3;
To: sip:user2_public1@home2.net; tag=36527
From: sip:interUEtransfer@example.net; tag=27365
Call-ID: cb03a0s09a2sdfglkj22222
Cseq: 112 INVITE
Max-Forwards: 70
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@example.net;+g.3gpp.iut-focus
Allow:
Accept:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**57-61. SIP 200 (OK) response (from UE-2 to SCC AS-1 serving UE-1)**

The UE-2 sends a SIP 200 (OK) response to the SCC AS serving UE-1.

**Table A.11.4-57 SIP 200 (OK) response (UE-2 to SCC AS-1 serving UE-1)**

```

SIP/2.0 200 OK
Via:
To: sip:user2_public1@home2.net; tag=36527
From: sip:interUEtransfer@example.net; tag=27365
Call-ID: cb03a0s09a2sdfglkj22222
CSeq:
P-Preferred-Identity:
Contact: <sip:user2_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.23.45.87
s=-
c=123.23.45.87
t=0 0
m=audio 1300 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**62-66. SIP ACK request (from SCC AS-1 serving UE-1 to UE-2)**

The SCC AS serving UE-1 sends a SIP ACK request to the UE-2.



**67-68. SIP re-INVITE request (from SCC AS-1 serving UE-1 to UE-1)**

The SCC-AS serving UE-1 sends a SIP re-INVITE request to the UE-1 to release the video media component.

**Table A.11.4-67 SIP INVITE request (SCC AS-1 serving UE-1 to UE-1)**

```

INVITE sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111 SIP/2.0
Via:
To: sip:user1_public1@home1.net;Tag=11928
From: sip:userR_public1@homeR.net; tag=27364
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@example.net
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 0 RTP/AVP 98 99

```

**69-70. SIP 200 (OK) response (from UE-1 to SCC AS-1 serving UE-1)**

The UE-1 sends a SIP 200 (OK) response with an SDP answer.

**Table A.11.4-69 SIP 200 (OK) response (UE-1 to SCC AS-1 serving UE-1)**

```

SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>;
+g.3gpp.iut-controller
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=123.45.67.89
t=0 0
m=audio 0 RTP/AVP 97
m=video 0 RTP/AVP 98 99

```

**71-72. SIP ACK request (from SCC AS-1 serving UE-1 to UE-1)**

The SCC AS serving UE-1 sends a SIP ACK request to the UE-1.

**73-77. SIP NOTIFY request (from SCC AS-1 serving UE-1 to UE-2)**

The SCC AS serving UE-1 sends a SIP NOTIFY request including the SIP final response as a sipfrag body to the UE-2 to inform about success status of transferring the media from UE-1 to the UE-2.

**Table A.11.4-73: SIP NOTIFY request (SCC AS-1 serving UE-1 to UE-2)**

```

NOTIFY sip:user2_public1@home2.net; gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222 SIP/2.0
Via:
To:sip:user2_public1@home2.net;tag=1234
From:sip: sip:interUEtransfer@sccas1.home1.net;tag=3456
Call-ID:
CSeq:
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net;+g.3gpp.iut-focus
Allow:
Event:refer
Subscription-State:terminated; reason=noresource
Content-Type: message/sipfrag; version=2.0
Content-Length: (...)

SIP/2.0 200 OK
Contact: <sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>;
+g.3gpp.iut-controller
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
c=123.45.67.89
t=0 0
m=audio 0 RTP/AVP 97
m=video 0 RTP/AVP 98 99

```

**78-82. SIP 200 (OK) response (from UE-2 to SCC AS-1 serving UE-1)**

The UE-2 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS-1 serving UE-1.

## A.11.5 Controllee UE initiated addition of media to another controllee UE

This subclause describes the scenario when controllee UE, UE-2 initiate addition of a media to another controllee UE, UE-3. The flow diagram shows when UE-1 and UE-2, UE-3 belong to the different subscription.

Note: When UE-1 and UE-2, UE-3 belong to the same subscription, Serving SCC AS of UE-1, UE-2 and UE-3 are same.

UE-1(123.45.67.89), UE-2 (123.112.67.87) and UE-3(123.23.45.67) are included in a Collaborative Session with the remote UE (132.54.76.98), in which UE-1 is the controller UE and UE-2 and UE-3 are the controllee UEs. The Collaborative Session is controlled by SCC AS-1. Media paths exist between UE-2 and remote UE (audio) and between UE-3 and remote UE (video). The UE-2(123.23.45.67) wants to add another media flow between UE-3 and remote UE (video).

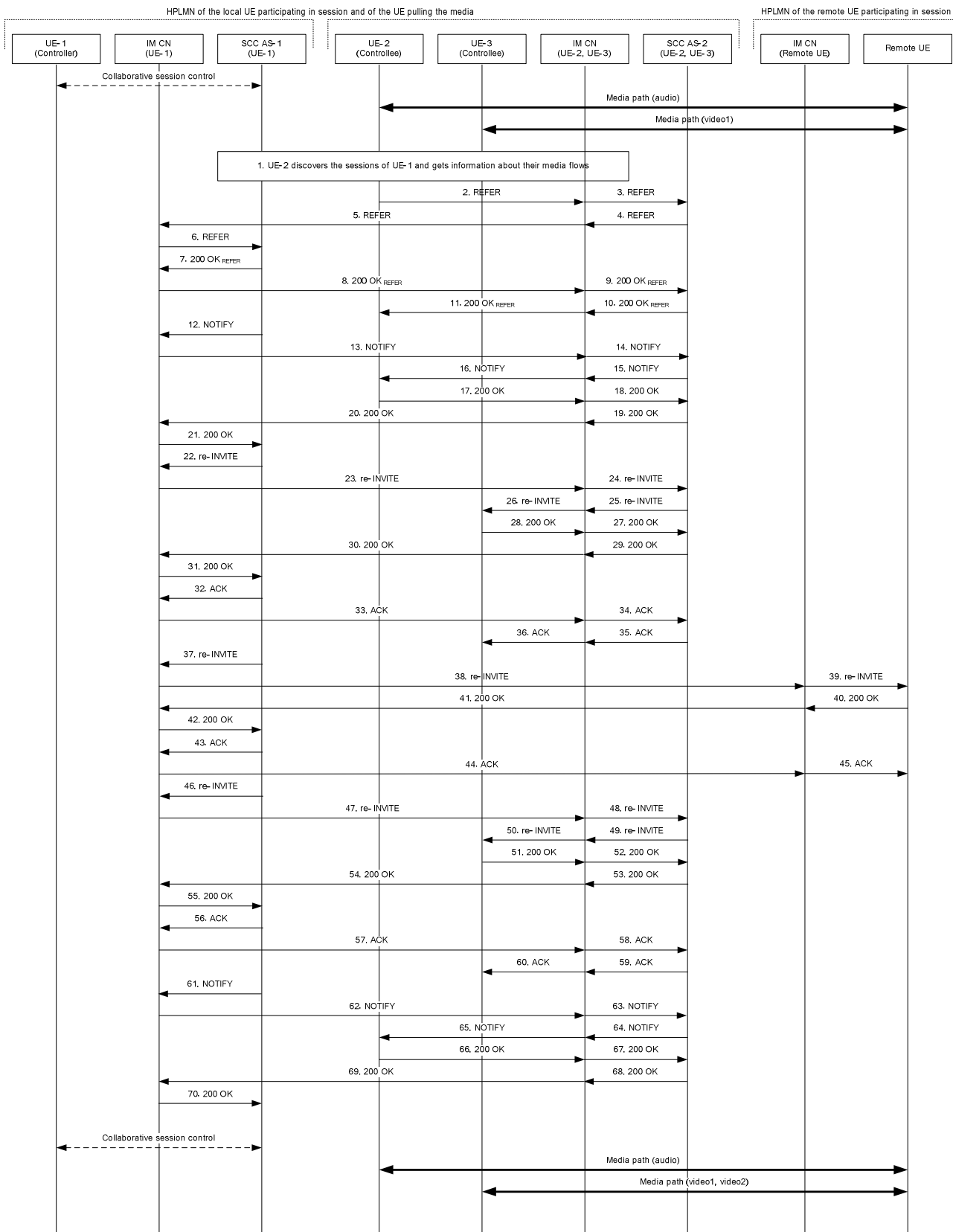


Figure A.11.5-1: Signalling flow for controllee UE initiated addition of media to another controllee UE

1. UE-2 discovers the information of the collaborative session.

2-6. SIP REFER request (from UE-2 to UE-1)

The UE-2 sends SIP REFER request to the controller UE, UE-1 to request addition of media to UE-3. The SIP REFER request is finally routed to the SCC AS-1 serving UE-1.

**Table A.11.5-2: SIP REFER request (UE-2 to UE-1)**

```
REFER sip:user1_public1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111 SIP/2.0
Via: SIP/2.0/UDP [3333::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7dfdsdq
To: <sip:user1_public1@home1.net>
From: <sip:user2_public1@home2.net>;tag=294756
Call-ID: Asdasd23123366
Cseq: 4897924 REFER
Max-Forwards: 70
P-Preferred-Identity: <sip:user2_public1@home2.net>;
Refer-To: <sip:user1_public3@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333?body=
m%3DAudio%20%20RTP%2FAVP%97%0Dm%3Dvideo%203002%20RTP%2FAVP%2098%2099%3E
m%3Dvideo%20%20RTP%2FAVP%2098%2099>
Referred-By: sip:user2_public1@home2.net
Target-dialog: cb03a0s09a2sdfglkj11111;remote-tag=27364;local-tag=11928
Contact: sip:user2\_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222
Referred-By: sip:user2_public1@home2.net
Accept: application/sdp, message/sipfrag
Content-Length: 0
```

#### 7-11. SIP 200 (OK) response (from SCC AS-1 serving UE-1 to UE-2)

SCC AS-1 serving UE-1 sends a SIP 200 (OK) response to UE-2 as response to the SIP REFER request.

#### 12-16. SIP NOTIFY request (from SCC AS-1 serving UE-1 to UE-2)

The SCC AS-1 serving UE-1 sends a SIP NOTIFY request to UE-2 to notify implicit subscription to the SIP REFER request results.

**Table A.11.5-12: SIP NOTIFY request (SCC AS-1 serving UE-1 to UE-2)**

```
NOTIFY sip:user2\_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222 SIP/2.0
Via:
To: sip:user2_public1@home2.net;tag=1234
From: sip: sip:interUETransfer@sccas1.home1.net;tag=3456
Call-ID:
CSeq:
P-Asserted-Identity:
Require:
Contact: sip:interUETransfer@sccas1.home1.net
Allow:
Event: refer
Subscription-State: active; expires=3600
Content-Type: message/sipfrag; version=2.0
Content-Length: (...)

SIP/2.0 100 Trying
```

#### 17-21. SIP 200 (OK) response (from UE-2 to SCC AS-1 serving UE-1)

The UE-2 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS-1 serving UE-1.

#### 22-26. SIP re-INVITE request (from SCC AS-1 serving UE-1 to UE-3)

Since the message 2-6 contains a Refer-to header field addressed to UE-3 and the URI parameters, listing an audio line which is not currently supported by UE-3, the SCC AS realizes the procedure is for adding the media to UE-3. The SCC AS-1 serving UE-1 sends a SIP re-INVITE request to the UE-3, to add the video media component.

**Table A.11.5-22: SIP INVITE request (SCC AS-1 serving UE-1 to UE-3)**

```

INVITE sip:user3_public1@home2.net; gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333 SIP/2.0
Via: SIP/2.0/UDP sccas1.home1.net; branch=z9hG4bK332b33.3;
To: sip:user3_public1@home2.net;
From: sip:interUEtransfer@home.net; tag=12486
Call-ID: cb03a0s09a2sdfglkj33333
Cseq: 115 INVITE
Max-Forwards: 70
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net;+g.3gpp.iut-focus
Allow:
Accept:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=video 9 RTP/AVP 98 99
a=sendonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**27-31. SIP 200 (OK) response (from UE-3 to SCC AS-1 serving UE-1)**

The target UE, UE-3, acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC AS-1 serving UE-1.

**Table A.11.5-27: SIP 200 (OK) response (UE-3 to SCC AS-1 serving UE-1)**

```

SIP/2.0 200 OK
Via:
To: sip:user3_public1@home2.net; tag = 24861
From: sip:interUEtransfer@home.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: <sip:user3_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.23.45.67
s=-
c=123.23.45.67
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=video 1304 RTP/AVP 98 99
a=recvonly
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**32-36. SIP ACK request (from SCC AS-1 serving UE-1 to UE-3)**

The SCC AS-1 serving UE-1 sends a SIP ACK request to the UE-3.

#### 37-39. SIP re-INVITE request (from SCC AS-1 serving UE-1 to remote UE)

The SCC AS-1 serving UE-1 sends a SIP re-INVITE request to the remote UE.

**Table A.11.5-37 SIP INVITE request (SCC AS-1 serving UE-1 to remote UE)**

```
INVITE sip:user4_public1@home2.net SIP/2.0
Via:
To: sip:user4_public1@home2.net;tag=27364
From: sip:user1_public1@home1.net;tag=11928
Call-ID: cb03a0s09a2sdfglkj11111
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: <sip:interUetransfer@sccas1.home1.net>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.45.67.89
s=-
t=0 0
m=audio 1300 RTP/AVP 96 97
c=IN IP4 123.112.67.87
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 1302 RTP/AVP 98 99
c=IN IP4 123.23.45.67
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=video 1304 RTP/AVP 98 99
c=IN IP4 123.23.45.67
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

#### 40-42. SIP 200 (OK) response (from remote UE to SCC AS-1 serving UE-1)

The remote UE acknowledges the SIP re-INVITE request by sending a SIP 200 (OK) response to the SCC AS -1 serving UE-1.

**Table A.11.5-40: SIP 200 (OK) response (remote UE to SCC AS-1 serving UE-1)**

```
SIP/2.0 200 OK
Via:
To:
From:
Call-ID:
CSeq:
P-Asserted-Identity:
Contact: sip:user4_public1@home2.net
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 3000 RTP/AVP 97
b=AS:25.4
a=rtpmap:96 AMR
a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
a=rtpmap:97 telephone-event
a=maxptime:20
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=video 3004 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

**43-45. SIP ACK request (from SCC AS-1 serving UE-1 to remote UE)**

The SCC AS-1 serving UE-1 sends a SIP ACK request to the remote UE.

**46-50. SIP re-INVITE request (from SCC AS-1 serving UE-1 to UE-3)**

The SCC AS-1 serving UE-1 sends a SIP re-INVITE request to the controllee UE.

**Table A.11.5-46: SIP INVITE request (SCC AS-1 serving UE-1 to UE-3)**

```

INVITE sip:user3_public1@home2.net; gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333 SIP/2.0
Via: SIP/2.0/UDP sccas.home1.net; branch=z9hG4bK332b33.3;
To: sip:user3_public1@home2.net;
From: sip:interUEtransfer@sccas1.home1.net; tag=12486
Call-ID: cb03a0s09a2sdfglkj33333
Cseq: 111 INVITE
Max-Forwards: 70
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net;+g.3gpp.iut-focus
Allow:
Accept:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=video 3004 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**51-55. SIP 200 (OK) response (from UE-3 to SCC AS-1 serving UE-1)**

The UE-3 sends a SIP 200 (OK) response with an SDP answer.

**Table A.11.5-51: SIP 200 (OK) response (UE-3 to SCC AS-1 serving UE-1)**

```

SIP/2.0 200 OK
Via:
To: sip:user3_public1@home3.net; tag = 24861
From: sip:interUEtransfer@home.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: <sip:user3_public1@home3.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333>
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.23.45.67
s=-
c=123.23.45.67
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=video 1304 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

```

**56-60. SIP ACK request (from SCC AS-1 serving UE-1 to UE-3)**

The SCC AS-1 serving UE-1 sends a SIP ACK request to the UE-3.



**61-65. SIP NOTIFY request (from SCC AS-1 serving UE-1 to UE-2)**

The SCC AS-1 sends a SIP NOTIFY request including the SIP final response as a sipfrag body to UE-2 to inform about the success status of adding media to UE-3.

**Table A.11.5-61: SIP NOTIFY request (SCC AS-1 serving UE-1 to UE-2)**

```
NOTIFY sip:user2_public1@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-222222222222 SIP/2.0
Via:
To:sip:user2_public1@home2.net;tag=1234
From:sip: sip:interUEtransfer@sccas1.home1.net;tag=3456
Call-ID:
CSeq:
P-Asserted-Identity:
Require:
Contact: sip:interUEtransfer@sccas1.home1.net;+g.3gpp.iut-focus
Allow:
Event:refer
Subscription-State:terminated; reason=noresource
Content-Type: message/sipfrag; version=2.0
Content-Length: (...)

SIP/2.0 200 OK
Contact: <sip:user3_public1@home3.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-333333333333>
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 123.23.45.67
s=-
c=123.23.45.67
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
m=video 1304 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

**66-70. SIP 200 (OK) response (from UE-2 to SCC AS-1 serving UE-1)**

The UE-2 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to the SCC AS-1 serving UE-1.

---

## A.12 Signalling flows for session replication / media replication performed by the SCC AS

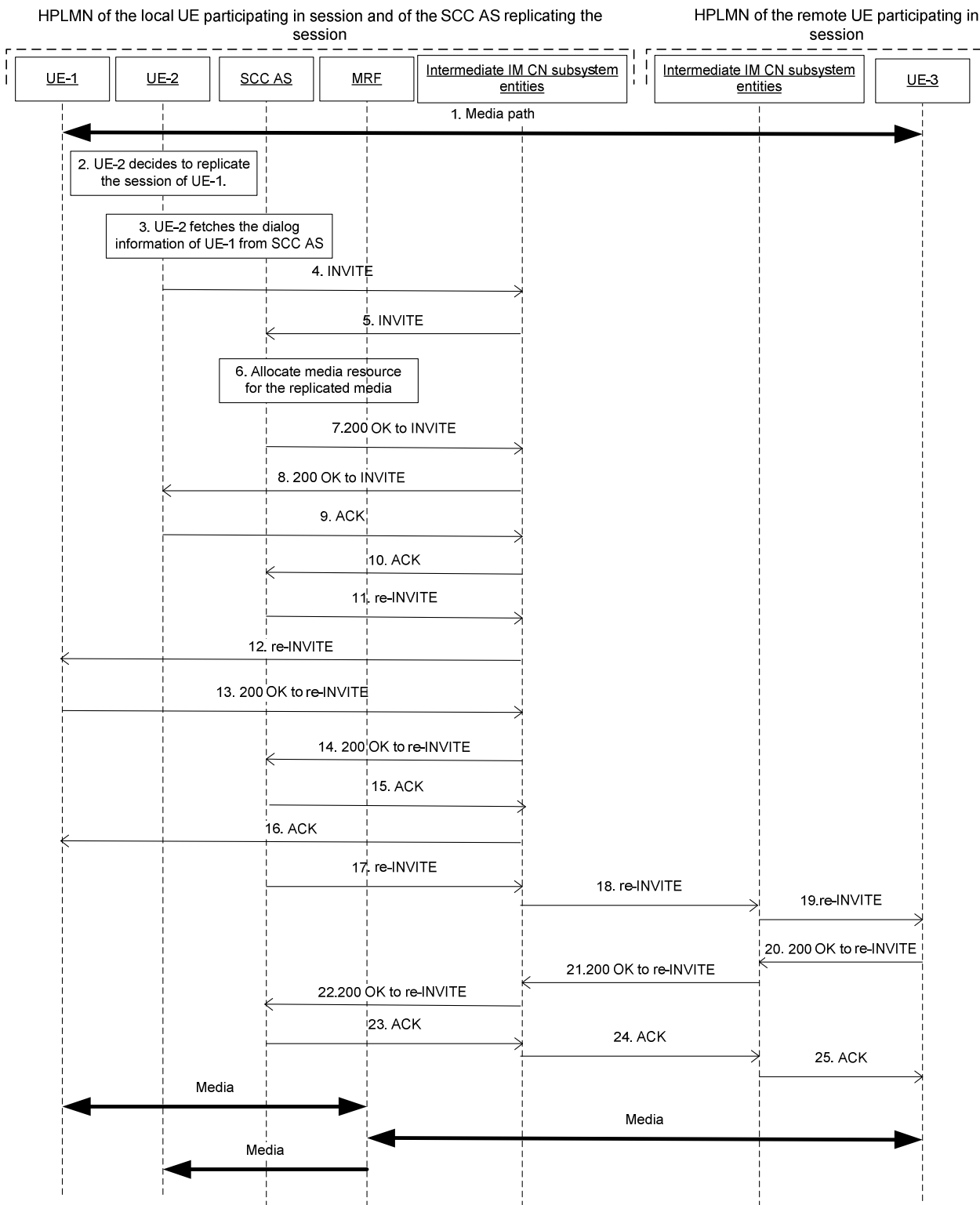
### A.12.1 Introduction

The signalling flows for session replication/media replication performed by the SCC AS demonstrate how the session is replicated by the SCC AS. The following signalling flows are included:

- subclause A.12.2 shows an example using the pull mode; and
- subclause A.12.3 shows an example using the push mode.

## A.12.2 Signalling flows for session replication / media replication performed by the SCC AS – pull mode

In the example flow of figure A.12.2-1, UE-1 has an ongoing multimedia session with UE-3 anchored at the SCC AS. After successful replication, the media flow between UE-1 and UE-3 is not impacted. The replicated media component(s) are sent towards UE-2. UE-2 cannot send media flows towards UE-1 or UE-3 during this session.



**Figure A.12.2-1: Signalling flows for session replication by SCC AS from controller to another UE - pull mode**

NOTE: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

**1. UE-1 is in session with UE-3**

There is a multimedia session comprising audio and video media between UE-1 and the remote UE-3 anchored at the SCC AS.

2. UE-2 decides to replicate the session from UE-1 to UE-2.
3. UE-2 fetches the dialog information of UE-1 from SCC AS.
- 4-5. SIP INVITE request (UE-2 to UE-1) - see example in table A.12.2-4

UE-2 sends a SIP INVITE request to UE-1 to perform the session replication.

**Table A.12.2-4: SIP INVITE request (UE-2 to Intermediate IM CN subsystem entities)**

```
INVITE sip:user1@example.net; SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:eee]:1357;comp=sigcomp;branch=z9hG4bKnashds7dfdsdq
Max-Forwards: 70
P-Preferred-Identity: <sip:user2@home1.net>
From: <sip:user2@home1.net>;tag=171828
To: <sip:user1transfer@example.net>
Call-ID: Asdasd23123366
Cseq: 41277 INVITE
Contact: <sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222>
Accept-Contact:+g.3gpp.iut-focus;explicit;require
Target-dialog: cb03a0s09a2sdfglkj11111;remote-tag=27364;local-tag=11928
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 4444::aaa:bbb:ccc:eee
s=-
c=IN IP6 4444::aaa:bbb:ccc:eee
t=0 0
m=audio 4444 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 6666 RTP/AVP 98
a=rtpmap:98 MPV/90000
a=3gpp.iut.replication
```

The SDP attribute "a=3gpp.iut.replication" indicates that the replication request is sent from the controllee UE and it uses the network based solution.

6. SCC AS sends information to MRF to allocate the media resource for the media to be replicated.

- 7-8. SIP 200 (OK) response for the SIP INVITE request (SCC AS to UE-2)

The SCC AS responds with a SIP 200 (OK) response to UE-2.

- 9-10. SIP ACK request (UE-2 to SCC AS)

UE-2 sends a SIP ACK request to the SCC AS.

- 11-12. SIP re-INVITE request (SCC-AS to UE-1) - see example in table A.12.2-11

The SCC AS updates the access leg on Controller UE-1 for the replicated media flow with the MRF.

**Table A.12.2-11: SIP re-INVITE request (SCC AS to Intermediate IM CN subsystem entities)**

```
INVITE sip:user1@home1.net; SIP/2.0
Via: SIP/2.0/UDP
Max-Forwards:
P-Preferred-Identity:
From: <sip:interUEtransfer@example.net>;tag=171828
To: <sip:user1@home1.net>;tag=297786
Call-ID:
Cseq: 41278 INVITE
Contact:
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 4444::aaa:bbb:ccc:fff
s=-
```

```

c=IN IP6 4444::aaa:bbb:ccc:fff
t=0 0
m=audio 4444 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 6666 RTP/AVP 98
a=rtpmap:98 MPV/90000
a=3gpp.iut.replication

```

### 13-14. SIP 200 (OK) response to re-INVITE request (UE-1 to SCC AS) - see example in table A.12.1-13

After successful media update, UE-1 sends a SIP 200 (OK) response towards the SCC AS.

**Table A.12.3-13: SIP 200 (OK) response (UE-1 to Intermediate IM CN subsystem entities)**

```

SIP/2.0 200 OK
Via:
Max-Forwards:
P-Preferred-Identity:
From: <sip:interUEtransfer@example.net>;tag=171828
To: <sip:user1@home1.net>; tag=297786
Call-ID:
Cseq:
Contact:
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 4444::aaa:bbb:ccc:fff
s=-
c=IN IP6 4444::aaa:bbb:ccc:fff
t=0 0
m=audio 4444 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 6666 RTP/AVP 98
a=rtpmap:98 MPV/90000
a=3gpp.iut.replication

```

### 15-16. SIP ACK request (SCC AS to UE-1)

The SCC AS sends a SIP ACK request to UE-1.

### 17-18. SIP re-INVITE request (SCC AS to UE-3)

The SCC AS sends a SIP re-INVITE request towards the remote UE to update the remote leg to communicate media with the MRF.

### 20-22. SIP 200 (OK) response to re-INVITE request (UE-3 to SCC AS)

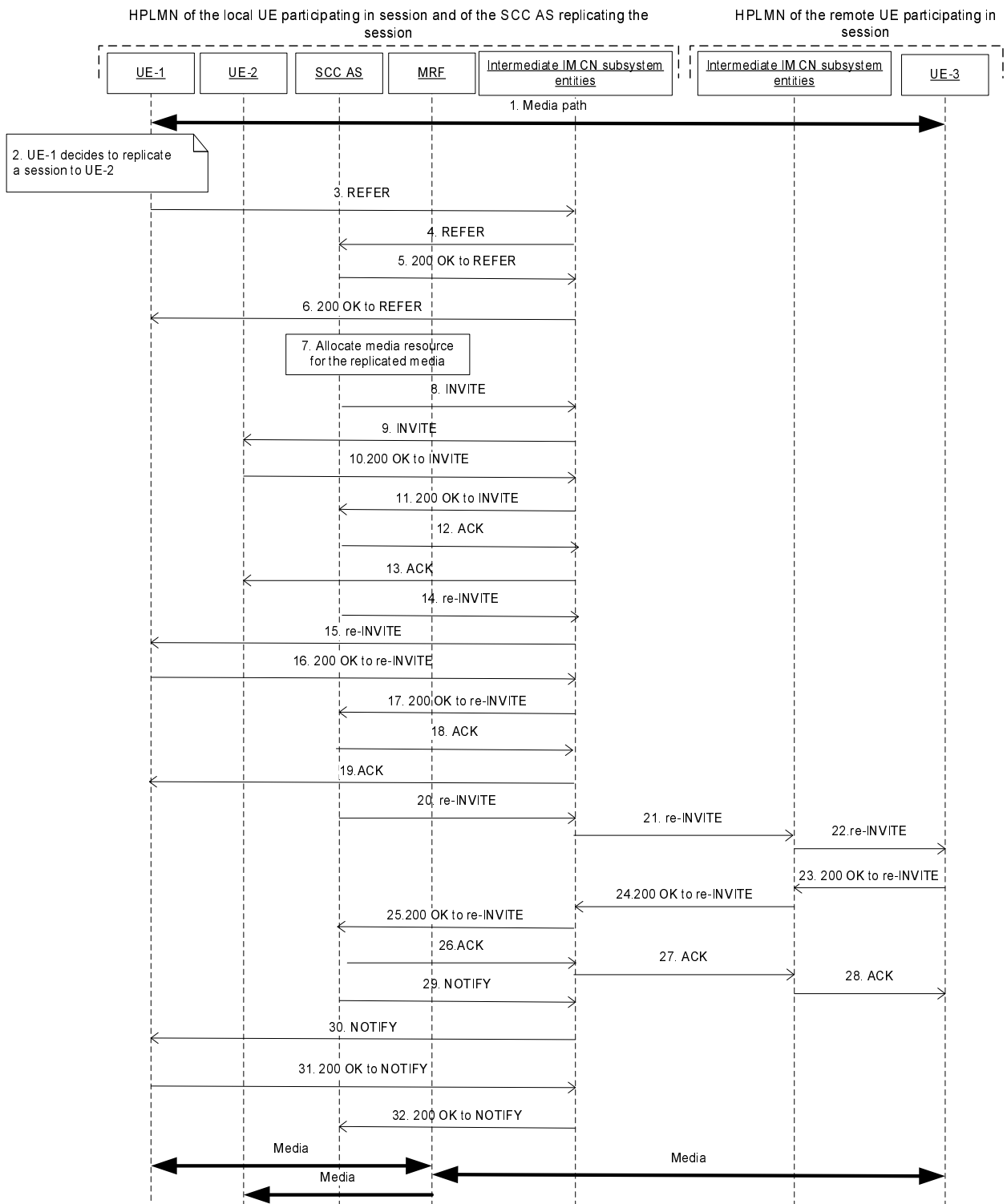
After successful media update, remote UE-3 sends a SIP 200 (OK) response towards the SCC AS.

### 23-25. SIP ACK request (SCC AS to UE-3)

The SCC AS sends a SIP ACK request to remote UE-3.

## A.12.3 Signalling flows for session replication / media replication performed by the SCC AS – push mode

In the example flow of figure A.12.3-1, UE-1 has an ongoing multimedia session with UE-3 anchored at the SCC AS. After successful replication, the media flow between UE-1 and UE-3 is not impacted. The replicated media component(s) are sent towards UE-2. UE-2 cannot send media flows towards UE-1 or UE-3 during this session.



**Figure A.12.3-1: Signalling flow for replicating media in network from controller to another UE- push mode**

NOTE: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

**1. UE-1 is in session with UE-3**

There is a multimedia session comprising audio and video media between UE-1 and the remote UE-3 anchored at the SCC AS.

**2. UE-1 decides to replicate the session from UE-1 to UE-2.**

**3-4. SIP REFER request (UE-1 to SCC AS) - see example in table A.12.3-3**

UE-1 sends a SIP REFER request to the SCC AS to request the session replication. When the SCC AS receives the SIP REFER request, the SCC AS authorizes the request.

**Table A.12.3-3: SIP REFER request (UE-1 to Intermediate IM CN subsystem entities)**

```
REFER sip:interUEtransfer@example.net; SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7dfdsdq
Max-Forwards: 70
P-Preferred-Identity: <sip:user1@home1.net>
From: <sip:user1@home1.net>;tag=171828
To: <sip:user2@home1.net; >
Call-ID: Asdasd23123366
Cseq: 41277 REFER
Contact: <sip:user1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>
Accept-Contact:+g.3gpp.iut-focuss;explicit;require
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Refer-To: <sip:user3@home1.net?;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6?body=
m%3Dvedio%209%20RTP%2FAVP%98%0Dm% a=3gpp.iut.replication>
Referred-by: sip:user1@home1.net
Target-dialog: cb03a0s09a2sdfg1kj11111;remote-tag=27364;local-tag=11928
Content-Type: application/
Content-Length: (...)
```

The SDP attribute "The SDP attribute "a= 3gpp.iut.replication" indicates that the replication request was sent from the controller UE and it uses the network based solution.

**5-6. SIP 200 (OK) response for the SIP REFER request (SCC AS to UE-1)****7. SCC AS sends information to MRF to allocate the media resource for the media to be replicated.**

**Editor's Note:** There is a need to understand what functionality the MRF is providing. This can either be done by showing the instructions to the MRF or by showing the SDP in other messages thus enabling the activity of the MRF to be seen.

**8-9. SIP INVITE request (SCC AS to UE-2) - See example in table A.12.3-8**

The SCC AS sends a SIP INVITE request towards UE-2 to establish a session based on the information provided in the SIP REFER request.

**Table A.12.3-8: SIP INVITE request (SCC AS to UE-2)**

```
INVITE sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222 SIP/2.0
Via: SIP/2.0/UDP
Max-Forwards: 70
From: <sip:user1@home1.net>;tag=171828
To: <sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222>
Referred-By: sip: user1@example1.net
Call-ID: duie4hr3896
Cseq: 41 INVITE-
Contact: <sip:user1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>
Accept-Contact:+g.3gpp.iut-focus;explicit;require
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Length: 0
Content-Type: application/sdp
Content-Length: (...)
```

```
v=0
o=- 2987933615 2987933615 IN IP6 4444::aaa:bbb:ccc:eee
s=-
c=IN IP6 4444::aaa:bbb:ccc:eee
t=0 0
m=audio 4444 RTP/AVP 97
a=rtpmap:97 PCMU/8000
m=video 6666 RTP/AVP 98
a=rtpmap:98 MPV/90000
a=g.3gpp.iut.replication
```

The SCC AS adds the Referred-By header in order to indicate to UE-2 that this collaborative session request was triggered by UE-1.

The SDP attribute "a=3gpp.iut.replication" indicates that the replication request is sent by the SCC AS and it uses the network based solution.

#### **10-11. SIP 200 (OK) response to SIP INVITE request (UE-2 to SCC AS)**

UE-2 establishes the session by sending a SIP 200 (OK) response towards the SCC AS.

#### **12-13. SIP ACK request (SCC AS to UE-2)**

The SCC AS sends a SIP ACK request to UE-2.

#### **14-15. SIP re-INVITE request (SCC AS to UE-1)**

The SCC AS updates the access leg on Controller UE-1 for the replicated media flow with the MRF.

#### **16-17. SIP 200 (OK) response to re-INVITE request (UE-1 to SCC AS)**

After successful media update, UE-1 sends a SIP 200 (OK) response towards the SCC AS.

#### **18-19. SIP ACK request (SCC AS to UE-1)**

The SCC AS sends a SIP ACK request to UE-1.

#### **20-22. SIP re-INVITE request (SCC AS to UE-3)**

The SCC AS sends a SIP re-INVITE request towards the remote UE to update the remote leg to communicate media with the MRF.

#### **23-25. SIP 200 (OK) response to re-INVITE request (UE-3 to SCC AS)**

After successful media update, UE-3 sends a SIP 200 (OK) response towards the SCC AS.

#### **26-27. SIP ACK request (SCC AS to UE-3)**

The SCC AS sends a SIP ACK request to remote UE-3.

#### **29-30. SIP NOTIFY request (SCC AS to UE-1)**

The SCC AS informs UE-1 that the action triggered by the SIP REFER request was successfully completed.

#### **31-32. SIP 200 (OK) response to SIP NOTIFY request (UE-1 to SCC AS)**

UE-1 confirms the SIP NOTIFY request by sending a SIP 200 (OK) response to the SIP NOTIFY request.

---

## **A.13 Signalling flows for session replication / media replication performed by the remote UE**

### **A.13.1 General**

The signalling flows in the subclause demonstrate how session replication / media replication performed by remote UE can be applied on a session.



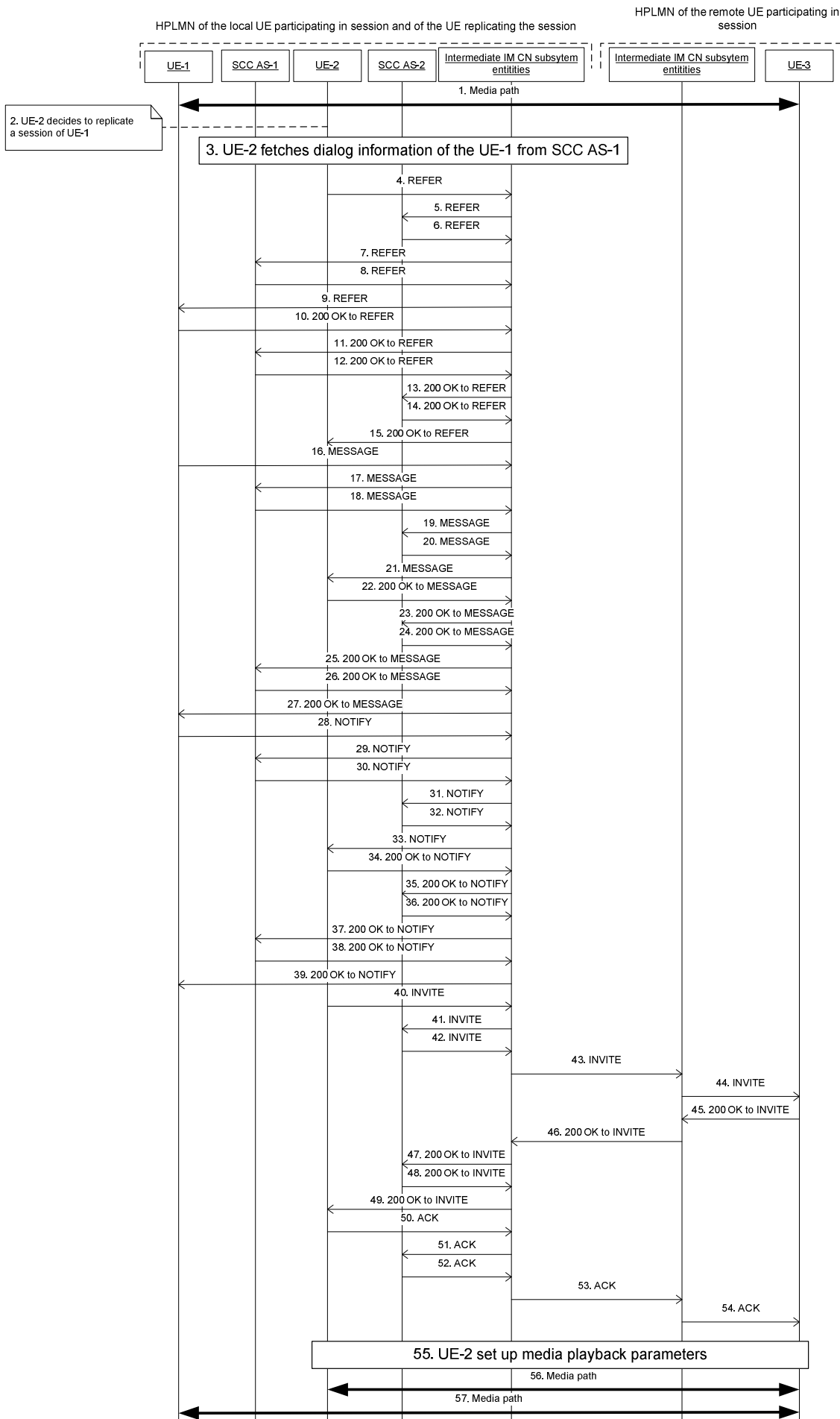
## A.13.2 Signalling flows for session replication / media replication performed by the remote UE – pull mode

### A.13.2.1 Introduction

The signalling flows in the subclause demonstrate how pull mode session replication / media replication performed by remote UE can be applied on a session.

### A.13.2.2 Pull mode session replication

In the example flow at the figure A.13.2.2-1, UE-1 has an ongoing multimedia session with UE-3 anchored at SCC AS-1. The session is established using an IMS communication service identified by ICSI urn:urn-7:3gpp-service.ims.icsi.iptv. UE-1 and UE-2 belong to different subscribers. UE-3 is an application server acting as a terminating UE.



### Figure A.13.2.2-1: Signalling flow for session replication in the remote UE – Pull mode

NOTE 1: For clarity, the SIP 100 (Trying) messages and SIP NOTIFY with SIP 100 (Trying) are not shown in the signalling flow.

#### 1. UE-1 is in session with UE-3

There is a multimedia session comprising audio and video media between the UE-1 and the remote UE-3 anchored at SCC AS-1. The session was established using IMS communication service identified by ICSI urn:urn-7:3gpp-service.ims.icsi.iptv. The dialog identifier of the session between SCC AS-1 and UE-1 is AB03a0s09a2sdfglkj490333, remote-tag=dfg45, local-tag=444.

#### 2. UE-2 decides to replicate the session of UE-1 to UE-2.

#### 3. UE-2 fetches the dialog information of the UE-1 from SCC AS-1.

#### 4-9. SIP REFER request (UE-2 to UE-1) - see example in table A.13.2.2-4

The UE-2 sends SIP REFER request to UE-1 to request the playback state. When SCC AS-1 forwards the SIP REFER request, the SCC AS-1 authorizes the request.

**Table A.13.2.2-4: SIP REFER request**

```
REFER sip:user1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111 SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:fff]:1357;comp=sigcomp;branch=z9hG4bKnashds7
Max-Forwards: 70
P-Preferred-Identity: <sip:user2@home1.net>
From: <sip:user2@home1.net>;tag=171828
To: <sip:user1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>
Call-ID: ddfqtq34gasgaegr
Cseq: 1112 REFER
Contact: <sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/vnd.3gpp.replication+xml
Content-Length: (...)
Supported: 100rel, precondition
Refer-To: <sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222;method=MESSAGE?In-Reply-To=ddfqtq34gasgaegr>
Target-Dialog: AB03a0s09a2sdfglkj490333;remote-tag=dfg45;local-tag=444
Require: tdialog

<?xml version="1.0" encoding="UTF-8"?>
<ms:requestedParameters
  xmlns:ms="urn:3gpp:ns:mediaState:1.0"
>
  ....
</ms:requestedParameters>
```

**Request-URI:** set to the URI of UE-1

**Refer-To:** contains the URI of UE-2 extended with the method parameter set to MESSAGE and with In-Reply-To URI header field containing the call-id of the SIP REFER request

**Target-Dialog:** contains the dialog identifier of the session being replicated

**application/vnd.3gpp.replication+xml:** lists the playback state parameters to be provided

NOTE 2: the playback state parameters are not shown

#### 10-15. SIP 200 (OK) response for the SIP REFER request (UE-1 to UE-2)

#### 16-21. SIP MESSAGE request (UE-1 to UE-2)

Based on the received SIP REFER request, the UE-2 generate a SIP MESSAGE request with values of the requested playback state parameters.

**Table A.13.2.2-16: SIP MESSAGE request**

```

MESSAGE sip:user2@homel.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222 SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:32ff]:887;comp=sigcomp;branch=z9hG4bKnashds775
Max-Forwards: 70
P-Preferred-Identity: <sip:user1@homel.net>
From: <sip:user1@homel.net>;tag=aaa171828
To: <sip:user2@homel.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222>
Call-ID: dfgaerddffftq34gasgaegr
Cseq: 41112 MESSAGE
Contact: <sip:user1@homel.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/vnd.3gpp.replication+xml
Content-Length: (...)
Supported: 100rel, precondition
In-Reply-To: ddfiftq34gasgaegr

<?xml version="1.0" encoding="UTF-8"?>
<ms:parameterValues
  xmlns:ms="urn:3gpp:ns:mediaState:1.0"
>
  . . . .
</ms:parameterValues>

```

**Request-URI:** set to the URI of UE-2

**In-Reply-To:** containing the value of the In-Reply-To URI header field of the Refer-To header field of the SIP REFER request

**application/vnd.3gpp.replication+xml:** lists the values of the requested playback state parameters

NOTE 3: the playback state parameters and their values are not shown

#### **22-27. SIP 200 (OK) response to SIP MESSAGE request (UE-2 to UE-1)**

The UE-2 confirms the SIP MESSAGE request by sending SIP 200 (OK) response to SIP MESSAGE request.

#### **28-33. SIP NOTIFY request (UE-1 to UE-2)**

The UE-1 informs the UE-2 that the action triggered by SIP REFER request was successfully completed.

#### **34-39. SIP 200 (OK) response to SIP NOTIFY request (UE-2 to UE-1)**

The UE-2 confirms the SIP NOTIFY request by sending SIP 200 (OK) response to SIP NOTIFY request.

#### **40-44. SIP INVITE request (UE-2 to UE-3)**

The UE-2 establishes a session with UE-3 using the remote URI provided in the dialog event package in the step 3.

#### **45-49. SIP 200 (OK) response to SIP INVITE request (UE-3 to UE-2)**

The UE-3 establishes the session by sending SIP 200 (OK) response to SIP INVITE request.

#### **50-54. SIP ACK request (UE-2 to UE-3)**

#### **55. UE-2 sets up the playback state based on the playback state parameters received message 13.**

#### **56-57. Media path:**

Two independent sessions exist - the original session still has the media path between UE-1 and UE-3 and the replicated session has the media path between UE-2 and UE-3.

## A.13.3 Signalling flows for session replication / media replication performed by the remote UE – push mode

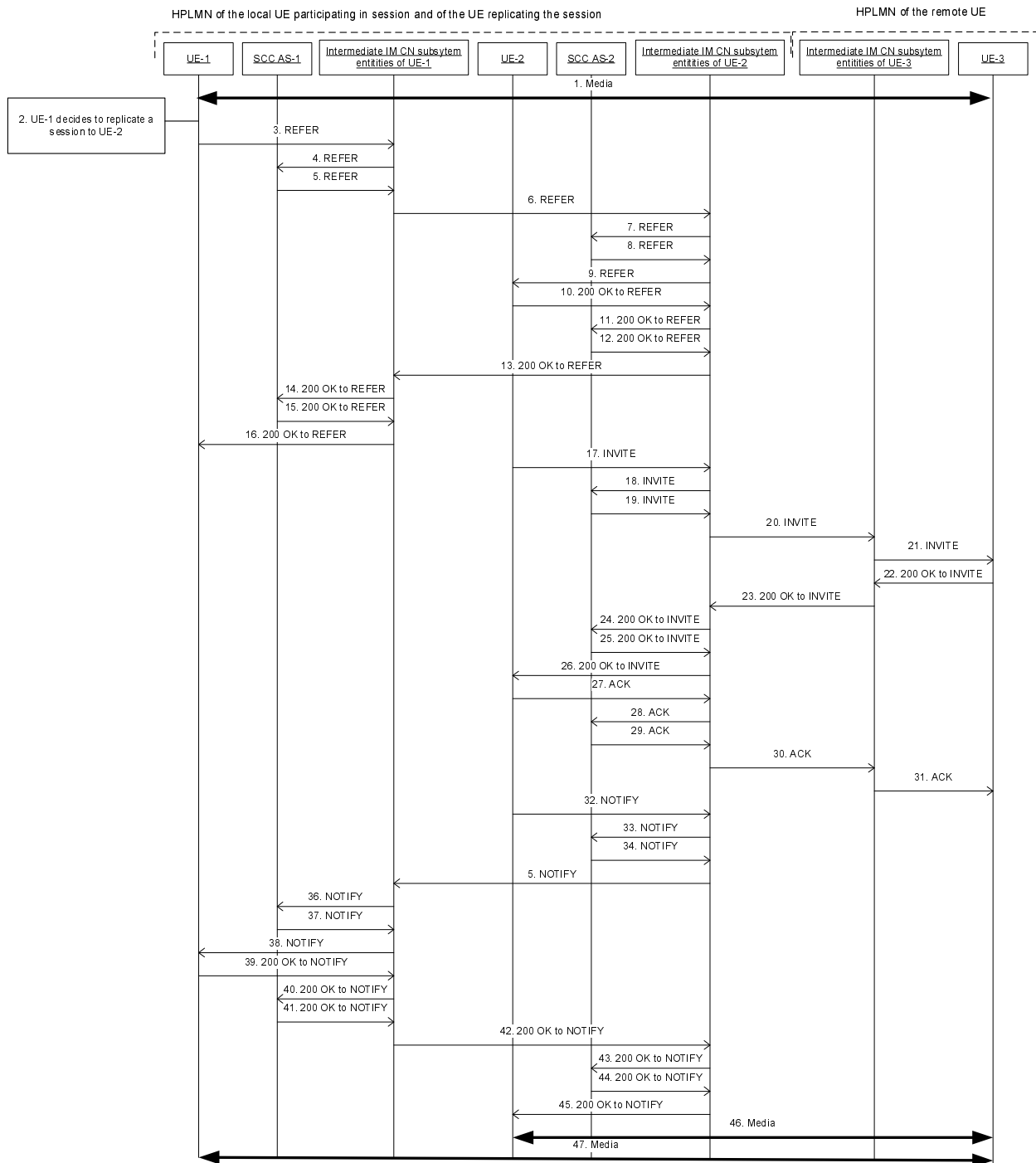
### A.13.3.1 Introduction

The signalling flows in the subclause demonstrate how push mode session replication / media replication performed by remote UE can be applied on a session.

### A.13.3.2 Push mode session replication

In the example flow at the figure A.13.3.2-1, UE-1 has an ongoing multimedia session with UE-3 anchored at SCC AS-1. UE-1 and UE-2 belong to different subscribers.

**Editor's Note (WID IMS\_SC\_eIDT):** It is FFS if the session replication can be replication of some of the media components belonging to the session.



**Figure A.13.3.2-1: Signalling flow for replication of session existing at other UE**

NOTE 1: For clarity, the SIP 100 (Trying) responses and SIP NOTIFY requests with SIP 100 (Trying) are not shown in the signalling flow.

**1. UE-1 is in session with UE-3**

The dialog identifier of the session between SCC AS-1 and UE-1 is AB03a0s09a2sdfgklj490333, remote-tag=dfg45, local-tag=444.

**2. UE-1 decides to replicate the session from UE-1 to UE-2.**

**3-9. SIP REFER request (UE-1 to UE-2) - see example in table A.13.3.2-3**

The UE-1 sends SIP REFER request to UE-2 to request the session replication. When SCC AS-2 receives the SIP REFER request, the SCC AS-2 authorizes the request.

**Table A.13.3.2-3: SIP REFER request (UE-1 to Intermediate IM CN subsystem entities)**

```
REFER sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222 SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:ddd]:1357;comp=sigcomp;branch=z9hG4bKnashds7dfdsdq
Max-Forwards: 70
P-Preferred-Identity: <sip:user1@home1.net>
From: <sip:user1@home1.net>;tag=171828
To: <sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222>
Call-ID: Asdasd23123366
Cseq: 41277 REFER
Contact: <sip:user1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-1111-111111111111>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Length: 0
Refer-To: <sip:user3@home2.net?P-Preferred-Service=urn:urn-7:3gpp-
service.ims.icsi.iptv&Accept-Contact=*%3b+g.3gpp.icsi-ref%3d%22urn%253Aurn-7%253gpp-
service.ims.icsi.iptv%22>
Referred-By: <sip:user1@home1.net>
Require: sec-agree
Proxy-Require: sec-agree
Security-Verify: ipsec-3gpp; q=0.1; alg= hmac-sha-1-96; ealg= aes-cbc; spi-c=98765432; spi-
s=87654321; port-c=8642; port-s=7531
Content-Type: application/vnd.3gpp.replication+xml
Content-Length: (...)

<?xml version="1.0" encoding="UTF-8"?>
<ms:replication>
  <ms:parameterValues
    xmlns:ms="urn:3gpp:ns:mediaState:1.0"
  >
    . . .
  </ms:parameterValues>
</ms:replication>
```

**Request-URI:** contains the GRUU of the UE-2

**Refer-To:** contains the URI of UE-3 and IMS Communication Service of the existing session.

**application/vnd.3gpp.replication+xml:** indicates that push mode replication is requested and if available, lists the values of the playback state parameters

NOTE 2: the playback state parameters and their values are not shown

#### 10-16. SIP 200 (OK) response for the SIP REFER request (UE-1 to UE-2)

#### 17-21. SIP INVITE request (UE-2 to UE-3)

The UE-2 establishes a session with UE-3 based on the information provided in the SIP REFER request.

**Table A.13.3.2-17: SIP INVITE request (UE-2 to UE-3)**

```

INVITE sip:user3@home2.net SIP/2.0
Via: SIP/2.0/UDP 123.112.67.87:5454;comp=sigcomp;branch=z9hG4bKnashds7dfgdfsg
To: sip:user3@home2.net
From: sip:user2@home1.net;tag=acegi
Call-ID: Asdasd2312336asa6
CSeq: 200 INVITE
Max-Forwards: 70
P-Preferred-Identity: sip:user2@home1.net
Contact: <sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222>;+g.3gpp.icsi-
    ref="urn:urn-7%3gpp-service.ims.icsi.iptv"
P-Preferred-Service: urn:urn-7:3gpp-service.ims.icsi.iptv
Accept-Contact: *;+g.3gpp.icsi-ref="urn:urn-7%3gpp-service.ims.icsi.iptv"
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Supported: 100rel, precondition, 199

v=0
o=- 1027933615 1027933615 IN IP4 123.112.67.87
s=-
t=0 0
m=audio 1456 RTP/AVP 96 0
c=IN IP4 123.112.67.87

```

**22-26. SIP 200 (OK) response to SIP INVITE request (UE-3 to UE-2)**

The UE-3 establishes the session by sending SIP 200 (OK) response to SIP INVITE request.

**27-31. SIP ACK request (UE-2 to UE-3)****32-38. SIP NOTIFY request (UE-2 to UE-1)**

The UE-2 informs the UE-1 that the action triggered by SIP REFER request was successfully completed.

**39-45. SIP 200 (OK) response to SIP NOTIFY request (UE-1 to UE-2)**

The UE-1 confirms the SIP NOTIFY request by sending SIP 200 (OK) response to SIP NOTIFY request.

**46-47. Media**

Two independent sessions exist - the original session still has the media path between UE-1 and UE-3 and the replicated session has the media path between UE-2 and UE-3.

---

## A.14 Signalling flows for session discovery

### A.14.1 Introduction

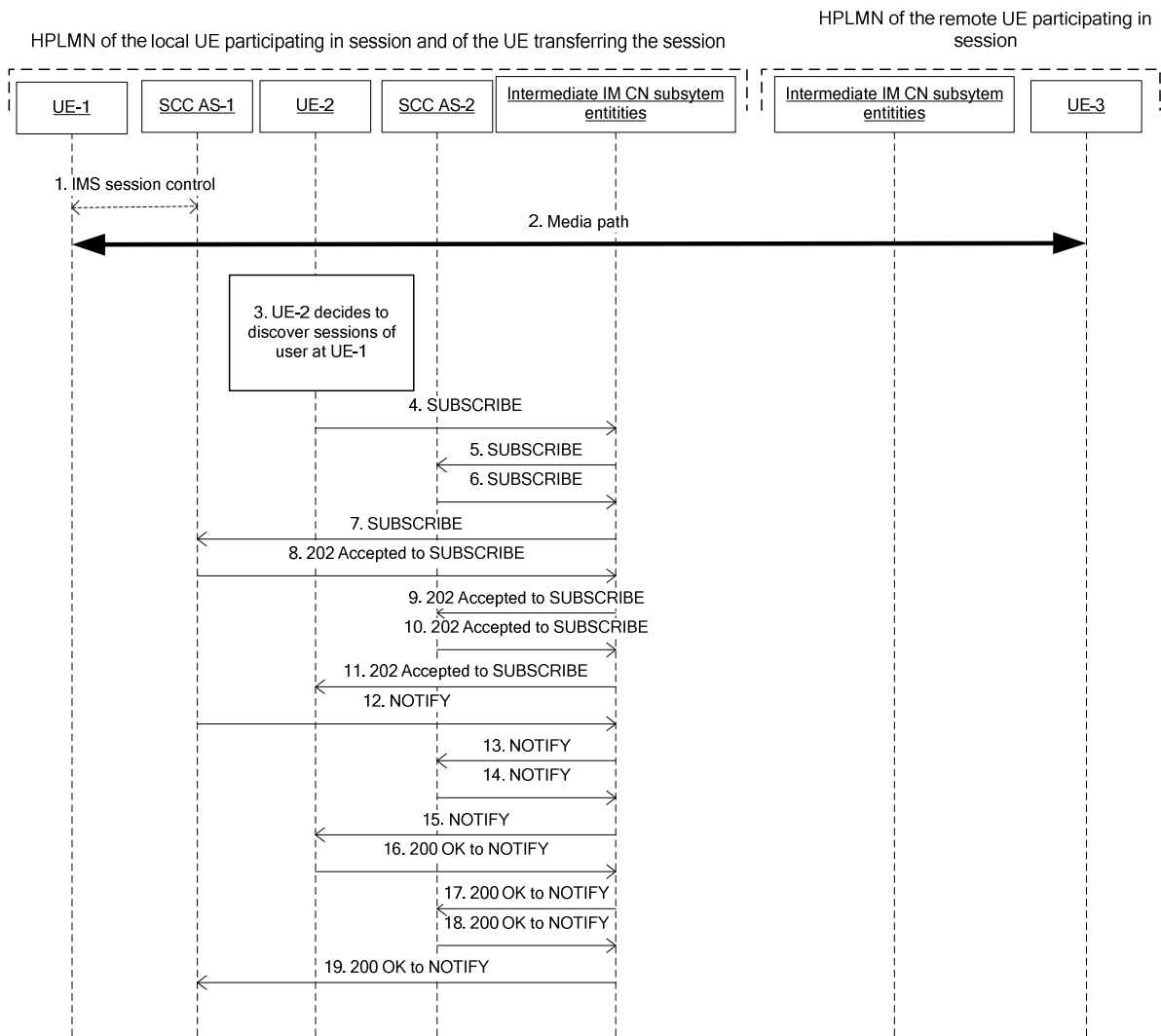
The signalling flows for discovery of sessions demonstrate how a UE can discover sessions of other subscriber. The following signalling flows are included:

- subclause A.14.2 shows an example when a UE discovers sessions of other subscriber of the same PLMN.
- subclause A.14.3 shows an example when a UE discovers sessions of other subscriber of the same PLMN including session descriptions.

### A.14.2 Discovery of sessions of another user of different IMS subscription

In the example flow at the figure A.14.2-1, UE-1 has an ongoing multimedia session with UE-3 anchored at SCC AS-1. UE-1 and UE-2 belong to different subscribers.





**Figure A.14.2-1: Discovery of sessions of user at other UE**

NOTE: For clarity, the SIP 100 (Trying) messages are not shown in the signalling flow.

**1-2. UE-1 is in session with UE-3**

There is a multimedia session comprising audio and video media between the UE-1 and the remote UE-3 anchored at SCC AS-1. The dialog identifier of the session between SCC AS-1 and UE-1 is AB03a0s09a2sdfglkj490333, remote-tag=dfg45, local-tag=444.

**3. UE-2 decides to discover sessions of user at UE-1**

**4-7. SIP SUBSCRIBE request (from UE-2 to SCC AS-1) - see example in table A.14.2-4**

The UE-2 sends a SIP SUBSCRIBE request to fetch the dialog information of the dialogs of user at UE-1. SCC AS-2 is invoked upon originating initial filter criteria but since Request-URI does not contain a URI owned by SCC AS-2, the SCC AS-2 forwards the request.

**Table A.14.2-4: SIP SUBSCRIBE request**

```

SUBSCRIBE sip:user1@home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:fff]:1357;comp=sigcomp;branch=z9hG4bKnashds7664
P-Preferred-Identity: <sip:user2@home1.net>
From: <sip:user2@home1.net>;tag=171828
To: <sip:user1@home1.net>
Call-ID: tq34gasgaeg335r
Event: dialog
CSeq: 145454 SUBSCRIBE
Max-Forwards: 70
Expires: 0
Contact: <sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222>
Accept: application/dialog-info+xml
Accept-Contact: *;+g.3gpp.iut-focus;explicit;require
Content-Length: 0

```

**8-11. SIP 202 (Accepted) response (from SCC AS-1 to UE-2)**

Since the request is addressed to a user served by SCC AS-1 and since the request contains the g.3gpp.iut-focus media feature tag in the Accept-Contact header field, the SCC AS-1 acknowledges the SIP SUBSCRIBE request by sending a SIP 202 (Accepted) response.

**12-15. SIP NOTIFY request (from SCC AS-1 to UE-2) - see example in table A.14.2-12**

The SCC AS-1 sends a SIP NOTIFY request containing the dialog information related to dialogs between the SCC AS-1 and the UEs of the subscribed user.

**Table A.14.2-12: SIP NOTIFY request**

```

NOTIFY sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222 SIP/2.0
Via:
To: <sip:user2@home1.net>;tag=171828
From: <sip:user1@home1.net>;tag=eerr
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:sccas1.home1.example.net
Allow:
Event: dialog
Content-Type: application/dialog-info+xml
Content-Length: (...)

<?xml version="1.0"?>
<dialog-info xmlns="urn:ietf:params:xml:ns:dialog-info"
  version="0"
  state="full"
  entity="sip:user1@home1.net">
  <dialog id="123456" call-id="AB03a0s09a2sdfglkj490333" local-tag="444" remote-tag="dfg45">
  <state>confirmed</state>
  <local>
  <identity>sip:remoteuser@home2.net</identity>
  <target uri="sip:remoteuser@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-333333333333">
  <param pname="+g.3gpp.icsi-ref" pval="urn:urn-7:3gpp-service.ims.icsi.iptv"/>
  </target>
  </local>
  <remote>
  <identity>sip:user1@home1.net</identity>
  <target uri="sip:user1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-111111111111">
  <param pname="+g.3gpp.icsi-ref" pval="urn:urn-7:3gpp-service.ims.icsi.iptv"/>
  </target>
  </remote>
  </dialog>
</dialog-info>

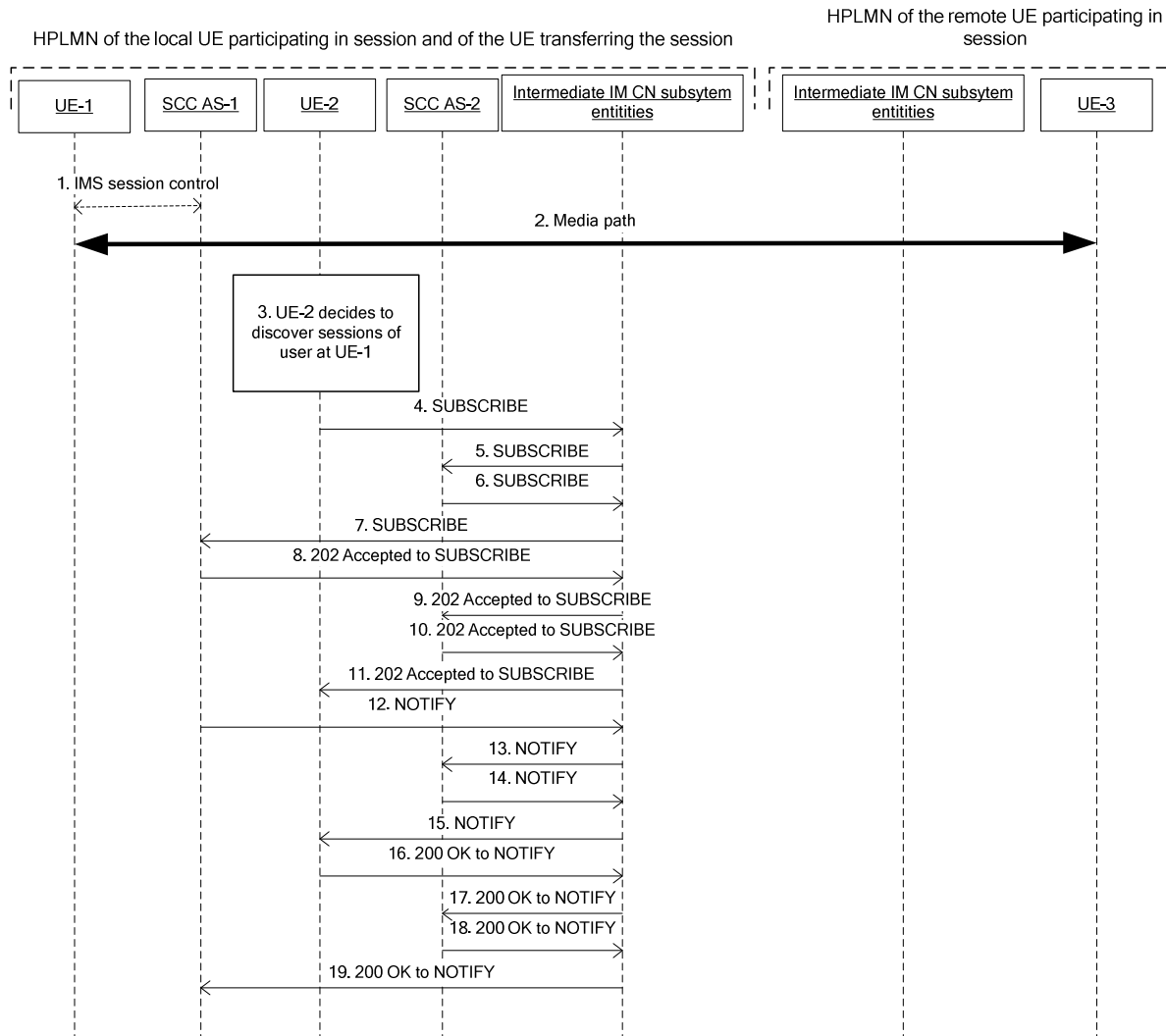
```

**16-19. SIP 200 (OK) response (from UE-2 to SCC AS-1)**

The UE-2 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to SCC AS-1.

### A.14.3 Discovery of sessions of another user of different IMS subscription including session descriptions

In the example flow at the figure A.14.3-1, UE-1 has an ongoing multimedia session with UE-3 anchored at SCC AS-1. UE-1 and UE-2 belong to different subscribers.



**Figure A.14.3-1: Discovery of sessions of user at other UE including session descriptions**

NOTE: For clarity, the SIP 100 (Trying) messages are not shown in the signalling flow.

**1-2. UE-1 is in session with UE-3**

There is a multimedia session comprising audio and video media between the UE-1 and the remote UE-3 anchored at SCC AS-1. The dialog identifier of the session between SCC AS-1 and UE-1 is AB03a0s09a2sdfglkj490333, remote-tag=dfg45, local-tag=444.

**3. UE-2 decides to discover sessions of user at UE-1 including session descriptions**

**4-7. SIP SUBSCRIBE request (from UE-2 to SCC AS-1) - see example in table A.14.3-4**

The UE-2 sends a SIP SUBSCRIBE request to fetch the dialog information of the dialogs of user at UE-1. The UE-2 adds the 'include-session-description' header field parameter to the Event header field. SCC AS-2 is invoked upon originating initial filter criteria but since Request-URI does not contain a URI owned by SCC AS-2, the SCC AS-2 forwards the request.

**Table A.14.3-4: SIP SUBSCRIBE request**

```
SUBSCRIBE sip:user1@home1.net SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:fff]:1357;comp=sigcomp;branch=z9hG4bKnashds7664
P-Preferred-Identity: <sip:user2@home1.net>
From: <sip:user2@home1.net>;tag=171828
To: <sip:user1@home1.net>
Call-ID: tq34gasgaeg335r
Event: dialog; include-session-description
CSeq: 145454 SUBSCRIBE
Max-Forwards: 70
Expires: 0
Contact: <sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-2222222222>
Accept: application/dialog-info+xml
Accept-Contact: *;+g.3gpp.iut-focus;explicit;require
Content-Length: 0
```

**8-11. SIP 202 (Accepted) response (from SCC AS-1 to UE-2)**

Since the request is addressed to a user served by SCC AS-1 and since the request contains the g.3gpp.iut-focus media feature tag in the Accept-Contact header field, the SCC AS-1 acknowledges the SIP SUBSCRIBE request by sending a SIP 202 (Accepted) response.

**12-15. SIP NOTIFY request (from SCC AS-1 to UE-2) - see example in table A.14.3-12**

The SCC AS-1 sends a SIP NOTIFY request containing the dialog information related to dialogs between the SCC AS-1 and the UEs of the subscribed user.

Table A.14.3-12: SIP NOTIFY request

```

NOTIFY sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-222222222222 SIP/2.0
Via:
To: <sip:user2@home1.net>;tag=171828
From: <sip:user1@home1.net>;tag=eerr
Call-ID:
CSeq:
Max-Forwards:
P-Asserted-Identity:
Require:
Contact: sip:sccas1.home1.example.net
Allow:
Event: dialog
Content-Type: application/dialog-info+xml
Content-Length: (...)

<?xml version="1.0"?>
<dialog-info xmlns="urn:ietf:params:xml:ns:dialog-info"
  version="0"
  state="full"
  entity="sip:user1@home1.net">
  <dialog id="123456" call-id="AB03a0s09a2sdfglkj490333" local-tag="444" remote-tag="dfg45">
  <state>confirmed</state>
  <local>
  <identity>sip:remoteuser@home2.net</identity>
  <target uri="sip:remoteuser@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-333333333333">
  <param pname="+g.3gpp.icsi-ref" pval="urn:urn-7:3gpp-service.ims.icsi.iptv"/>
  </target>
  <session-description type="application/sdp">
  v=0
  o=- 1027933615 1027933615 IN IP4 132.54.76.98
  s=-
  t=0 0
  m=audio 49174 RTP/AVP 96 97
  c=IN IP4 132.54.76.98
  b=AS:25.4
  a=rtpmap:96 AMR
  a=fmtp:96mode-set=0,2,5,7; mode-change-period=2
  a=rtpmap:97 telephone-event
  a=maxptime:20
  m=video 1009 RTP/AVP 98 99
  c=IN IP4 132.54.76.98
  a=sendonly
  b=AS:75
  a=rtpmap:98 H263
  a=fmtp:98 H263
  a=fmtp:98 profile-level-id=0
  a=rtpmap:99 MP4V-ES
  </session-description>
  </local>
  <remote>
  <identity>sip:user1@home1.net</identity>
  <target uri="sip:user1@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-111111111111">
  <param pname="+g.3gpp.icsi-ref" pval="urn:urn-7:3gpp-service.ims.icsi.iptv"/>
  </target>
  <session-description type="application/sdp">
  v=0
  o=- 1027933615 1027933615 IN IP4 123.45.67.89
  s=-
  t=0 0
  m=audio 49174 RTP/AVP 96 97
  c=IN IP4 123.45.67.89
  b=AS:25.4
  a=rtpmap:96 AMR
  a=fmtp:96 mode-set=0,2,5,7; mode-change-period=2
  a=rtpmap:97 telephone-event
  a=maxptime:20
  m=video 1009 RTP/AVP 98 99
  c=IN IP4 123.45.67.89
  a=sendonly
  b=AS:75
  a=rtpmap:98 H263
  a=fmtp:98 H263
  a=fmtp:98 profile-level-id=0
  a=rtpmap:99 MP4V-ES
  </session-description>
  </remote>

```

```
</dialog>
</dialog-info>
```

**16-19. SIP 200 (OK) response (from UE-2 to SCC AS-1)**

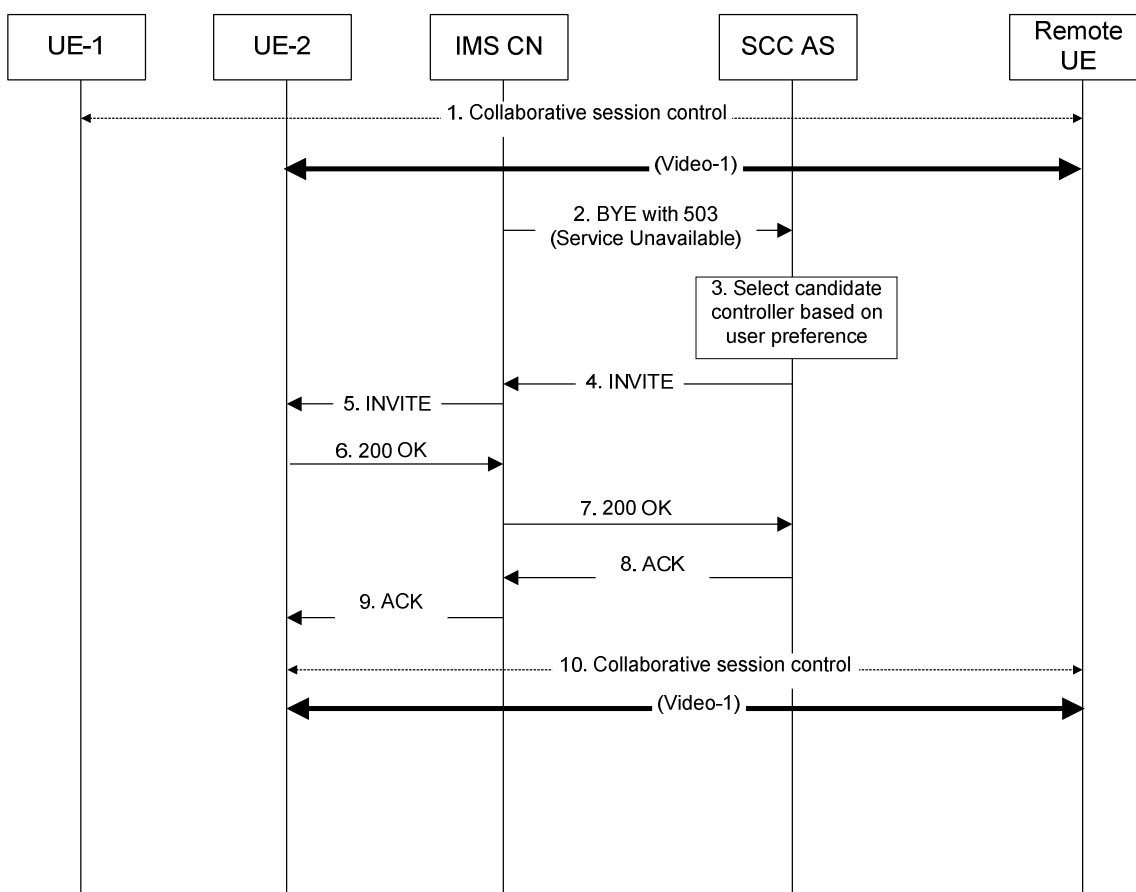
The UE-2 acknowledges the SIP NOTIFY request by sending a SIP 200 (OK) response to SCC AS-1.

## A.15 Signalling flows for collaborative session handling upon loss of collaborative session control

### A.15.1 Introduction

The signalling flows in this subclause demonstrate how a control from controller UE-1 that is lost from the collaborative session can be transferred to UE-2.

### A.15.2 Session handling upon controller lost



**1. Collaborative session controlled by UE-1**

A collaborative session is established between UE-1 and UE-2 and the remote UE with UE-1 acting as the controller UE and UE-2 acting as a controllee UE. For simplicity, other UEs participating in the session are not shown in this flow and only controllee UEs have media flows with the remote UE.

## 2. SIP BYE (IMS CN to SCC AS)

The S-CSCF receives a SIP BYE message with a reason header 503 (Service Unavailable) from P-CSCF that detecting the lost of UE, it routes this SIP BYE message to SCC AS of the session.

## 3. SCC AS checks the controller loss preference user preference

The SCC AS checks the controller loss preference user preference and selects a candidate UE as new controller. Otherwise the session is released.

## 4. SIP re-INVITE request (SCC AS to intermediate IM CN subsystem entities) - see example in table A.15.2-4

The SCC AS sends a SIP re-INVITE request towards the Controllee UE (UE-2). The re-INVITE request contains the XML body from the URI in the Refer-To header field from the SIP REFER request.

**Table A.15.2-4: SIP re-INVITE request (SCC-AS to IM CN subsystem entities)**

```
INVITE sip:user2_public1@home1.net;gr=urn:uuid:f 81d4fae-7dec-11d0-a765-00a0c91e6bf6 SIP/2.0
Via:
Route:
To: sip:user2_public1@home1.net;abcdef
From: sip:user3_public3@home3.net;tag=123456
Call-ID:
CSeq:
Max-Forwards:
Require:
Contact: sip:user3_public3@home3.net;gr=urn:uuid:f81d4fae-17oct-11a1-a678-0054c91eabcd
Allow:
Accept: application/vnd.3gpp.iut+xml
Content-Type: multipart/mixed;boundary="boundary1"
Content-Length: {...}

--boundary1
Content-Type: application/sdp

v=0
o=- 1027933615 1027933615 IN 132.54.76.98
s=-
c=IN IP4 132.54.76.98
t=0 0
m=audio 0 RTP/AVP 97
m=video 3002 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES

--boundary1
Content-Type: application/vnd.3gpp.iut+xml;handling=optional

<controlTransfer>
  <targetController=<sip:user2_public2@home2.net;gr=urn:uuid:f81d4fae-7dec-11d0-a762-
    00a0c91e6bf6>/>
</ControlTansfer>
--boundary1
```

## 5. SIP re-INVITE request (intermediate IM CN subsystem entities to UE-2)

## 6-7. SIP 200 (OK) response (UE-2 to SCC AS through intermediate IM CN subsystem entities)

UE-2 accepts the transfer of control and indicates this by including a g.3gpp.current-iut-controller media feature tag set to Active in the SIP 200 (OK) response it sends to the SCC AS.

**Table A.15.2-6: SIP 200 (OK) response (UE-2 to SCC-AS)**

```
SIP/2.0 200 OK
Via:
To: sip:user1_public2@home1.net;tag=xyzwv
From: sip:interUEtransfer@example.net; tag = 12486
Call-ID:
CSeq:
P-Preferred-Identity:
Contact: sip:user1_public2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6;+g.3gpp
        current-iut-controller=Active
Allow:
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 1027933615 1027933615 IN IP4 145.23.77.88
s=-
c=145.23.77.88
t=0 0
m=audio 0 RTP/AVP 97
m=video 1302 RTP/AVP 98 99
b=AS:75
a=rtpmap:98 H263
a=fmtp:98 profile-level-id=0
a=rtpmap:99 MP4V-ES
```

**8-9. SIP ACK request (from SCC-AS to UE-2)****10. Collaborative session controlled by UE-2**

---

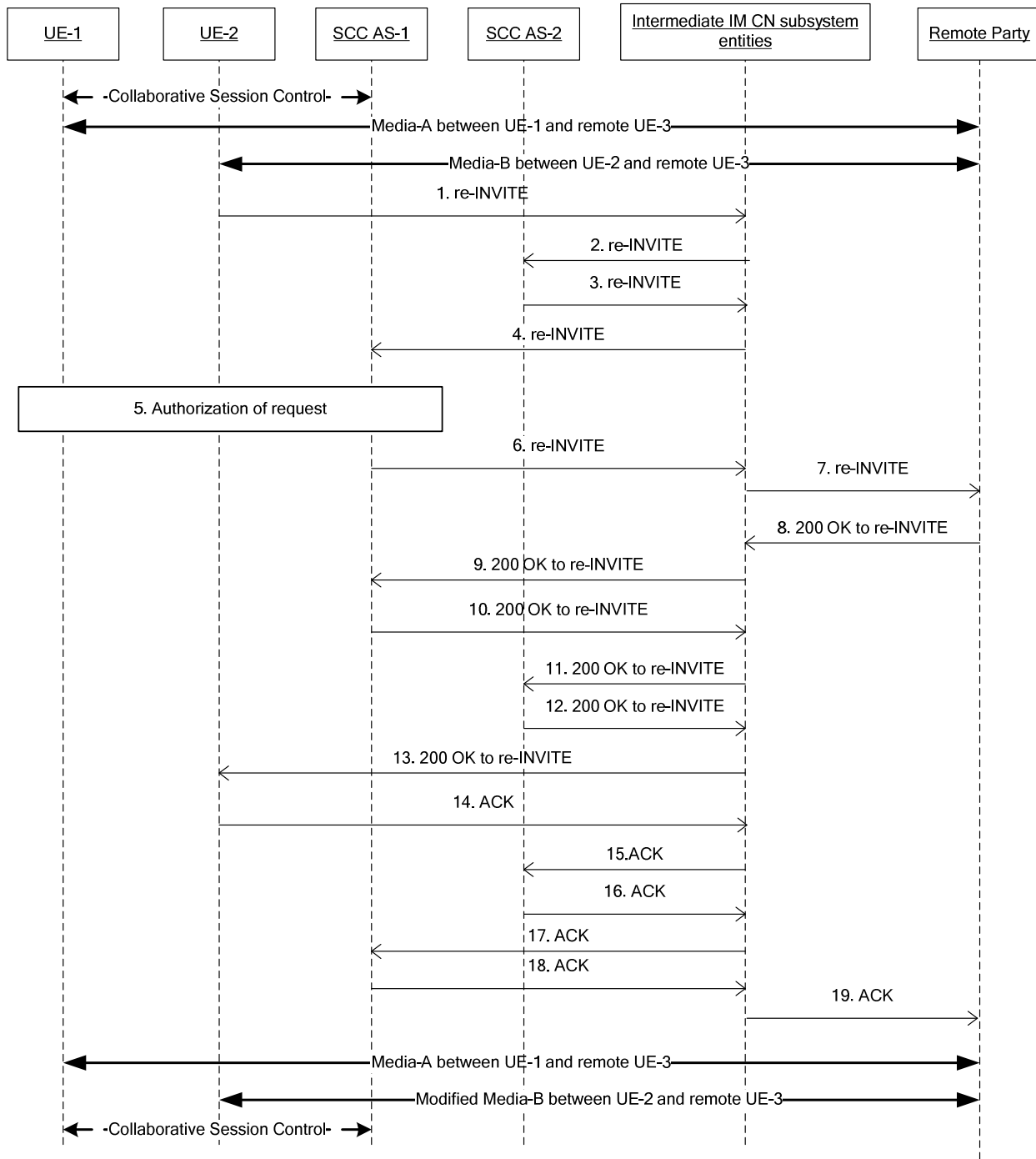
## A.16 Signalling flows for collaborative session media modification

### A.16.1 Introduction

The signalling flow in this subclause demonstrate how a controllee UE initiated media modification on itself.



### A.16.2 Controllee UE initiated media modification on itself



**Figure 4.11.2.2-1: Controllee UE initiated media modification on itself**

NOTE: For clarity, the SIP 100 (Trying) responses are not shown in the signalling flow.

**1-4. SIP re-INVITE request (UE-2 to SCC AS-1) - see example in table 4.11.2.2-2**

The UE-2 sends SIP re-INVITE request to remote UE to modify the media on itself.

**Table 4.11.2.2-1: SIP re-INVITE request (UE-2 to Intermediate IM CN subsystem entities)**

```
INVITE sip:remoteuser@home1.net; SIP/2.0
Via: SIP/2.0/UDP [5555::aaa:bbb:ccc:eee]:1357;comp=sigcomp;branch=z9hG4bKnashds7dfdsdq
Max-Forwards: 70
P-Preferred-Identity: <sip:user2@home1.net>
From: <sip:user2@home1.net>;tag=171828
To: <sip:remoteuser@home1.net>;tag=986765
Call-ID: Asdasd23123366
Cseq: 41277 INVITE
Contact: <sip:user2@home1.net;gr=urn:uuid:f81d4fae-7dec-11d0-2222-2222222222>
Allow: INVITE, ACK, CANCEL, BYE, PRACK, UPDATE, REFER, MESSAGE
Content-Type: application/sdp
Content-Length: (...)

v=0
o=- 2987933615 2987933615 IN IP6 4444::aaa:bbb:ccc:eee
s=-
c=IN IP6 4444::aaa:bbb:ccc:eee
t=0 0
m=audio 4444 RTP/AVP 97
a=rtpmap:97 PCMU/8000
```

**5. Authorizes the request for media modification.****6-7. SIP re-INVITE request (SCC AS-1 to remote UE)**

After successful authorization, SCC AS-1 sends the SIP re-INVITE to the remote UE.

**8-13. SIP 200 (OK) response for the SIP re-INVITE request (Remote UE to UE-2)**

Remote UE responds with SIP 200 (OK) response to UE-2.

**14-19. SIP ACK request (UE-2 to remote UE)**

The UE-2 sends the SIP ACK request to remote UE.

---

## Annex B (normative): Media feature tags and feature-capability indicators defined within the current document

### B.1 General

This subclause describes the media feature tag definitions and the feature-capability indicator definitions that are applicable for the 3GPP IM CN Subsystem for the realisation of the IUT transfer controller functions.

---

### B.2 Definition of media feature tag g.3gpp.iut-controller

Media feature-tag name: g.3gpp.iut-controller

ASN.1 Identifier: 1.3.6.1.8.2.9

Summary of the media feature indicated by this tag: This media feature-tag when used in a SIP request or a SIP response indicates that the function sending the SIP message supports the IUT Controller functionality. This media feature tag does not imply that the controller UE capabilities are handled in the same protocol manner.

Values appropriate for use with this feature-tag: Boolean

The feature-tag is intended primarily for use in the following applications, protocols, services, or negotiation mechanisms: This feature-tag is most useful in a communications application, for describing the capabilities of a device, such as a phone or PDA.

Examples of typical use: Indicating that a mobile phone supports the IUT controller capability

Related standards or documents: 3GPP TS 24.337: "IP Multimedia Subsystem (IMS) inter-UE transfer; Stage 3"

Security Considerations: Security considerations for this media feature-tag are discussed in subclause 14.1 of IETF RFC 3840 [24].

---

### B.3 Definition of media feature tag g.3gpp.iut-focus

Media feature-tag name: g.3gpp.iut-focus

ASN.1 Identifier: 1.3.6.1.8.2.10

Summary of the media feature indicated by this tag:

This media feature-tag when used in a Contact header field or a Accept-Contact header field of a SIP request or a SIP response indicates that the function sending the SIP message supports anchoring a IUT session and/or the SIP message is an inter-UE transfer operation.

Values appropriate for use with this feature-tag: Boolean

The feature-tag is intended primarily for use in the following applications, protocols, services, or negotiation mechanisms: This feature-tag is most useful in a communications application, for indicating that the function sending the SIP message supports anchoring a IUT session and/or the SIP message request is an inter-UE transfer operation.

Examples of typical use: Indicating that a SCC AS has anchored the related IUT session and/or indicating that to the IMS core that the SIP message is an inter-UE transfer operation.

Related standards or documents: 3GPP TS 24.337: "IP Multimedia Subsystem (IMS) inter-UE transfer; Stage 3"

Security Considerations: Security considerations for this media feature-tag are discussed in subclause 14.1 of IETF RFC 3840 [34].

---

## B.4 Definition of media feature tag g.3gpp.current-iut-controller

Media feature-tag name: g.3gpp.current-iut-controller

ASN.1 Identifier: 1.3.6.1.8.2.11

Summary of the media feature indicated by this tag:

This media feature-tag when used in a Contact header field of SIP request or SIP response indicates that the UA is the currently active IUT controller for the collaborative session or is a controllee in the collaborative. The values of the feature tag are "active" and "passive".

Values appropriate for use with this feature-tag: string with syntax as follows:

"active" indicates that the UA is the currently active IUT controller for the collaborative session.

"passive" indicates that the UA is a controllee in the collaborative session but is willing to become an active controller for the collaborative session.

The feature-tag is intended primarily for use in the following applications, protocols, services, or negotiation mechanisms: This feature-tag is most useful in a communications application, for Inter UE control transfer operation.

Examples of typical use: Indicating that a UA wishes to relinquish control of the collaborative session and requesting a UA to become the active IUT controller for the collaborative session.

Related standards or documents: 3GPP TS 24.337: "IP Multimedia Subsystem (IMS) inter-UE transfer; Stage 3"

Security Considerations: Security considerations for this media feature-tag are discussed in subclause 14.1 of IETF RFC 3840 [24].

---

## B.5 Definition of feature-capability indicator g.3gpp.iut-focus

Feature-capability indicator name:

g.3gpp.iut-focus

Summary of feature indicated by this feature-capability indicator:

This feature-capability indicator when used in a Feature-Caps header field of a SIP request or a SIP response indicates that the function which inserted the Feature-Caps header field supports anchoring an IUT session.

Feature-capability indicator specification reference:

3GPP TS 24.337, [http://www.3gpp.org/ftp/Specs/archive/24\\_series/24.337/](http://www.3gpp.org/ftp/Specs/archive/24_series/24.337/)

Values appropriate for use with this feature-capability indicator:

none

Examples of typical use:

Indicating that a SCC AS has anchored the related IUT session. Examples can be found in 3GPP TS 24.337: "IP Multimedia Subsystem (IMS) inter-UE transfer; Stage 3".

Security considerations: Security considerations for this feature-capability indicator are discussed in clause 9 of IETF RFC 6809 [44].

## Annex C (informative): XML schemas

### C.1 Replication body

#### C.1.1 General

This subclause defines XML schema and MIME type of the replication body.

**NOTE:** IMS communication services using the session replication can define parameters describing the playback state parameters by substitution of the parameterAbstract element.

#### C.1.2 XML schema

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema
  targetNamespace="urn:3gpp:ns:replication:1.0"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:ms="urn:3gpp:ns:replication:1.0"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">

  <xs:element name="requestedParameters" type="ms:requestedParametersType"/>
  <xs:complexType name="requestedParametersType">
    <xs:sequence>
      <xs:element ref="ms:parameterAbstract" minOccurs="0" maxOccurs="unbounded"/>
      <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax"/>
  </xs:complexType>

  <xs:element name="parameterValues" type="ms:parameterValuesType"/>
  <xs:complexType name="parameterValuesType">
    <xs:sequence>
      <xs:element ref="ms:parameterAbstract" minOccurs="0" maxOccurs="unbounded"/>
      <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax"/>
  </xs:complexType>

  <xs:element name="parameterAbstract" type="ms:parameterAbstractType" abstract="true"/>
  <xs:complexType name="parameterAbstractType"/>

  <xs:element name="replication" type="ms:replicationType"/>
  <xs:complexType name="replicationType">
    <xs:sequence>
      <xs:element ref="ms:parameterValues" minOccurs="0"/>
      <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax"/>
  </xs:complexType>
</xs:schema>
```

#### C.1.3 IANA registration template

**Editor's note (WID IMS\_SC\_eIDT):** The MIME type "application/vnd.3gpp.replication+xml" as defined in this subclause is to be registered in the IANA registry for Application Media Types based upon the following template when the Rel-10 is frozen.

MIME media type name:

application

MIME subtype name:

vnd.3gpp.replication+xml

Required parameters:

None

Optional parameters:

"charset" the parameter has identical semantics to the charset parameter of the "application/xml" media type as specified in IETF RFC 3023 [29].

Encoding considerations:

binary.

Security considerations:

Same as general security considerations for application/xml as specified in section 10 of IETF RFC 3023 [29]. In addition, this content type provides a format for exchanging information in SIP, so the security considerations from IETF RFC 3261 [30] apply.

The information transported in this MIME media type does not include active or executable content.

Mechanisms for privacy and integrity protection of protocol parameters exist. Those mechanisms as well as authentication and further security mechanisms are described in 3GPP TS 24.229 [7].

Interoperability considerations:

Same as interoperability considerations as specified in section 3.1 of IETF RFC 3023 [29].

The requestedParameters element is the root element, when the body contains the playback state parameters to be provided. The parameterValues element is the root element, when the body contains the playback state parameter values. The replication element is the root element, when the body indicates replication request.

Published specification:

3GPP TS 24.337: "IP Multimedia Subsystem (IMS) inter-UE transfer; Stage 3", available via <http://www.3gpp.org/specs/numbering.htm>.

Applications which use this media:

Applications support the inter-UE transfer as described in the published specification.

Intended usage:

COMMON

Additional information:

1. Magic number(s): none
2. File extension(s): none
3. Macintosh file type code: none
4. Object Identifiers: none

Editor's note (WID IMS\_SC\_eIDT): it is FFS whether to have a separate MIME type for playback state.

---

## C.2 IUT transfer feature XML schema

### C.2.1 General

This subclause defines XML schema and MIME type related to the IUT transfer features.

## C.2.2 XML schema

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">

  <xs:element name="controlTransfer" type="TcontrolTransfer"/>

  <xs:complexType name="TcontrolTransfer">
    <xs:sequence>
      <xs:element name="controllee" type="xs:anyURI" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element name="targetController" type="xs:anyURI" minOccurs="0" maxOccurs="unbounded"/>
      <xs:element name="activeController" type="xs:anyURI" minOccurs="0" maxOccurs="unbounded"/>
      <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax"/>
  </xs:complexType>

</xs:schema>
```

## C.2.3 IANA registration template

**Editor's note:** The MIME type "application/vnd.3gpp.iut+xml" as defined in this subclause is to be registered in the IANA registry for Application Media Types based upon the following template.

MIME media type name:

application

MIME subtype name:

application/vnd.3gpp.iut+xml

Required parameters:

None

Optional parameters:

"charset" the parameter has identical semantics to the charset parameter of the "application/xml" media type as specified in IETF RFC 3023 [29].

Encoding considerations:

binary.

Security considerations:

Same as general security considerations for application/xml as specified in section 10 of IETF RFC 3023 [29]. In addition, this content type provides a format for exchanging information in SIP, so the security considerations from IETF RFC 3261 [30] apply.

The information transported in this MIME media type does not include active or executable content.

Mechanisms for privacy and integrity protection of protocol parameters exist. Those mechanisms as well as authentication and further security mechanisms are described in 3GPP TS 24.229 [7].

Interoperability considerations:

Same as interoperability considerations as specified in section 3.1 of IETF RFC 3023 [29].

Published specification:

3GPP TS 24.337: "IP Multimedia Subsystem (IMS) inter-UE transfer; Stage 3", available via <http://www.3gpp.org/specs/numbering.htm>.

Applications which use this media:

Applications supporting the Inter UE Transfer as described in the published specification.

Intended usage:

COMMON

Additional information:

1. Magic number(s): none
2. File extension(s): none
3. Macintosh file type code: none
4. Object Identifiers: none

---

## C.3 IUT preferences XML schema

### C.3.1 General

This subclause defines XML schema and MIME type related to IUT user preferences.

The IUT service contains a rule set that specifies how the IUT service shall react to external stimuli.

The AUID of the IUT user preferences XCAP application usage is "org.3gpp.iut".

The default namespace of the IUT user preferences XCAP application usage is "urn:3gpp:ns:iut:1.0".

The MIME type of the IUT user preferences XML document is specified in annex C.4.

### C.3.2 Structure of the XML document

#### C.3.2.1 IUT element

The IUT configuration can contain a Controller Loss Preferences element and a rule set.

The rule set reuses the syntax as specified by the common policy draft (see IETF RFC 4745 [42]).

```
<iut active="true">
  <cp:ruleset>
    rule1
    rule2
  </cp:ruleset>
</iut>
```

In general the following procedure applies:

When the service processes a set of rules it shall start with the first rule and test if its conditions are all true, if this is the case the rule matches and the specified action shall be executed.

When the rule does not match the following rule shall be selected and the same procedure repeated, until a matching rule is found or the set of remaining rules is empty.

In subclause C.3.2.4 all allowed conditions are specified, normally rules are evaluated at communication setup time, for conditions where this is not the case this is explicitly indicated.

#### C.3.2.2 IUT rules

The IUT service is configured with an ordered set of IUT rules. The XML Schema reuses the rule syntax as specified by the common policy draft (see IETF RFC 4745 [42]). The rules take the following form:

```
<cp:rule id="rule66">
  <cp:conditions>
```



```

    condition1
    condition2
  </cp:conditions>
</cp:actions>
  <enable-collaborative-sessions/>
</cp:actions>
</cp:rule>

```

To give more guidance, examples of rules are shown below:

```

<cp:rule id="rule66">
<cp:conditions>
  <media>PCMA</media>
  <cp:identity>
    <cp:one>id=serveduser@domain</cp:one>
  </cp:identity>
</cp:conditions>
<cp:actions>
  <enable-collaborative-sessions/>
</cp:actions>
</cp:rule>

```

```

<cp:rule id="rule66">
<cp:conditions/>
<cp:actions>
  <controller-loss-preferences>
    <controller>uri</controller>
  </controller-loss-preference>
</cp:actions>
</cp:rule>

```

When the service processes a set of rules it shall start with the first rule and test if its conditions are all true, if this is the case the rule matches and the specified action is executed. When a rule matches remaining rules in the rule set shall be discarded. Applied to the fragment above this means that only if the expression (*condition1* AND *condition2*) evaluates to true that then the *rule66* matches and the forward-to action is executed.

When the rule does not match the following rule shall be selected and the same procedure repeated, until a matching rule is found or the set of remaining rules is empty.

The "id" attribute value of a rule shall uniquely identify the rule within a rule set. This can be used in XCAP usage to address one specific rule.

### C.3.2.3 IUT rule conditions

The following conditions are allowed by the XML Schema for IUT service:

- cp:identity: This condition evaluates to true when the *calling* user's identity matches with the value of the identity element. The interpretation of all the elements of this condition is described in OMA-TS-XDM-Core-V1\_1 [45]. In all other cases the condition evaluates to false. The Identity shall be matched against the value taken from the P-Asserted-Identity header field, and in addition as an option matched against the From header field and/or the Referred-By header field, unless both the <identity> element value and the Contact header field value contain a "gr" parameter, then the <identity> element value shall be matched against the value taken from the Contact header field;
- anonymous: This condition evaluates to true when the P-Asserted-Identity of the calling user is not provided or privacy restricted;
- media: When the incoming call request for certain media, the forwarding rule can decide to forward the call for this specific media. This condition evaluates to true when the value of this condition matches the media field in one of the "m=" lines in the SDP (IETF RFC 4566 [41]) offered in an INVITE request (IETF RFC 3261 [26]).

NOTE: As described in IETF RFC 4745 [42] the case of unconditional evaluates to be true in all cases where all other reasons are not applicable. Collaborative sessions are enabled as soon as the served user is the called user. The indication of unconditional is the absence of any reason element in the cp:conditions element.

The following conditions are allowed by the XML Schema for the IUT service:

- ICSI: This condition evaluates to true when the value of the ICSI element matches with a URI parameter in the P-Asserted-Service header field;
- RequestURI: This condition evaluates to true when the value of the RequestURI element matches with the Request-URI.

Information of which of the above mentioned conditions the user is allowed to use can be obtained from the network by using the schema defined in subclause C.3.3.

### C.3.2.4 IUT rule actions

The action supported by the CDIV service is forwarding of calls. For this the forward-to action has been defined. The forward-to action takes the following elements:

enable-collaborative-sessions: specifies that collaborative sessions are enabled.

controller-loss-preferences: candidate UEs in controller loss preferences can be configured using the value of the <controller> child element of the <controller-loss-preferences> element. Each <controller> element contains a URI. The URI identifies a UE that is a candidate UE for controller loss preference in priority order.

## C.3.3 XML schema

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:iut="urn:3gpp:ns:iut:1.0"
  xmlns:cp="urn:ietf:params:xml:ns:common-policy"
  xmlns:ocp="urn:oma:xml:xm:common-policy"
  targetNamespace="urn:3gpp:ns:iut:1.0"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">
  <!-- import common policy definitions -->
  <xs:import namespace="urn:ietf:params:xml:ns:common-policy" schemaLocation="common-policy.xsd"/>
  <!-- import OMA common policy extensions -->
  <xs:import namespace="urn:oma:xml:xm:common-policy" schemaLocation="OMA-SUP-XSD_xdm_commonPolicy-
V1_0_2-20070830-A.xsd"/>
  <!-- IUT specific extensions to IETF common policy conditions -->
  <!-- IUT rule set based on the common policy rule set.-->
  <xs:element name="iut">
  <xs:annotation>
  <xs:documentation>This is the IUT configuration document.</xs:documentation>
  </xs:annotation>
  <xs:complexType>
  <xs:sequence>
  <xs:element ref="cp:ruleset" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="active" type="xs:boolean" use="optional" default="true"/>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
  </xs:complexType>
  </xs:element>

  <!-- iut specific to extensions IETF common policy conditions -->
  <xs:element name="anonymous" type="iut:empty-element-type"/>
  <xs:element name="RequestURI" type="xs:anyURI"/>
  <xs:element name="ICSI" type="xs:string"/>
  <xs:complexType name="supported-media-type">
  <xs:choice>
  <xs:element name="all-media" type="iut:empty-element-type"/>
  <xs:element name="no-media" type="iut:empty-element-type"/>
  <xs:sequence minOccurs="0" maxOccurs="unbounded">
  <xs:element name="media" type="iut:media-type"/>
  </xs:sequence>
  <xs:any namespace="##other" processContents="lax"/>
  </xs:choice>
  </xs:complexType>
  <!-- iut specific extensions to IETF common policy actions-->
  <xs:element name="enable-collaborative-sessions" type="iut:empty-element-type"/>
  <xs:element name="controller-loss-preferences">
  <xs:complexType>
  <xs:sequence>
  <xs:element name="controller" type="xs:anyURI" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
```

```
</xs:complexType>
</xs:element>

<!-- utility xml elements -->
<xs:complexType name="empty-element-type"/>
<xs:simpleType name="media-type" final="list restriction">
<xs:restriction base="xs:string"/>
</xs:simpleType>

</xs:schema>
```

### C.3.4 IANA registration template

**Editor's note: The MIME type "application/vnC.3gpp.iut-config+xml" as defined in this subclause is to be registered in the IANA registry for Application Media Types based upon the following template.**

MIME media type name:

Application.

MIME subtype name:

vnC.3gpp.iut-config+xml.

Required parameters:

None.

Optional parameters:

"charset" the parameter has identical semantics to the charset parameter of the "application/xml" media type as specified in IETF RFC 3023 [29].

Encoding considerations:

binary.

Security considerations:

Same as general security considerations for application/xml as specified in section 10 of IETF RFC 3023 [29]. In addition, this content type provides a format for exchanging information in SIP, so the security considerations from IETF RFC 3261 [30] apply. Furthermore, 3GPP has defined mechanisms for ensuring the privacy and integrity protection of the bodies of XCAP messages used in the 3GPP IM CN Subsystem.

The information transported in this MIME media type does not include active or executable content.

Mechanisms for privacy and integrity protection of protocol parameters exist. Those mechanisms as well as authentication and further security mechanisms are described in 3GPP TS 24.229 [7].

Interoperability considerations:

Same as interoperability considerations as specified in section 3.1 of IETF RFC 3023 [29].

Published specification:

3GPP TS 24.337: "IP Multimedia Subsystem (IMS) inter-UE transfer; Stage 3"

Applications which use this media:

Applications that use the 3GPP IM CN Subsystem as defined by 3GPP.

Intended usage:

COMMON

Additional information:

1. Magic number(s): none
2. File extension(s): none

3. Macintosh file type code: none
4. Object Identifiers: none

---

## C.4 IUT presence information XML schema

### C.4.1 General

This subclause defines XML schema that is used as extension to PIDF defined in RFC 3863 [47] for IUT operations soliciations by IUT UEs.

### C.4.2 XML schema

```
<?xml version="1.0" encoding="UTF-8"?>
  <xs:schema targetNamespace="urn:ietf:params:xml:ns:pidf:iut"
    xmlns:iut="urn:ietf:params:xml:ns:pidf:iut"
    xmlns:xs="http://www.w3.org/2001/XMLSchema"
    elementFormDefault="qualified"
    attributeFormDefault="unqualified">

    <xs:element name="IUT-solicitation" type="tIUT-solicitation"/>
    <xs:complexType name="tIUT-solicitation">
      <xs:sequence>
        <xs:element name="mediaType" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>
        <xs:element name="sessionControl" type="xs:boolean" minOccurs="0" maxOccurs="1"/>
        <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:complexType>

  </xs:schema>
```

---

## Annex D (normative): SDP Attributes defined within the current document

### D.1 General

This subclause describes the SDP attribute definitions that are applicable for the 3GPP IM CN Subsystem for the realisation of the IUT functions.

---

### D.2 Definition of SDP attribute a=3gpp.iut.replication

SDP Attribute name: a=3gpp.iut.replication

Summary of the SDP attribute indicated by this attribute: This SDP attribute when used in a SIP request or a SIP response indicates how the session/media replication is performed.

Values appropriate for use with this feature-tag: none

The 3gpp.iut.replication attribute is both a session-level attribute and media-level attribute, and it is not dependent on the charset.

Examples of typical use: Indicating that the media/session is to be replicated. .

Related standards or documents: 3GPP TS 24.337: "IP Multimedia Subsystem (IMS) inter-UE transfer; Stage 3"

Security Considerations: none

---

## D.3 Definition of SDP attribute a=3gpp.iut.controllee

SDP Attribute name: a=3gpp.iut.controllee

ASN.1 Identifier: 1.3.6.1.8.2.x

**Editor's note:** The ASN.1 Identifier will need to be updated once the IANA registration is completed.

**Editor's note:** The IANA registration needs to be done when Rel-10 frozen.

Summary of the SDP attribute indicated by this attribute: This SDP attribute when used in a SIP request or a SIP response indicates the SIP address of the controllee UE in collaborative session.

Values appropriate for use with this attribute:

<address> = SIP address of controllee UE

The 3gpp.iut.controllee attribute is a media attribute and it is not dependent on charset.

Examples of typical use: Indicating that the media is established in the controllee UE of the collaborative session.

Related standards or documents: 3GPP TS 24.337: "IP Multimedia Subsystem (IMS) inter-UE transfer; Stage 3"

Security Considerations: none

## Annex E (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	R ev	Subject/Comment	Old	New
2011-02	CT1#70	C1-111033			Version 0.0.0	-	0.0.0
2011-02	CT1#70	C1-111034		°	Incorporate agreed P-CRs from CT1#70 TS 24.abc – scope		
		C1-111202			Initial input for IMS_SC_eIDT into 3GPP TS 24.abc		
		C1-111203			Inter-UE transfer without establishing a collaborative session, pull mode, procedures		
		C1-111204			Inter-UE replication by remote UE, SCC AS procedures		
		C1-111205			Procedures for collaborative session of participants of different subscriptions		
		C1-111206			Procedures of session replication performed by SCC AS		
		C1-111208			Media modification		
		C1-111211			Collaborative session establishment at originating session setup with forked responses		
		C1-111260			Shifting Rel-10 IUT material INTO 3GPP TS 24.abc		
		C1-111261			Collaborative session discovery by UEs of different subscriber, procedures		
		C1-111262			Execution of Supplementary Services		
		C1-111265			Shifting Media flows transfer		
		C1-111285			Transfer of collaborative session control		
		C1-111304			IUT controller loss		
		C1-111305			Collaborative session establishment at originating session setup		
		C1-111334			Collaborative session establishment at terminating session setup		
		C1-111343			IUT user configuration		
					Editor: Renumbered Clauses. Deleted unused references. Renumbered and sorted references. Additional, smaller editorials.		
2011-02	CT1#70	C1-111342			TS 24.abc v0.1.0	0.0.0	0.1.0
2011-03					TS 24.abc v0.1.1	0.1.0	0.1.1
					Editorial changes and corrections.		
2011-03	CT-51				Version 1.0.0 created for presentation to CT-51 for information and approval	0.1.1	1.0.0
2011-03	CT-51				Version 1.0.1 – assigned TS number 24.337	1.0.0	1.0.1
2011-03	CT-51				Version 10.0.0 created after approval at CT-51	1.0.1	10.0.0
2011-06	CT-52	CP-110475	0002	1	Editorial corrections on controller transfer procedures	10.0.0	10.1.0
2011-06	CT-52	CP-110475	0003	1	Editorial corrections on controller transfer flow	10.0.0	10.1.0
2011-06	CT-52	CP-110475	0004	1	Editorial corrections on procedures for media replication by SCC AS	10.0.0	10.1.0
2011-06	CT-52	CP-110475	0005	1	Editorial corrections on flows for media replication by SCC AS	10.0.0	10.1.0
2011-06	CT-52	CP-110475	0006	1	Editorial corrections on procedures for collaborative sessions with different subscriptions	10.0.0	10.1.0
2011-06	CT-52	CP-110475	0007	3	Delete unneeded Editor's Notes	10.0.0	10.1.0
2011-06	CT-52	CP-110475	0008	2	Reference update and cleanup of IUT	10.0.0	10.1.0
2011-06	CT-52	CP-110475	0010	2	Several corrections on media flows transfer procedure initiated by the target UE or by a UE other than the target UE	10.0.0	10.1.0
2011-06	CT-52	CP-110475	0011	2	Correction of information call flow about media flow transfer in the Annex A.11	10.0.0	10.1.0
2011-09	CT-53	CP-110670	0012	1	Editorial corrections on signalling flow for collaborative sessions with different subscriptions	10.1.0	10.2.0
2011-09	CT-53	CP-110670	0015	1	Corrections related to the media feature tag g.3gpp.iut-focus	10.1.0	10.2.0

2011-09	CT-53	CP-110670	0017	3	Corrections of IUT procedures	10.1.0	10.2.0
2011-12	CT-54	CP-110870	0020		Inclusion of media feature tag ASN.1 identifier for g.3gpp.iut-controller	10.2.0	10.3.0
2011-12	CT-54	CP-110870	0022	2	proxy-feature I-D reference update	10.2.0	10.3.0
2011-12	CT-54	CP-110881	0016	2	Signalling flow of A.3.3	10.3.0	11.0.0
2011-12	CT-54	CP-110881	0018	3	Pull transfer without prior information on the ongoing sessions	10.3.0	11.0.0
2011-12	CT-54	CP-110881	0019	2	Procedure for complete transfer in services defining terminating session set up in UE	10.3.0	11.0.0
2011-12	CT-54	CP-110881	0021	1	Clarification on target UE discovery	10.3.0	11.0.0
2012-03	CT-55	CP-120109	0024	1	Reference update: draft-holmberg-sipcore-proxy-feature	11.0.0	11.1.0
2012-03	CT-55	CP-120109	0026	2	Correction of the the destination of IUT request message in subclause 16.3	11.0.0	11.1.0
2012-03	CT-55	CP-120124	0028	1	Editorial error correction in subclause 4.1	11.0.0	11.1.0
2012-03	CT-55	CP-120103	0030	2	Correction of 14.2.1 Procedures for adding new media on controllee UE by controller UE	11.0.0	11.1.0
2012-09	CT-57	CP-120579	0032	1	Reference update and technical changes: draft-ietf-sipcore-proxy-feature	11.1.0	11.2.0
2012-09	CT-57	CP-120579	0034		Correcting 300 Multiple Choices Response Procedure	11.1.0	11.2.0
2012-12	CT-58	CP-120786	0036	1	Feature-Caps header field in target refresh requests and responses	11.2.0	11.3.0
2012-12	CT-58	CP-120786	0038	3	IUT Media Feature Tags Value Updates for IANA Registration	11.2.0	11.3.0
2013-03	CT-59	CP-130104	0041		Reference update: RFC 6809	11.3.0	11.4.0
2013-06	CT-60	CP-130238	0043	1	g.3gpp.current-iut-controller IANA value	11.4.0	11.5.0
2013-06	CT-60	CP-130238	0045	1	g.3gpp.iut-focus IANA value	11.4.0	11.5.0
2013-06	CT-60	CP-130238	0049		Completed IANA registrations for 24.337	11.4.0	11.5.0
2013-06	CT-60	CP-130238	0051	2	Resolving IANA comments for 24.337	11.4.0	11.5.0
2013-12	CT-62	CP-130735	0053	1	Correcting SCC AS procedures	11.5.0	11.6.0
2014-03	CT-63	CP-140147	1013	2	Updating TS 24.337 to RFC 6665	11.6.0	12.0.0
2015-03	CT-67	CP-150067	1014	3	Update REFER to reflect RFC 6665	12.0.0	12.1.0
2015-12	CT-70				Upgrade to Rel-13	12.1.0	13.0.0
2016-06	CT-72	CP-160306	1018		Update draft-ietf-sipcore-refer-clarifications reference to reflect RFC 7647	13.0.0	13.1.0

#### Change history

Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2017-03	CT-75					Upgrade to Rel-14	14.0.0
2024-12	CT-106	<a href="#">CP-243215</a>	1026	-	A	Reference update on the IETF draft	14.1.0

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# History

<b>Document history</b>		
V14.0.0	April 2017	Publication
V14.1.0	January 2025	Publication