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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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Foreword

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Contents

Foreword

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

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

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Introduction

IMS based services can be provided with use of PS bearers and CS bearers for the media. When using CS bearer for media transport of IMS sessions, interworking solutions for IMS Centralized Services as specified in TS 23.292 [5] are used. ICS allows IMS sessions using CS bearers to be treated as standard IMS sessions for the purpose of IMS Service Continuity. ICS defines signalling mechanisms between the UE and IMS for transport of information as needed for service continuity when using CS access for media transport.

Both IMS Centralized Services and IMS Service Continuity specify functions which are provided by a SIP application server.

1 Scope

The present document specifies the architectural requirements and procedures for delivery of IMS Service Continuity.

TS 23.206 [3] is migrated to this specification.

The scope of the specification includes:

- Access Transfer related functionality:
  - PS-CS Access Transfer;
  - PS-PS Access Transfer;
  - PS-PS Access Transfer in conjunction with PS-CS Access Transfer;
  - Adding and/or removing media flows to support service;
  - . MSC Server assisted mid-call feature;
  - SRVCC session transfer of IMS emergency session.
- Inter-UE transfer related functionality:
  - Establishment and release of a Collaborative Session;
  - Addition of media flows to, modification of media flows in, and release of media flows from a Collaborative Session;
  - Transfer of media flows to a target UE whilst keeping Collaborative Session control in the Controller UE;
  - Transfer of all media flows to a target UE without establishing a Collaborative Session.

The solution is restricted to service continuity using IMS procedures, i.e. mobility mechanisms on the IP-CAN level are not within the scope of this specification.

2 References

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

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

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

[2] 3GPP TS 22.258: "Service requirements for the AIPN".

[3] 3GPP TS 23.206: "Voice Call Continuity between CS and IMS".

[4] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[5] 3GPP TS 23.292: "IP Multimedia Subsystem (IMS) centralized services; Stage 2".

[6] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[7] OMA-ERELD-DM-V1_2-20060602-C: "Enabler Release Definition for OMA Device Management, Candidate Version 1.2".

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

[9] 3GPP TS 22.101: "Service aspects; Service principles".

[10] 3GPP TS 23.216: " Single Radio Voice Call Continuity (SRVCC); Stage 2".

[11] 3GPP TS 33.102: "3G security; Security architecture".

[12] 3GPP TS 33.203: "Access security for IP-based services".

[13] 3GPP TS 23.218: "IP Multimedia (IM) session handling; IM call model; Stage 2".

[14] 3GPP TS 23.003: "Numbering, addressing and identification".

[15] 3GPP TS 22.173: "IP Multimedia Core Network Subsystem (IMS) Multimedia Telephony Service and supplementary services; Stage 1".

[16] 3GPP TS 24.610: "Communication HOLD (HOLD) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[17] 3GPP TS 24.605: "Conference (CONF) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[18] 3GPP TS 24.629: "Explicit Communication Transfer (ECT) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[19] 3GPP TS 24.647: "Advice Of Charge (AOC) using IP Multimedia (IM)Core Network (CN) subsystem; Protocol Specification".

[20] 3GPP TS 24.616: "Malicious Communication Identification (MCDI) using IP Multimedia (IM)Core Network (CN) subsystem; Protocol Specification".

[21] 3GPP TS 24.604: "Communication Diversion (CDIV) using IP Multimedia (IM)Core Network (CN) subsystem; Protocol specification".

[22] 3GPP TS 24.615: "Communication Waiting (CW) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol Specification".

[23] 3GPP TS 23.167: "IP Multimedia Subsystem (IMS) emergency sessions".

[24] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[25] 3GPP TS 24.147: "Conferencing using the IP Multimedia (IM) Core Network (CN) subsystem; Stage 3".

[26] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[27] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

[28] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions in TR 21.905 [1] and the following apply.

Access Leg: This is the call control leg between the UE and the SCC AS; also see TS 23.292 [5] for the definition of Access Leg for IMS sessions which use the CS media.

Access Transfer: Transfer at the IMS-level of one or more media paths of an ongoing IMS session on one UE between PS to CS access; or transfer at the IMS-level of both the signalling and the media path of an ongoing IMS session on a UE between different IP-CANs.

Collaborative Session: A set of two or more Access Legs and related media on two or more UEs sharing the same IMS subscription that are presented as one Remote Leg by the SCC AS.

Controllee UE: A UE that provides media flows for a Collaborative Session, and is subordinate to the Controller UE for session control.

Controller UE: The UE that controls a Collaborative Session, and whose service profile determines the services on the remote leg. The Controller UE may also provide media flows for a Collaborative Session.

Correlation MSISDN: An MSISDN used for correlation of sessions. See TS 23.003 [14] for more information.

IMS Service Continuity: A service of the IMS which supports the use of Session Transfer mechanisms to maintain service continuity in the event of terminal mobility and/or mobility between terminals for the case when such events are not hidden from the IMS session layer and thus service continuity could not otherwise be maintained.

Inter-UE Transfer: Transfer at the IMS-level of some or all of the media flows and/or service control across a set of UEs sharing the same IMS subscription.

NOTE: The transfer of all media flows and the control signalling from one UE to another is also known as Session Mobility as defined in TS 22.258 [2].

IP Multimedia Routing Number (IMRN): An IP Multimedia Routeing Number (IMRN) is a routable number that points to an SCC AS in the IM CN subsystem. See TS 23.003 [14] for more information.

Local Operating Environment Information: This is a set of parameters, which can include access network(s) conditions and other parameters implementation specific, which describe the local environment in which the UE is operating.

Remote Leg: This is the call control leg between the SCC AS and the remote party from the subscriber's perspective; also see TS 23.292 [5] for the definition of Remote Leg for IMS sessions which use the CS media.

Service Control Signalling Path: As defined in TS 23.292 [5].

Session State Information: Information of IMS session state sent by the SCC AS for enablement of PS-CS and CS-PS Access Transfer of IMS multimedia-sessions when ICS UE capabilities can not be used.

Session Transfer: Transfer at the IMS-level of one or more of the session signalling paths and/or associated media flow paths of an ongoing IMS session while maintaining service continuity. Session Transfer incorporates Access Transfer and / or Inter-UE Transfer.

Session Transfer Identifier (STI): An identifier used by the UE to request the SCC AS to perform Session Transfer. The STI is either statically configured on the UE or dynamically assigned. See TS 23.003 [14] for more information.

Session Transfer Number (STN): A number used by the UE to request the SCC AS to perform Session Transfer from PS to CS access. The STN is statically configured on the UE. See TS 23.003 [14] for more information.

Session Transfer Number for SRVCC (STN-SR): A STN used for SRVCC procedures as specified in TS 23.216 [10]. STN-SR is a subscription information provided to HSS provided to HSS for each subscriber if SRVCC service is allowed by hPLMN. STN-SR is a routing number indicating the SCC-AS. See TS 23.003 [14] for more information.

Source Access Leg: The Access Leg that exists in the transferred-out access before executing Access Transfer procedures.

Target Access Leg: The Access Leg that is established in the transferred-in access during Access Transfer procedures.

Emergency Session Transfer Number for SRVCC: A number used in the session transfer procedure for emergency calls, pointing toward the serving (visited if roaming) IMS EATF which handles the IMS emergency session transfer from PS to CS access.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 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 TR 21.905 [1].

3pcc	3rd party call control
C-MSISDN	Correlation MSISDN
EATF	Emergency Access Transfer Function
iFC	Initial Filter Criteria
IMRN	IP Multimedia Routing Number.
IUT	Inter-UE Transfer
OCS	Online Charging System
SC	Service Continuity
SCC AS	Service Centralization and Continuity Application Server
SRVCC	Single Radio Voice Call Continuity
STI	Session Transfer Identifier
STN	Session Transfer Number
STN-SR	Session Transfer Number - Single Radio
E-STN-SR	Emergency Session Transfer Number for SRVCC

4 High level principles and architectural requirements

4.1 Basic Assumptions

4.1.0 General

It is assumed that the UE may be capable of transmitting and receiving simultaneously in multiple Access Networks or it may be capable of transmitting and receiving in only one Access Network at a time.

4.1.1 PS-CS Access Transfer

The following assumptions apply for PS-CS Access Transfer:

- Functions of IMS Centralized Services and IMS Service Continuity are collocated in a single SCC AS. Not all functions are always required.
- IMS Centralized Services specifies functions and procedures for use of CS bearer for the media of the IMS sessions.
- If both UE and network supports the ICS UE capabilities described in TS 23.292 [5], these capabilities are used for communication of required information if needed for enablement of PS-CS Access Transfer of IMS multimedia sessions. During Access Transfer, the UE may decide to retain the use of the Gm reference point for service control of the real time media flow(s) in the old PS access (if available) or may decide to transfer the Gm service control for the real time media flow(s) to a new PS access. Support and use of the I1 interface in both the UE and SCC AS are subject to the requirements specified in clause 4.8 of TS 23.292 [5].
- When using the CS bearer for the media of the IMS session(s), multiple sessions can exist, but only one active session can be transferred over the CS bearer; one or more inactive sessions can be transferred.
- PS-CS Access Transfer with UE-based conferencing is not specified in this release.
- The SCC AS shall provide the Session State Information to the MSC Server if:
  - the Access Transfer request is sent by or via the MSC Server;
  - the MSC Server has indicated its capability to support mid-call services in the registration or indicates its capability in the Access Transfer request sent to the SCC AS;

- and ICS UE capabilities cannot be used upon transfer.

4.1.2 PS-PS Access Transfer

If a UE has an ongoing multimedia session over an access system and moves to a different access system but its IMS contact address and its serving P-CSCF remains the same, then there is no need to activate any IMS Service Continuity mechanisms to transfer its multimedia session. The UE may update the session (e.g. remove media type(s) not supported by the target access system) based on the normal IMS procedures specified in TS 23.228 [4].

When the Evolved Packet System mobility with IP address preservation is used, the assumption above also applies.

NOTE: If an ICS UE has an ongoing session using CS bearer and Gm reference point over an IP-CAN and performs an Access Transfer to a different IP-CAN, the Service Control Signalling Path can be transferred from the old IP-CAN to the new IP-CAN while retaining the media flow(s) in the CS access network, so that service continuity of the session is maintained.

4.1.3 Inter-UE Transfer

The following assumptions apply for Inter-UE Transfer:

- The UEs involved in Inter-UE Transfer share the same IMS subscription.
- The Collaborative Session control cannot be transferred between UEs.
- There is only one Controller UE within a Collaborative Session.
- A Controllee UE is not aware of its role within a Collaborative session and it is not aware of the Controller UE. In that respect any UE can undertake the role of Controllee UE.
- The Collaborative Session is transparent to the remote end, to which it appears that the session is with the Controller UE.
- The UEs involved in Inter-UE Transfer without establishing a Collaborative Session use Public User identities that share the same service profile.

NOTE: This Release does not provide a solution to enforce this assumption.

4.2 Architectural Requirements

4.2.1 General Requirements

- It shall be possible to perform multimedia session transfer between access systems regardless of whether network layer mobility is deployed or not.

NOTE: The mechanism to avoid potential conflict between PS-PS Access Transfer and underlying network layer mobility (e.g. Evolved Packet System mobility, etc.) is not specified within this Release of the specification.

- The service disruption when session transfer occurs shall be minimized.
- There shall be no impact on the radio and transport layers and on the PS core network.
- UEs that do not support the functionality described in this specification shall not be impacted.
- All media flow(s) within a multimedia session or a subset of media flow(s) within a multimedia session could be subject to session transfer procedures.
- It shall be possible to register a Public User Identity with multiple contact addresses (at the same or via separate UEs) via IMS registration procedures as defined in TS 23.228 [4], clause 5.2.1. The number of allowed simultaneous registrations is defined by home operator policy.

- It shall be possible to perform correlation of charging data from different access networks when service continuity between these networks is performed.
- The UE shall be IMS registered before invoking any Session Transfer procedures.
- The filter criteria shall contain a condition that a 3rd-party registration is performed via the ISC interface for the SCC AS.
- It shall be possible to provide SR-VCC support for IMS emergency call.

4.2.2 Access Transfer Requirements

- It shall be possible to provide Access Transfer when the user is moving between 3GPP access systems.
- It shall be possible to provide Access Transfer when the user is moving between 3GPP and non-3GPP access systems.
- It shall be possible to provide Access Transfer when the user is moving between non-3GPP access systems.
- It shall be possible to provide Access Transfer between an Access Network that supports real-time media on the CS domain and non-real-time media on the PS domain, and an IP-CAN that supports transport of all media types.
- If it is not possible or not desired (e.g. due to user preferences and/or operator policies) to transfer all the media flow(s), then a subset of the media flow(s) shall be transferred (if possible) and the remaining flow(s) will be released or kept in the transferred out access.
- It shall be possible for the UE to add or remove one or more media flow(s) to/from an ongoing multimedia session that it controls during Access Transfer.
- It shall be possible to provide Access Transfer when the P-CSCF changes.
- It shall be possible for the UE to use IMS mechanisms to transfer its ongoing multimedia sessions to a target Access Network without requiring any new functionality on the remote party.
- It shall be possible for the UE to initiate an Access Transfer procedure based on operator policy provided by the network which may include restrictions of Access Transfer.
- It shall be possible for the SCC AS to update the operator policy in the UE.

4.2.3 IUT Requirements

- IUT shall apply only for sessions that are already established.
- It shall be possible for the Controller UE to apply IUT when a remote end adds media to an existing session.
- IUT shall be able to coexist with Access Transfer as specified in this specification and TS 23.292 [5].
- If the Collaborative Session control is lost for an active Collaborative Session, the SCC AS shall release all the Access Legs participating in that Collaborative Session.
- It shall be possible for the Controller UE to determine all other UEs under the same subscription that are currently available for IUT procedures.
- It shall be possible for the Controller UE to determine the media and service capabilities of each available UE.
- The network shall reject IUT between UEs that are not under same subscription.
- The SCC AS shall maintain the end-to-end session service state of a UE engaged in IUT.
- It shall be possible to execute IUT in any order, and any number of times, for a given session.
- The Controller UE shall maintain the Collaborative Session control for the session until the Collaborative Session is released.

- The media flow(s) on the target UE shall be established using IMS session setup procedures as specified in TS 23.228 [4].
- The Controller UE may transfer one or more media flow(s) to one or more target UEs (including itself).
- The selection of the media flows to be transferred may be based on the target UE(s) capabilities.
- The Controller UE shall have information about a Collaborative Session, which describes all media components currently existing in this session and the UEs associated with these media components.
- The Collaborative Session procedures for a Controllee UE shall not have any impact to the UE. Therefore any IMS UE shall be able to act a Controllee UE within a Collaborative Session.
- The SCC AS shall prevent the Controllee UE to perform actions that are not allowed for its role (e.g. to add media to an existing session).
- UEs using CS access interworked with IMS by an interworking node shall be provided with limited Controllee UE functionality based on the constraints of the interworking node.
- After the local end changes due to an IUT procedure without establishing a Collaborative Session, the SCC AS shall update the remote end that the session is continuing with a new local end.

4.3 Service Continuity

4.3.1 Session Transfer concepts

4.3.1.1 General

When an UE is active in an IMS session, the Session Transfer procedures provide service continuity between Access Networks and between UEs under the same subscription.

The initial and all subsequent Session Transfer procedures are initiated by the UE and are executed and controlled by the same SCC AS.

The SCC AS generates charging information for all Session Transfers for an IMS session for the purpose of billing and charging.

The UE sends information required by the SCC AS in order to execute Session Transfer procedures.

4.3.1.2 Access Transfer concepts

4.3.1.2.1 General Access Transfer concepts

IMS sessions from and to an UE are anchored at the SCC AS in the home IMS to provide service continuity for the user during transition between two Access Networks. Sessions are anchored at the SCC AS in the home IMS, based on iFC. A 3pcc (3rd party call control) function is employed at the SCC AS to facilitate inter-Access Network mobility through the use of Access Transfers between the two Access Networks. Access Transfers may be enabled in one or both directions as per network configuration requirements. The SCC AS has the capability to perform Access Transfers for a UE's sessions multiple times.

Initiation of Access Transfer procedures for ongoing multimedia session may be based on the operator policy received from the SCC AS.

4.3.1.2.2 Access Transfer (PS – CS) concepts

IMS sessions established in CS or PS Access Networks are anchored at the SCC AS. IMS sessions using CS bearer are established at session setup or upon Access Transfer using procedures specified in TS 23.292 [5].

PS-CS Access Transfer shall be provided according to the requirements specified in clause 22.3, Service Continuity, of TS 22.101 [9].

When using a UE that does not have, or that is unable to use, ICS UE capabilities as specified in TS 23.292 [5], Access Transfer of one active bi-directional speech or speech and video session and zero or one inactive bi-directional speech session shall be provided when transferring speech and/or video media flow between CS and PS access. For PS to CS (not CS to PS) access transfer, if the UE has more than one anchored active bi-directional session, the session that was most recently made active shall be transferred.

When using a UE that is able to use ICS capabilities as specified in TS 23.292 [5], Access Transfer of one active bi-directional speech or speech and video session and zero or more inactive bi-directional speech sessions shall be provided using the Gm reference point, or optionally the I1 reference point, of ICS to transport required information, as specified in TS 23.292 [5], when transferring speech and/or video media flow between CS and PS access. For PS to CS (not CS to PS) access transfer, if the UE has more than one anchored active bi-directional sessions, then the UE shall first request transfer of one of the active bi-directional sessions, put the remaining active sessions on hold and then request the transfer of one of the remaining inactive bi-directional sessions. Access Transfer shall also be provided for one or more inactive bi-directional sessions if the UE has no active bi-directional sessions.

The SCC AS maintains, for all active and inactive sessions, Session State Information as defined in clause 4.3.3.

For PS to CS Access Transfer, if the Access Transfer request has been sent by MSC Server or by the UE through the MSC Server and if the MSC Server has indicated its capability and ICS UE capability cannot be used upon transfer, then the SCC AS shall provide Session State Information to the MSC Server enhanced for ICS or SRVCC as specified in TS 23.292 [5] and TS 23.216 [10], respectively. The SCC AS shall not provide Session State Information if either the UE or operator policy on the SCC AS indicates that network capabilities shall not be used to support mid-call services during Access Transfer. When receiving information about an additional session, the MSC Server enhanced for ICS or SRVCC shall initiate Access Transfer towards the SCC AS for the additional session. When receiving information for a session, the MSC Server shall create a service context for this session using this information and perform service control on behalf of the UE as specified in TS 23.292 [5].

For CS to PS Access Transfer initiated by a UE not able to use ICS capability, the SCC AS shall provide Session State Information to the UE on the transferring-in leg.

4.3.1.2.3 Co-existence of ICS UE and MSC Server assisted mid-call feature

The MSC Server assisted mid-call feature can only be triggered if UE, MSC Server, and SCC AS all have indicated support of the MSC Server assisted mid-call feature.

A UE may implement both ICS UE capability and the MSC Server assisted mid-call feature for situations when the ICS UE capabilities cannot be used or be maintained after the transfer. For such a scenario, if ICS UE indicates both capabilities then the SCC AS needs to determine which capabilities are used to transfer the additional active or inactive sessions. The following logic is applied in the SCC AS to achieve this:

- If the Access Transfer request is made using ICS UE capabilities, the SCC AS detects that ICS UE capabilities are used and executes the transfer according to procedures defined in clause 6.3.2 of the present document.
- If the Access Transfer request is made via the MSC Server, the SCC AS needs to determine whether ICS capabilities are used:
  - If the ICS UE is able to use ICS capabilities, then clause 6.3.2 of the present document applies.
  - If the ICS UE is not able to use ICS capabilities, then MSC Server assisted mid-call feature is used.

  The SCC AS can determine whether ICS capabilities are used based on the local configuration, or alternatively delay for an adequate time sending the session state information to the MSC Server in order to trigger the MSC Server assisted mid-call feature such that the potential re-establishment of Service Control Signalling Path by the ICS UE can be excluded.

4.3.1.3 Inter-UE Transfer concepts

4.3.1.3.1 General

IMS sessions from and to a UE are anchored at the SCC AS in the home IMS to provide service continuity for the user when one or more media flows of an ongoing IMS multimedia session are transferred, added or deleted among different UEs under the same subscription.

A Collaborative Session, which is split on the local end across two or more UEs and anchored in the SCC AS, is established due to the Inter-UE transfer procedures. The UE which initiates the Inter-UE Transfer procedures to establish the Collaborative Session becomes the Controller UE of the Collaborative Session and the other UE(s) involved in the Collaborative Session become the Controllee UE(s). Subsequent Inter-UE Transfer procedures, initiated by the Controller UE, can also be performed within the Collaborative Session. The SCC AS provides the coordination of the Collaborative Session procedures which may involve both the Controller UE and the Controllee UE(s).

Inter-UE Transfer procedures can also be executed without establishing a Collaborative Session. In this case, the whole IMS multi-media session is transferred from one UE to the other UE, and the roles of the Controller and Controllee UEs are not applicable.

Inter-UE Transfer procedures may be initiated by the UE based on the information it gets from Target UE discovery.

4.3.1.3.2 Controller UE and Controllee UE operations

4.3.1.3.2.1 Overview

The operations of Controller UE and Controllee UE are described respectively in clauses 5.3.2.2.2 and 5.3.2.2.3.

4.3.2 Void

4.3.3 Information used for IMS Service Continuity

The following information may be provided between SCC AS and the UE.

Depending on the IMS Service Continuity scenario, the Access Transfer request may contain the following:

- session transfer indicator;
- details about the access and the media flow(s) being transferred / kept / released;
- optionally, an IMS Communication Service Identifier defined in TS 23.228 [4];
- which session is required to be replaced or updated;
- whether to merge the session(s).

The above addressed information are carried in various SIP/SDP and CS call control messages (specified in the applicable information flows), which provides the necessary details to enable IMS Service Continuity. The SCC AS and the UE analyze the included information and determine if and how a Session Transfer operation needs to be performed.

The Session State Information sent by the SCC AS may contain the following about one active and zero or one inactive bi-directional speech session(s) for enablement of PS-CS service continuity of IMS multimedia-sessions:

- calling party;
- called party;
- needed STI;
- further session information (e.g. active, inactive, conference call initiator, conference URI, identifier of all participants) as required.

The above information is carried in SIP messages (specified in the information flows) providing the necessary details to enable MSC Server assisted mid-call feature.

5 Architecture model and reference points

5.1 Overview

IMS Service Continuity is a home network based IMS application which provides intra-UE transfers of one or more components of IMS multi media sessions across different Access Networks. In addition, Service Continuity enables adding, deleting, and transferring media flows of IMS multi-media sessions or transferring whole IMS multi-media sessions across multiple UEs belonging to the same IMS subscription.

NOTE: For IMS emergency service, IMS Service Continuity is a serving network (visited if roaming) based IMS application.

The UE shall not invoke Inter-UE Transfer procedures while engaged in an emergency call.

5.2 Reference Architecture for non emergency session

IMS Service Continuity requires a Service Centralization and Continuity (SCC) AS, which is an Application Server as described in TS 23.228 [4], and a UE with SC capabilities. For the support of IMS sessions with CS media, refer to the reference architecture in TS 23.292 [5], clause 5.2; the functions of ICS and SC are specified as optional functions co-located in the SCC AS in this release.

OMA Device Management [7] is used between the SCC AS and the UE for provisioning of operator policy for Access Transfer.

5.3 Functional Entities

5.3.1 SCC AS

The SCC AS provides IMS-based mechanisms for enabling service continuity of multimedia sessions.

For IMS Service Continuity, the SCC AS implements the following functionalities:

- **Access Transfer**: The SCC AS uses the ISC reference point towards the S-CSCF for execution of the Access Transfer. The SCC AS performs the following for enablement and execution of Access Transfers:
  - analyzes the information required for Access Transfer as described in the procedure section and decides which Access Transfer scenario should be executed; it rejects the Access Transfer request if it is not aligned with the operator policy;
  - may retrieve from the HSS after third party registration the C-MSISDN bound to the IMS Private User Identity stored in the user profile in the HSS;
  - correlates the Access Transfer request with the anchored session, using information provided in the incoming SIP INVITE;
  - executes the transfer of the IMS session between different access networks;
  - implements 3rd party call control (3pcc) upon session establishment;
  - provides Access Transfer specific charging data;
  - decides based on analysis of the various service continuity related input factors, whether to update provisioned operator policy for Access Transfer;
  - generates and updates operator policy by sending operator policy to the UE via OMA DM [7] including the priority between the operator policy and user preferences that could be used also to initiate Access Transfer procedure for ongoing sessions.
- **Inter-UE Transfer:** The SCC AS performs the functions for enablement and execution of Inter-UE Transfer procedures:

- executes the IMS Inter-UE Transfer related procedures between different UEs belonging to the same IMS subscription connected via the same or different access networks;
- provides Inter-UE Transfer specific charging data.

- **Terminating Access Domain Selection (T-ADS):** In addition to T-ADS specified in TS 23.292 [5].

  For a terminating session, the SCC AS may select more than one contact amongst multiple registered contacts for each selected UE of the SC User and may split the session into sessions directed to the selected contacts.

  For multiple contacts in the PS domain, the SCC AS shall be able to select one or more types of access networks through which the session shall be terminated. In this case, the SCC AS includes additional information within the session request(s) to ensure that the corresponding session is terminated via the selected access network type(s).

  For Inter-UE Transfer procedures to a target UE, the SCC AS shall execute T-ADS to select one or more contacts to establish one or more access legs or to reuse one or more access legs belonging to the same Collaborative Session towards the target UE for the transferred media flow(s).

  T-ADS in SCC AS may be used in order to enforce user preferences between 3GPP and non-3GPP access networks.

  UE assisted T-ADS (UE T-ADS) may be used in order to enforce user preferences for CS bearer or PS bearer for voice/video on 3GPP accesses.

- **Handling of multiple media flows:** The SCC AS provides functionality to combine and/or split media flows over one or more Access Networks as needed for Session Transfers, session termination, or upon request by the UE to add media flows over an additional Access Network during the setup of a session, or upon request by the UE to add and/or delete media flows over one or more Access Networks to existing sessions.

  When handling media flows of an IMS session, the SCC AS takes into account the services associated with the session.

5.3.2 IMS Service Continuity UE

5.3.2.1 Access Transfer Functions

For supporting Access Transfer, the UE provides the following functions:

- Stores and applies operator policy for Access Transfer.
- Initiates Access Transfer procedure based on trigger criteria including the current operator policy, user preferences and the Local Operating Environment Information, providing the necessary details for conducting an Access Transfer operation to the SCC AS.

5.3.2.2 IUT Functions and Roles

5.3.2.2.1 Functions

For supporting Inter-UE Transfer, the UE may provide the following functions:

- Discovers the target UE(s) for Inter-UE Transfer;
- Initiates Inter-UE Transfer procedures based on user input.
- Takes the role of a Controller UE within a Collaborative Session.

Any IMS UE can take the role of a Controllee UE.

5.3.2.2.2 Controller UE Role

- The Controller UE can initiate the addition of a media flow to a Collaborative Session, on any of the Controllee UEs already involved in the collaborative session.

- The Controller UE can initiate the modification of a media flow that is part of a Collaborative Session it controls.
- The Controller UE can initiate the release of a media flow that is part of a Collaborative Session it controls.
- The Controller UE keeps track of all the UEs and about the state of the media flows which are part of a Collaborative Session it controls. That means it remains aware about the media flows that are established, as well as about the media used for those.
- The Controller UE is the one to accept or refuse requests for media additions initiated by the remote party for a Collaborative Session it controls. In case it accepts a remote party initiated media addition, the controller decides on which terminal the media shall be added.
- The Controller UE for a Collaborative Session can initiate Inter-UE transfer of one or more of the media flows of the Collaborative Session.
- The Controller UE can initiate the release of a Collaborative Session.
- The Controller UE can add into a Collaborative Session it controls a UE not yet involved in this Collaborative Session.

5.3.2.2.3 Controllee UE

Any IMS UE can take the role of a Controllee UE. In this role the Controllee UE can:

- initiate the modification of a media flow which terminates on it.
- initiate the release of a media flow which terminates on it.
- accept or refuse:
  - media modifications initiated by the remote party or by the Controller UE, for media flow(s) it terminates;
  - media additions initiated by the Controller UE or by a remote party (in the latter case, this assumes that the Controller UE has accepted the addition and selected the Controllee UE);
  - media transfers initiated by the Controller UE, for which the Controllee UE is the target.

5.3.3 Emergency Access Transfer Function (EATF)

The Emergency Access Transfer Function (EATF) provides IMS-based mechanisms for enabling service continuity of IMS emergency sessions. It is a function in the serving (visited if roaming) IMS network, providing the procedures for IMS emergency session anchoring and PS to CS Access Transfer. The EATF acts as a routing B2BUA which invokes third party call control (3pcc) for enablement of Access Transfer.

The EATF performs the session continuity when the Access Transfer request indicated by the E-STN-SR is received.

5.4 Signalling and bearer paths for IMS Service Continuity

5.4.1 General

The SCC AS is inserted in the signalling path of all the IMS user's sessions; the SCC AS behaves as a SIP-AS as described in TS 23.228 [4] to set up a 3pcc to control the bearer path of the session for enablement and execution of Session Transfer.

5.4.2 Sessions with PS media flow(s)

Figure 5.4.2-1 shows 3pcc at the SCC AS, for enablement and execution of Session Transfers, when the media flow(s) for the Access Leg is established via IP-CAN.

The figure is for illustration of the 3pcc at the SCC AS and its use for Session Transfer; hence it only shows the signalling and bearer components relevant to the enablement and execution of Session Transfers.

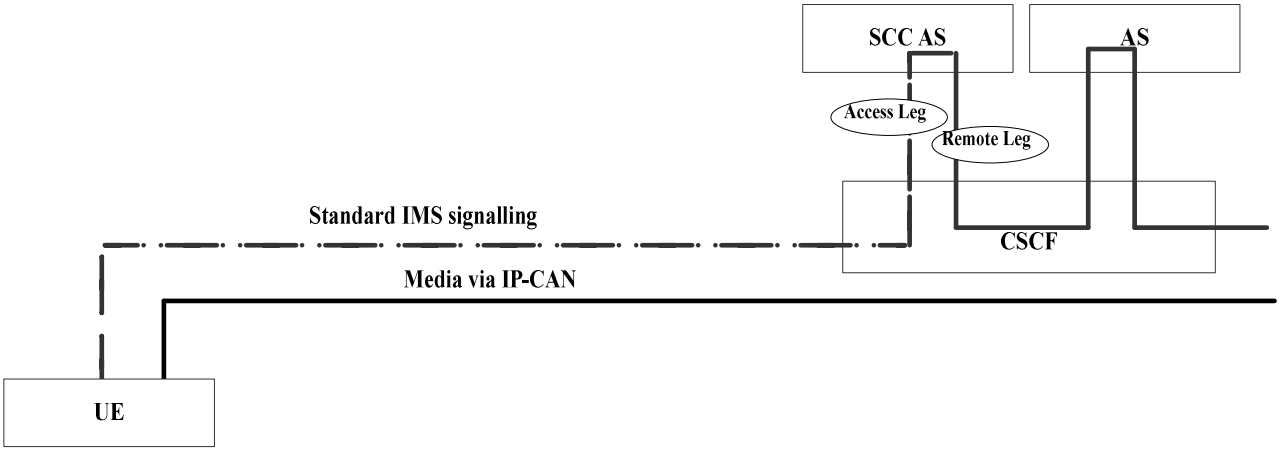

Figure 5.4.2-1: Signalling and bearer paths for sessions with PS media

5.4.3 Sessions with CS media

For details of signalling and bearer paths when the media for the Access Leg is established via the CS access, see TS 23.292 [5], clause 7.1.1. For illustration of 3pcc at the SCC AS, for enablement and execution of Session Transfers, with use of the Gm reference point, the I1 reference point and when not using Gm or I1 for service control signalling respectively, refer to figures 7.1.1-1, 7.1.1-2 and 7.1.2-1, in TS 23.292 [5], clause 7.1.

5.5 IUT Collaborative Sessions

IUT for service continuity allows a multi media session to be split on the local end across two or more UEs that are part of a Collaborative Session. Figure 5.5-1: Collaborative Session Signalling and Bearer architecture provides signalling and bearer architecture for a Collaborative Session.

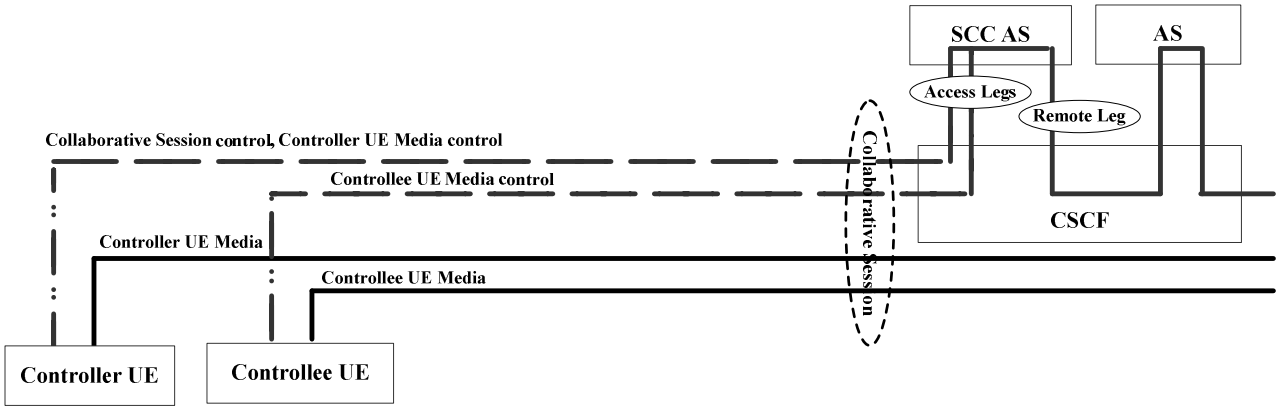

Figure 5.5-1: Collaborative Session Signalling and Bearer architecture

NOTE: The media in Controller UE is optional.

The Controller UE provides the control for a Collaborative Session using IMS signalling on an Access Leg between Controller UE and the SCC AS. The Controller UE may transfer one or more media flow(s) to one or more target UEs (including itself), by using Collaborative Session control (e.g. in the SDP).

Controllee UE provides the control for the media established on the Controllee UE using IMS signalling on the Access Leg associated for the media. For simplicity only one Controllee UE is shown but there can be multiple Controllee UEs.

The SCC AS combines the media descriptions and Collaborative Session control on the Access Legs and presents one Remote Leg towards the remote end.

5.6 Reference Architecture for SRVCC emergency session

To allow SRVCC for IMS emergency session, an EATF is used for emergency sessions anchoring and transferring. For the overall IMS emergency reference architecture with EATF, refer to the reference architecture in TS 23.167 [23].

6 Procedures and flows for Access Transfer

6.0 Introduction

Some of the following figures contain a box labelled CS/IMS Intermediate Nodes. This is abstraction for CS/IMS functional elements that exist between the UE and the SCC AS which could include amongst others MSC Server enhanced for ICS, MSC Server enhanced for SRVCC or an MGCF and an MSC Server not enhanced for ICS.

6.1 Registration

Whenever the UE acquires IP connectivity via an IP-CAN, the UE registers in the IMS as defined in TS 23.228 [4]. The user profile contains a C-MSISDN which is bound to the IMS Private User Identity. The S-CSCF follows the procedures defined in TS 23.218 [13] for performing 3rd party registration towards the SCC AS.

When using CS access for media, the UE may be registered in IMS as specified in TS 23.292 [5].

When the SCC AS receives a 3rd party registration per procedures defined in TS 23.218 [13], the SCC AS shall obtain the C-MSISDN from the HSS. If the C-MSISDN is associated with any ongoing session(s), the SCC AS shall bind all the unique identities associated with the SIP Registration e.g. GRUUs, contact address, etc with the session identifier of the ongoing session.

6.2 Origination and Termination

6.2.1 Origination

6.2.1.1 Origination Procedures

UE initiated multimedia sessions are anchored at the SCC AS in order to enable IMS Service Continuity. Originating iFC for the SC subscriber results in routing of the session to the SCC AS in the home IMS network, where the SCC AS uses 3rd party call control as per TS 23.228 [4] to initiate a session to the remote party on behalf of the subscriber.

The SCC AS shall be the first Application Server of any Application Servers that need to remain in the path of the call after Session Origination.

6.2.1.2 Originating sessions that use CS media

The UE originates sessions that use CS media by following the procedures specified in TS 23.292 [5], clause 7.3.2 Originating sessions that use CS media.

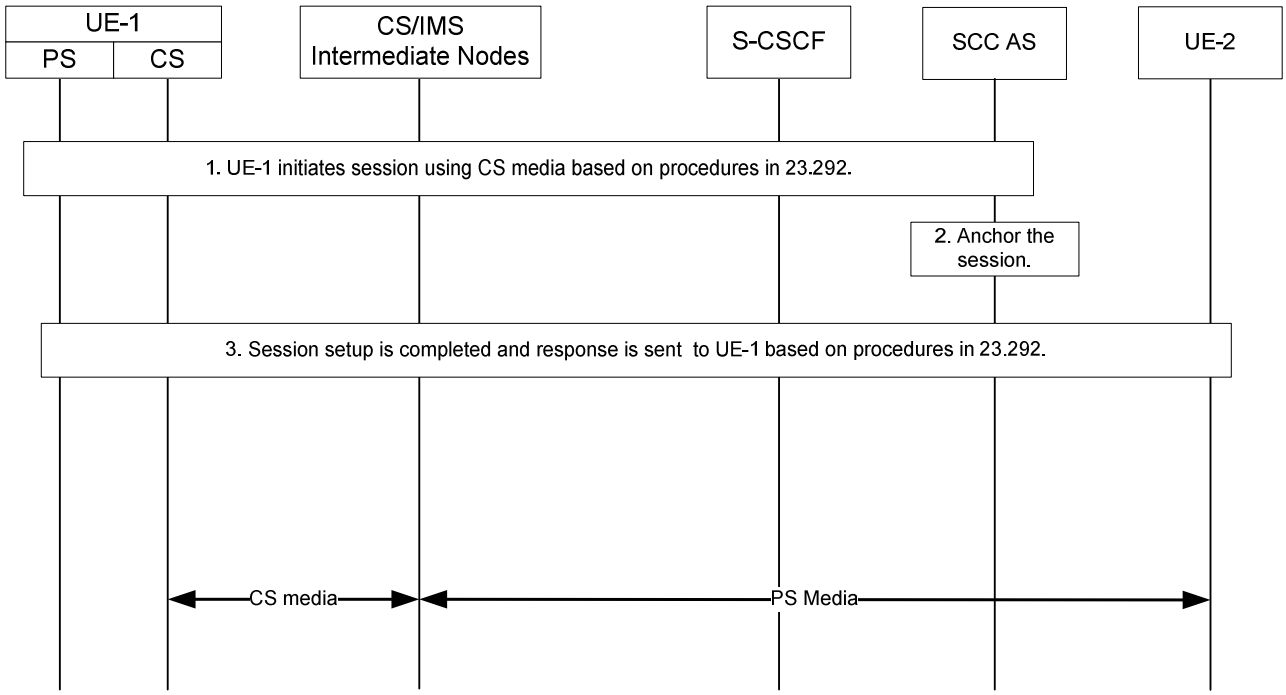

Figure 6.2.1.2-1: Originating session that uses CS media

1. UE-1 initiates a multimedia session to UE-2 and makes use of CS media. UE-1 sends the request to the SCC AS following the procedures specified in TS 23.292 [5], clause 7.3.2 Originating sessions that use CS media, for setting up CS bearer, anchoring the session at the SCC AS, merging multiples legs if necessary, and forwarding the combined session request to UE-2.

2. The SCC AS anchors the session. A dynamic STI is assigned for the anchored session.

3. The SCC AS completes session setup to UE-2 and sends a response to UE-1 based on the procedures specified in TS 23.292 [5]. The dynamic STI is communicated between the SCC AS and UE-1 if possible.

   The session is set up with CS media. The session may also include PS media flow(s).

6.2.1.3 Originating sessions that use only PS media flow(s)

Existing Mobile Origination procedures described in TS 23.228 [4] are used to establish a session.

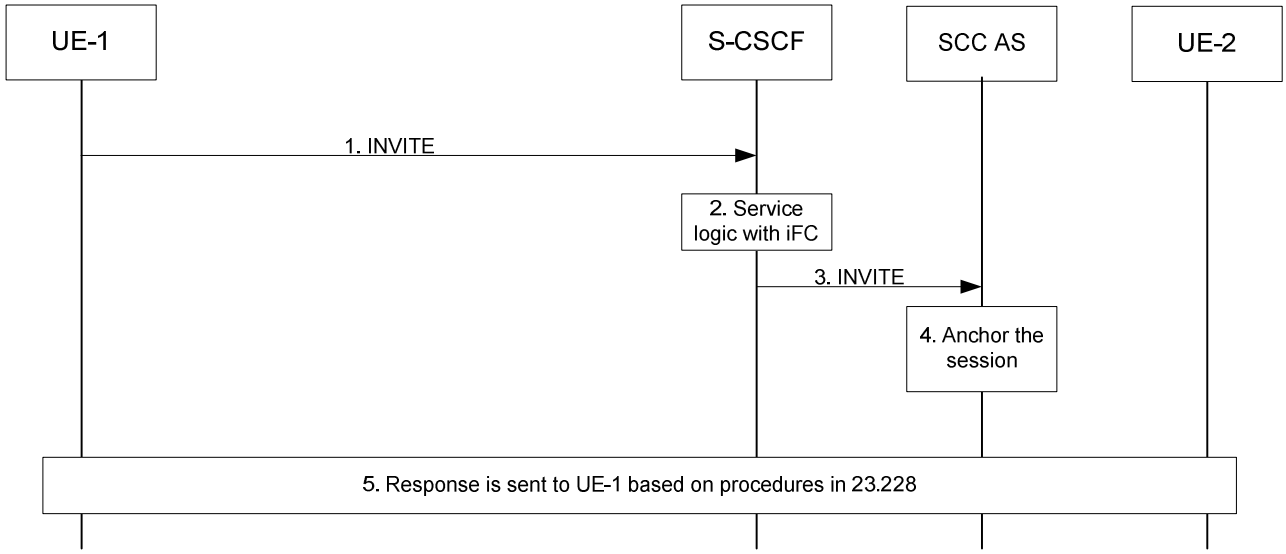

Figure 6.2.1.3-1: Originating session that uses only PS media

1. UE-1 initiates an IMS multimedia session to UE-2 and uses only PS media flow(s). The request is forwarded to S-CSCF following normal IMS session set up procedures.

2~3. The service logic with iFC causes the request to be forwarded to the SCC AS for anchoring the sessions to enable Session Transfer.

4. The SCC AS anchors the session. An STI is assigned for the anchored session.

5. The SCC AS completes the session setup to UE-2 and sends a response to UE-1.

6.2.2 Termination

6.2.2.1 Termination Procedures

IMS multimedia sessions towards SC subscribers in the PS or in the CS domain are anchored at the SCC AS to enable IMS Service Continuity. The execution of terminating iFC results in routing of the sessions to the SCC AS in the home IMS network, where the SCC AS uses 3rd party call control as per TS 23.228 [4] to terminate the session to the SC subscriber. The sessions may be delivered to the UE via the PS or CS access.

The SCC AS shall be the last Application Server of any Application Servers that need to remain in the path of the call after Session Termination.

6.2.2.2 Terminating sessions that use CS media

The procedures specified in TS 23.292 [5], clause 7.4.2 Terminating sessions that use CS media shall be followed to terminate sessions that use CS media to the SC subscriber.

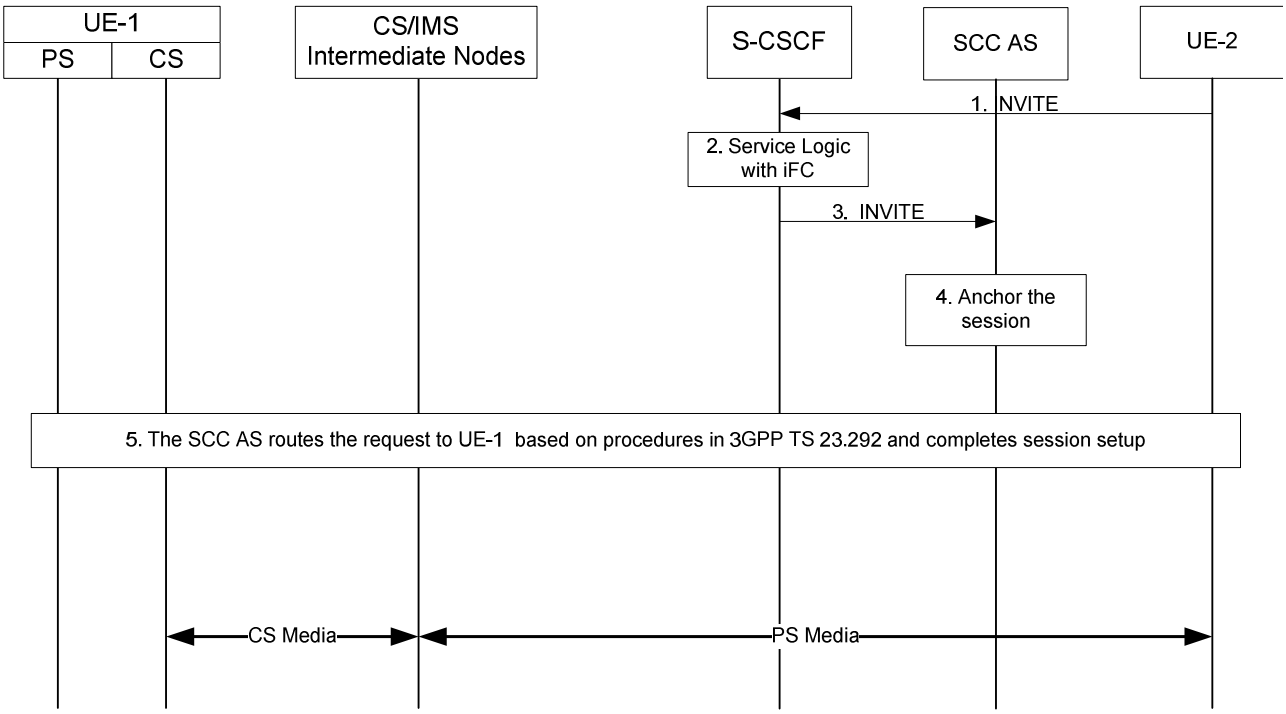

Figure 6.2.2.2-1: Terminating session that uses CS media

1. A request is received at S-CSCF serving UE-1 following standard IMS session set up procedures.

2 ~ 3. The service logic with iFC causes the request to be forwarded to the SCC AS so that the session is anchored for enabling Session Transfer.

4. The SCC AS anchors the incoming session. A dynamic STI is assigned for the anchored session.

5. The SCC AS forwards the request to UE-1 based on the procedures specified in TS 23.292 [5] for setting up CS bearer and splitting the media flow(s) if necessary. The dynamic STI is communicated between the SCC AS and

the UE if possible. If the SCC AS decided to split the non-speech media and speech media for a certain UE, the T-ADS in the SCC AS delivers the split session only to this particular UE. The SCC AS uses the C-MSISDN for correlation.

The session is set up with CS media. The session may also include PS media flow(s).

6.2.2.3 Terminating sessions that use only PS media flow(s)

Existing Mobile Termination procedures described in TS 23.228 [4] are used to establish a session towards a SC subscriber.

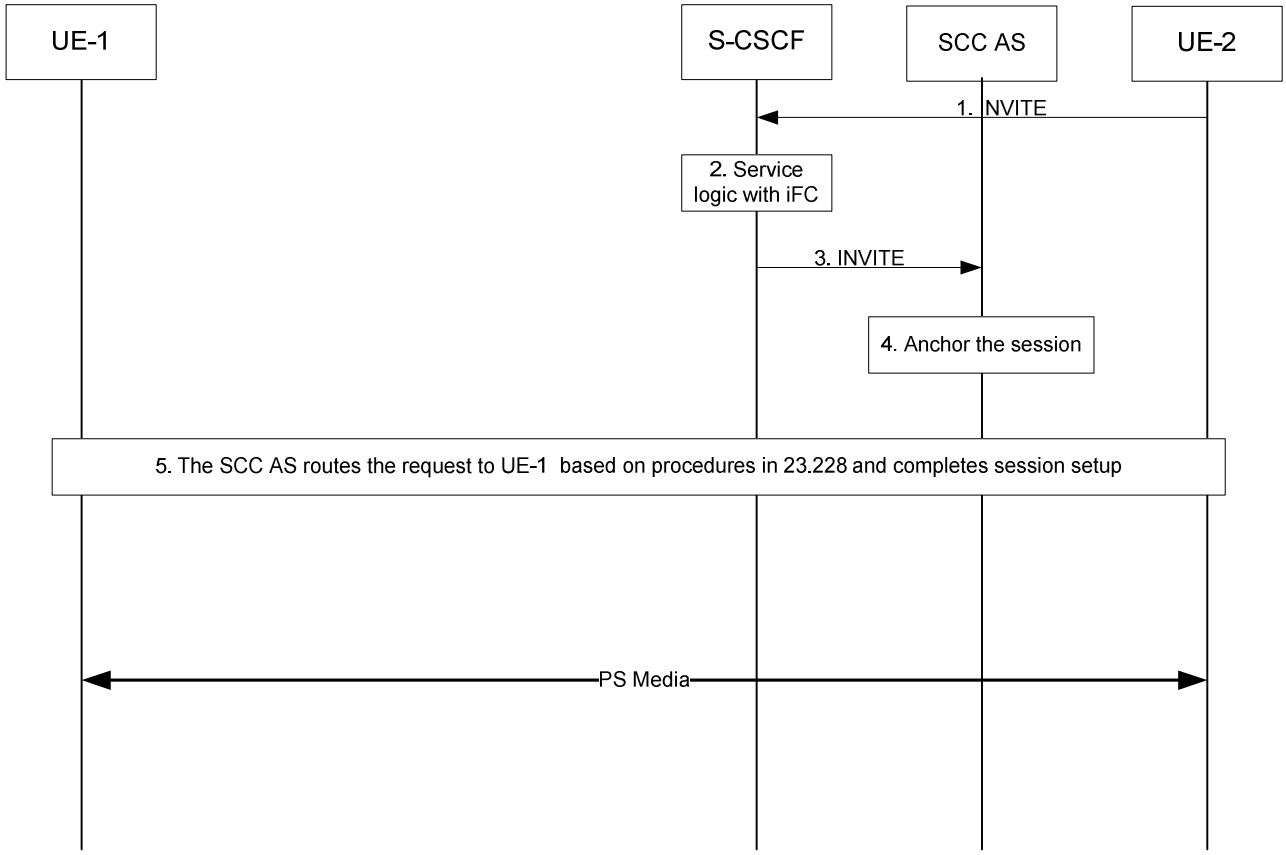

Figure 6.2.2.3-1: Terminating session that uses only PS media

1. The request is received at S-CSCF following normal IMS session set up procedures.

2 ~ 3. The service logic with iFC causes the request to be forwarded to the SCC AS so that the session can be anchored for potential session transfer.

4. The SCC AS anchors the session. An STI is assigned for the anchored session.

5. The SCC AS determines that the session is terminated to UE-1 with PS media flow(s) only and routes the request to UE-1.

6.2.2.4 Terminating sessions over Gm where speech media is not accepted by the UE

If the SCC AS includes only bi-directional speech media, the procedures specified in TS 23.292 [5], clause 7.4.3 shall be followed.

If the SCC AS includes non-speech media in the request, in addition to bi-directional speech or CS media and if the UE decides to only accept the non-speech media, the UE returns a response to IMS that only bi-directional speech or CS media is rejected. The SCC AS, upon reception of the response, splits the non speech media from the bi-directional

speech or CS media for this UE. The T-ADS in the SCC AS re-attempts the terminating call setup directly towards the same UE over CS domain if possible. The SCC AS uses the C-MSISDN for correlation.

6.3 Access Transfer

6.3.1 Access Transfer Procedure

6.3.1.1 Introduction

Access Transfer procedures enable service continuity between Access Networks. All Access Transfer procedures associated with a session, including initial and subsequent transfers, are executed and controlled in the user's home IMS network by the SCC AS upon the UE's request.

NOTE: In order to support Access Transfer and Media Adding/Deleting procedures that involve the use of the Gm reference point on two IP-CANs, the UE and IMS network both have to support multiple simultaneous registrations of the UE and the UE has to be able to establish and maintain simultaneous connections to both IP-CANs at least for the duration of the Access Transfers or Media Adding/Deleting procedures.

The STN and STI are used during the execution of Access Transfers. The STN and STI are stored in the UE.

6.3.1.2 Access Transfer Procedures

When the UE determines that Access Transfer is desirable and possible, a registration in IMS is performed by the UE via the transferring-in Access Network if the user is not already registered via that network.

If the UE does not have or is unable to use its ICS capabilities, then prior to dual-radio Access Transfer:

- If the MSC assisted mid-call feature is not used then the UE releases all but the most recently active bi-directional sessions.
- If the MSC assisted mid-call feature is used then:
  - if the UE has more than one active bi-directional session, selects the second most recently active bidirectional session and it releases all remaining sessions except for the two most recently active bi-directional sessions;
  - if the UE has one active bi-directional session and more than one inactive bi-directional session, it releases all sessions except for the active session and the inactive session which became inactive most recently.

NOTE: For the single-radio case the above applies but the UE locally releases the sessions based on the aforementioned priority.

A new Access Leg is established by the UE toward the SCC AS, if needed. Signalling and bearer resources are allocated in the transferring-in Access Network and the user's sessions are transferred from the transferring-out Access Network. The SCC AS executes Access Transfer procedures. Resources in the transferring-out Access Network are subsequently released.

When the UE wants to perform Access Transfer and determines that there is a PS Access Leg in the transferring-in Access Network for the same session, the UE can use the existing PS Access Leg in the transferring-in Access Network, instead of establishing a new Target Access Leg, to execute Access Transfer. No new signalling resources need to be allocated in the transferring-in Access Network.

Based on UE and Access Network capabilities, the UE may also maintain some of the media flows in the transferring-out Access Network while transferring the other media flows to the transferring-in Access Network.

6.3.1.3 Enablement of Access Transfer procedures

A 3pcc (3rd party call control) function is employed to anchor IMS sessions at the SCC AS upon session establishment for enablement of Access Transfer. The SCC AS is invoked as part of originating or terminating iFC execution at the subscriber's S-CSCF. The SCC AS inserts itself in the signalling path of the SC subscriber's IMS sessions by implementing a 3pcc (3rd party call control) function. For an originating IMS session, the SCC AS terminates an

Access Leg from the user and establishes a Remote Leg toward the remote end. For a terminating IMS session, the SCC AS terminates a Remote Leg from the remote end and establishes an Access Leg toward the user. The SCC AS subsequently coordinates the session control signalling exchange between the Access Leg and the Remote Leg associated with the anchored IMS session.

For 3pcc at the SCC AS when the Access Leg is established with CS media, refer to clause 5.4.3. For 3pcc at the SCC AS when the Access Leg is established with media flow over IP-CAN to illustrate its use as preparation for Access Transfer procedures, refer to clause 5.4.2.

An STI and STN for Access Transfer between CS and PS access shall be statically configured on the UE regardless of its ICS capabilities.

If the Gm or I1 reference point is used for the originating or terminating session, an STI is dynamically assigned for the Access Leg. An STI shall also be dynamically assigned for each new Access Leg established during Access Transfer.

NOTE: The dynamically assigned STI needs to be different from the STI and STN that are statically configured on the UE.

The statically configured STI shall be used for CS to PS Access Transfers only when no dynamically assigned STI was provided to the UE.

The STN is used for PS to CS Access Transfers when no Gm or I1 reference point is available.

The STN-SR as specified in TS 23.216 [10] is used for PS to CS Access Transfer using Single Radio VCC.

6.3.1.4 Execution of Access Transfer procedures

Upon detection of conditions requiring Access Transfer, the UE establishes a Target Access Leg with the SCC AS via the transferred-in Access Network to request Access Transfer to the transferred-in Access Network. When the UE initiates a Access Transfer request, it includes the STI and/or the STN.

The SCC AS executes the Access Transfer procedure by replacing the Source Access Leg currently communicating to the Remote Leg with the Target Access Leg. If no media flow is retained in the transferred-out access, the Source Access Leg is released as specified in clause 6.3.1.6. If the UE chooses to retain some media flow(s) in the transferred-out access, the Source Access Leg is updated to indicate which media flow(s) is retained in the transferred-out access. If such update is not done, the SCC AS releases the Source Access Leg as specified in clause 6.3.1.6 and updates the Remote Leg if necessary. When the switch of the Source Access Leg to the Target Access Leg is executed, the Remote Leg is also updated in order to forward the media flow(s) to the transferred-in Access Network.

6.3.1.5 Remote Leg Update

Upon receiving a request for execution of Access Transfer, the SCC AS performs the Remote Leg Update by switching the Access Leg communicating with the Remote Leg from Source Access Leg to Target Access Leg.

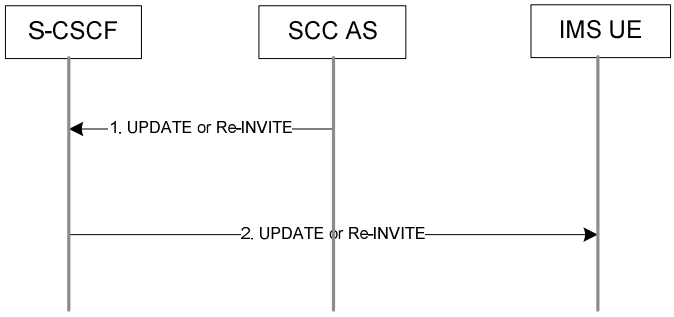

Figure 6.3.1.5-1: Remote Leg Update

The remote end in figure 6.3.1.5-1 represents a UE supporting terminations per TS 23.228 [4] (i.e. including NI-T).

1-2. The SCC AS updates the Remote Leg by communicating the SDP of the Target Access Leg established to the remote end via the user's S-CSCF. Remote Leg Update happens according to SIP session modification procedures (see RFC 3261 [8]).

The remote end in figure 6.3.1.5-2 represents an MGCF for CS/PSTN Remote Party.

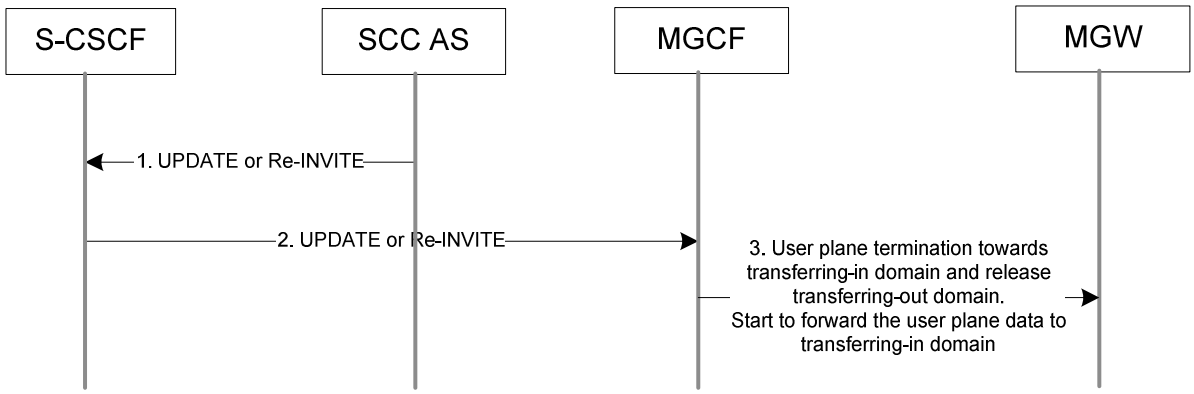

Figure 6.3.1.5-2: Remote Leg Update

1-2. These steps are the same procedures described in figure 6.3.1.5-1.

3. MGCF instructs MGW to update a termination towards the Target Access Leg to the context, and to release the termination for the Source Access Leg from the context.

6.3.1.6 Source Access Leg Release

When the session modification procedures are complete, the Source Access Leg Release is executed by initiating a session release. This is done for the Source Access Leg using the AS/UE session release procedures per TS 23.228 [4]. The UE and the SCC AS shall initiate the Session Release procedure when the switch to the Target Access Leg is complete.

6.3.2 Access Transfer Information flows

6.3.2.0 General

This clause details the procedures and flows for Access Transfers. In the flows that pertain to I1, the assumptions specified in clause 7.0 of TS 23.292 [5] apply.

6.3.2.1 PS – CS Access Transfer

6.3.2.1.1 PS – CS Access Transfer: PS to CS - Dual Radio

Figure 6.3.2.1.1-1 PS – CS Access Transfer: PS to CS - Dual Radio, provides an information flow for Access Transfer of an IMS session in PS to CS direction. The flow requires that the user has an IMS originating or terminating session using PS media flow(s) at the time of initiation of Access Transfer to CS.

NOTE 1: This flow assumes the PS domain does not have any non real time media flow(s). If the PS domain has other non real time media flow(s), then the call flow in clause 6.3.2.3.1 applies.

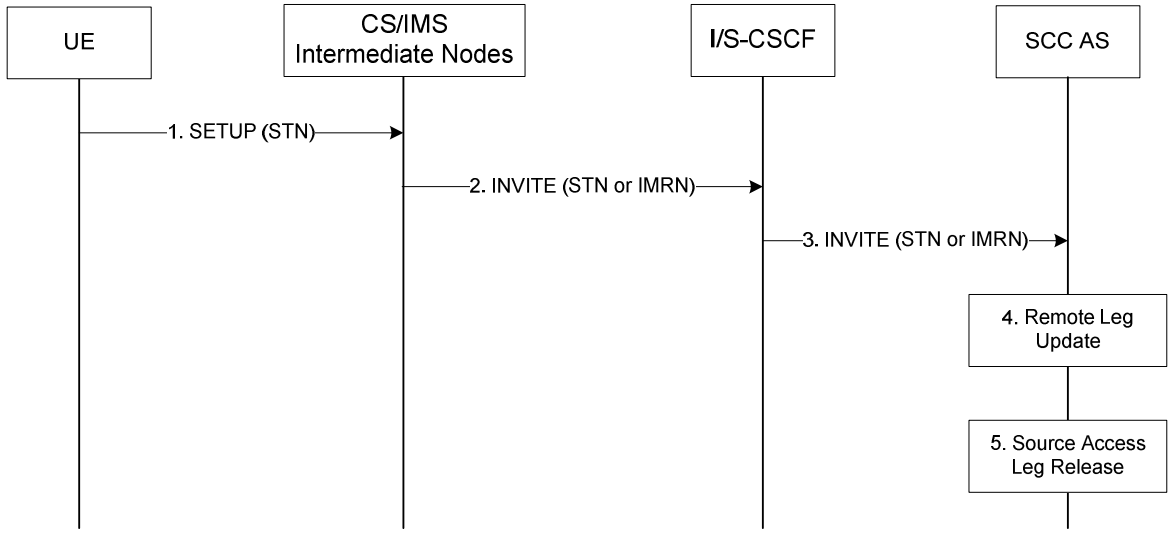

Figure 6.3.2.1.1-1: PS – CS Access Transfer: PS to CS - Dual Radio

1. If the user is not attached to the CS domain at the time when the UE determines a need for Access Transfer to CS, the UE performs a CS Attach as specified in TS 23.292 [5], clause 7.2.1. It subsequently originates a session that uses CS media using the STN to establish an Access Leg via the CS access and requests Access Transfer of the IMS session to CS access using the procedures described in TS 23.292 [5], clause 7.3.2 Originating Sessions that use CS media.

2. Standard procedures as specified in TS 23.292 [5], clause 7.3.2 Originating Sessions that use CS media are used in CS and IMS intermediate nodes which results in routing of the INVITE with the STN or an IMRN to the I/S-CSCF. The MSC Server enhanced for ICS includes the GRUU into the Access Transfer request if the user is registered in the IMS by the MSC Server enhanced for ICS as specified in TS 23.292 [5]. If the user is not registered in IMS then CS/IMS Interworking Nodes includes the C-MSISDN as calling party number into the Access Transfer request.

3. Standard procedures are used at I/S-CSCF for routing of the INVITE to the SCC AS.

4. The SCC AS completes the establishment of the Access Leg via the CS access. The SCC AS is able to identify the correct anchored session using either the C-MSISDN or the GRUU for session identification. The SCC AS determines if the state of the session to be transferred is active or inactive based on the session state information in the source Access Leg. The SCC AS performs the Access Transfer by updating the Remote Leg with the connection information of the newly established Access Leg using the Remote Leg Update procedure as specified in clause 6.3.1.5. The SCC AS completes the session setup towards UE according to procedures defined in TS 23.228 [4].

5. The Source Access Leg (which is the Access Leg previously established over PS access) is released as specified in clause 6.3.1.6

NOTE 2: Steps 4 and 5 consist of a sequence of messages, some of which may occur in parallel.

6.3.2.1.1a PS – CS Access Transfer: PS to CS – Dual Radio with Session State Information

Figure 6.3.2.1.1a-1 PS – CS Access Transfer: PS to CS – Dual Radio with Session State Information, provides an information flow for Access Transfer of an IMS session in PS to CS direction. The flow requires that the user has an active IMS originating or terminating session, together with at least one more IMS originating or terminating session (active and/or inactive), using PS media at the time of initiation of Access Transfer to CS and that the use of network capabilities to support MSC Server assisted mid-call feature during Access Transfer is supported by the UE and the network. It further requires that the MSC Server is enhanced to support the I2 reference point.

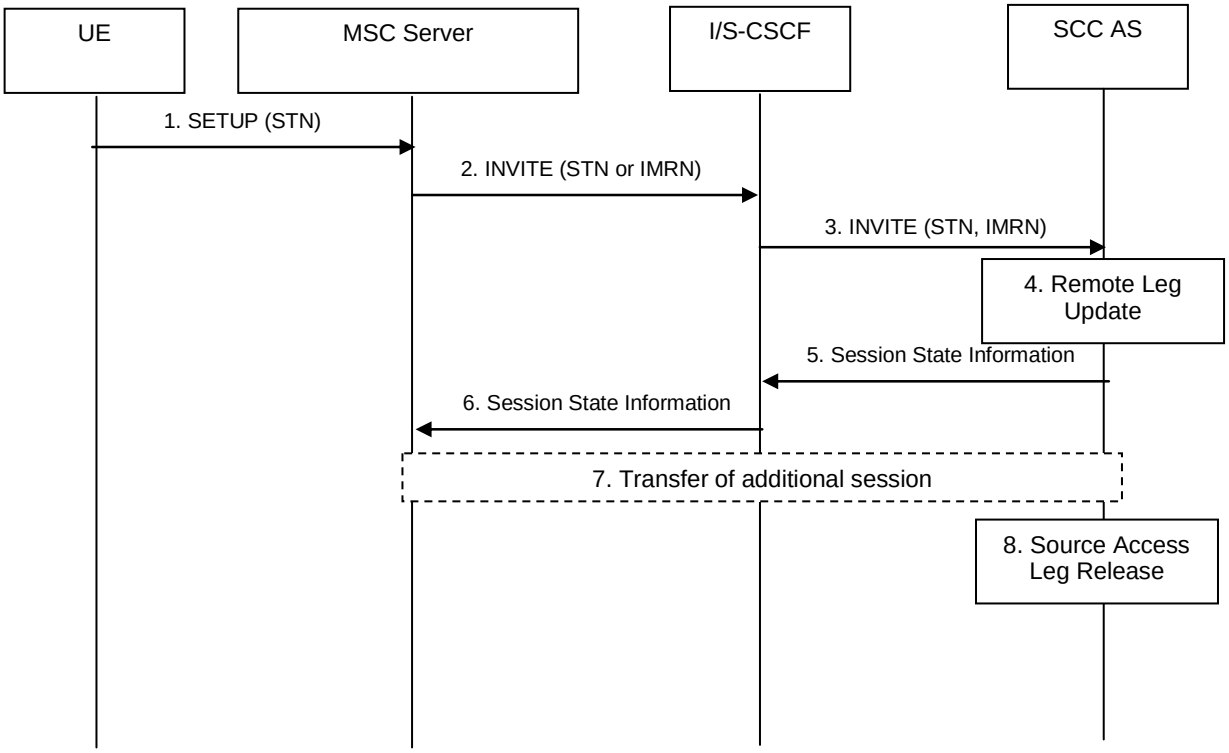

Figure 6.3.2.1.1a-1: PS – CS Access Transfer: PS to CS – Dual Radio with Session State Information

1. If the user is not attached to the CS domain at the time when the UE determines a need for Access Transfer to CS, the UE performs a CS Attach as specified in TS 23.292 [5], clause 7.2.1. It subsequently originates a session that uses CS media using the STN to establish an Access Leg via the CS access and requests Access Transfer of the IMS session to CS access using the procedures described in TS 23.292 [5], clause 7.3.2.

2. The procedures specified in TS 23.292 [5], clause 7.3.2, are used by the MSC Server, which results in routing of the INVITE with the STN to the I/S CSCF. The MSC Server includes the GRUU into the Access Transfer request, which can be used for session (and UE) correlation.

NOTE 1: The MSC Server enhanced for ICS obtains the GRUU during registration; the GRUU can be used for session (and UE) correlation.

NOTE 2: The MSC Server has indicated its capability to support MSC Server assisted mid-call feature during Access Transfer in the registration.

3. Standard procedures are used at I/S-CSCF for routing of the INVITE to the SCC AS.

4. The SCC AS completes the establishment of the Access Leg via the CS access. The SCC AS is able to identify the correct anchored session using the GRUU for session identification. The SCC AS performs the Access Transfer of the recently added active session or, if there is no active session, the inactive session which was active most recently, with bi-directional speech for the UE by updating the Remote Leg with the connection information of the newly established Access Leg using the Remote Leg Update procedure as specified in clause 6.3.1.5. The SCC AS completes the session setup towards the UE according to procedures defined in TS 23.228 [4].

5. The SCC AS provides Session State Information on the transferring-in leg. If there are more than two sessions with speech media before session transfer in the source Access Leg, the SCC AS performs the following:

   If there are no active sessions, the SCC AS performs the following:

   - besides the inactive session already handled in step 4, releases all other remaining inactive sessions;
   - includes the information that the session is inactive in the transfer response sent to the MSC Server;
   - skips following handling of step 5, 6 and 7, directly goes to step 8 in the information flow.

   If there are at least one active session, the SCC AS performs the following:

- if there are two or more active speech sessions, selects the second-most recently active speech session, puts it on hold and releases all remaining active sessions;
- selects the held session that has been most recently made inactive. Any other inactive sessions are released;

  the Session State Information of the selected inactive session is sent to the MSC Server.

6. The S-CSCF forwards the Session State Information to the MSC Server.
7. If the MSC Server receives the Session State Information on more than one active or inactive speech sessions, it initiates Access Transfer towards the SCC AS for the additional session.
8. The Source Access Leg (which is the Access Leg previously established over PS access) is released as specified in clause 6.3.1.6.

NOTE 3: Steps 4 and 8 consist of a sequence of messages, some of which may occur in parallel.

After completion of this procedure, the UE uses procedures as defined in TS 24.008 [24] to perform service control.

6.3.2.1.2 PS – CS Access Transfer: CS to PS - Dual Radio

Figure 6.3.2.1.2-1 PS – CS Access Transfer: CS to PS - Dual Radio, provides an information flow for Access Transfer of an IMS session in the CS to PS direction. The flow requires that the user has an IMS originating or terminating session that uses CS media at the time of initiation of Access Transfer to PS.

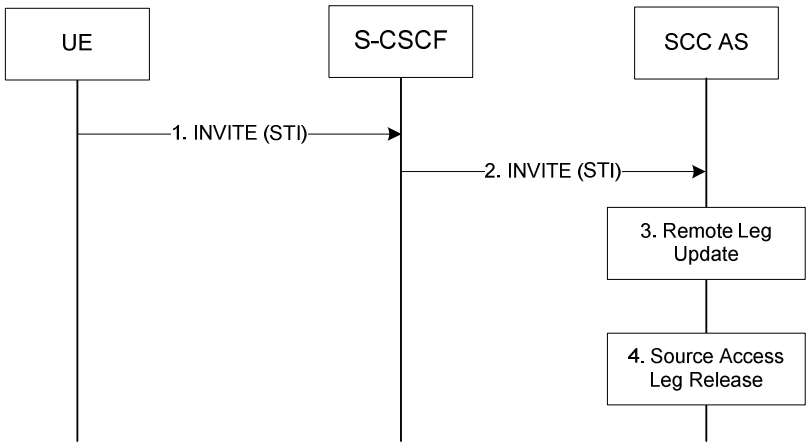

Figure 6.3.2.1.2-1: PS – CS Access Transfer: CS to PS - Dual Radio

1. When the UE determines a need for Access Transfer, the UE initiates registration with IMS (if not already registered in IMS) as specified in clause 6.1. It subsequently initiates an IMS originated session toward the SCC AS using a STI to establish an Access Leg via PS access and requests Access Transfer of the IMS session that is using CS media to PS access. The statically configured STI is used if no dynamically assigned STI has been provided to the UE during session establishment. Please refer to clause 6.2.1 - IMS Originating Sessions for details on IMS origination procedure.
2. Standard procedures are used at S-CSCF for routing of the INVITE to the SCC AS.
3. The SCC AS performs the Access Transfer by updating the Remote Leg with the session information, including session state and connection information, of the newly established Access Leg (see the Remote Leg Update procedure, clause 6.3.1.5). The SCC AS completes the establishment of the Access Leg according to procedures defined in TS 23.228 [4].
4. The source Access Leg which is the Access leg previously established over CS is subsequently released (see clause 6.3.1.6).

NOTE: Steps 3 and 4 consist of a sequence of messages, some of which may occur in parallel.

6.3.2.1.2a PS – CS Access Transfer: CS to PS – Dual Radio with Session State Information

Figure 6.3.2.1.2a-1 PS – CS Access Transfer: CS to PS – Dual Radio with Session State Information, provides an example flow for dual radio CS to PS Access Transfer with Held and Active sessions.

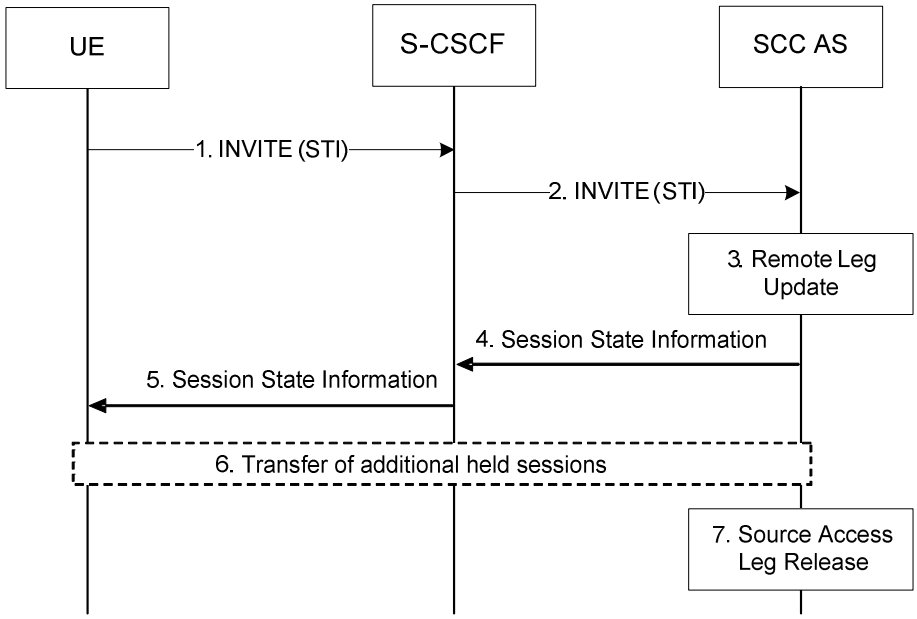

Figure 6.3.2.1.2a-1: CS to PS Access Transfer - Dual Radio with Session State Information

1. When the UE determines a need for Access Transfer, the UE initiates registration with IMS (if not already registered in IMS) as specified in TS 23.228 [4]. It subsequently initiates an IMS originated session towards the SCC AS using a static STI to establish an Access Leg via PS access and requests Access Transfer of the active session to PS access.

2. Standard procedures are used at the S CSCF for routing of the INVITE to the SCC AS.

NOTE 1: The UE has indicated its capability to support MSC Server assisted mid-call feature during Access Transfer in the registration.

3. The SCC AS performs the Access Transfer by updating the Remote Leg with connection information of the newly established Access Leg (see the Remote Leg Update procedure, described in clause 6.3.1.5). The SCC AS completes the establishment of the Access Leg according to procedures defined in TS 23.228 [4].

4. The SCC AS provides Session State Information when both an active session and an inactive session are transferred. The Session State Information includes the additional held session with speech or speech and video media including dynamic STI needed for the held session on the transferring-in leg.

5. The S-CSCF forwards the Session State Information to the UE.

6. If the UE receives the Session State Information of the held session, it initiates a Access Transfer request towards the SCC AS using the dynamic STI for the held session.

7. The Source Access Leg, which is the Access Leg previously established over CS access, is released as specified in clause 6.3.1.6.

NOTE 2: Steps 3 and 7 consist of a sequence of messages, some of which may occur in parallel.

6.3.2.1.3 Subsequent Access Transfers

Procedures for subsequent Access Transfers to CS and PS access are the same as procedures for initial Access Transfers specified in clause 6.3.2.1.1 for PS to CS access and clause 6.3.2.1.2 for CS to PS access.

6.3.2.1.4 PS – CS Access Transfer: PS to CS – Single Radio

Figure 6.3.2.1.4-1 PS-CS: PS to CS – Single Radio, provides an information flow for Access Transfer of media flow(s) of an IMS session in PS to CS direction for Access Transfers within 3GPP access networks as specified in TS 23.216 [10].

The flow requires that the user is active or inactive in an IMS originating or terminating session; procedures and capabilities specified in TS 23.216 [10], clause 6.2.1 are used for the switching of access networks at the transport layer. It further requires that the MSC Server assisted mid-call feature as described in clause 6.3.2.1.4a is not used.

NOTE 1: See TS 23.216 [10] for initiation of handover of only one voice PS bearer at EPC.

NOTE 2: The UE capable of procedures as specified in TS 23.216 [10] does not need to support session and access transfer procedures as specified in clauses 6.3.2.1.1 and 6.3.2.3 to support PS to CS Access Transfer.

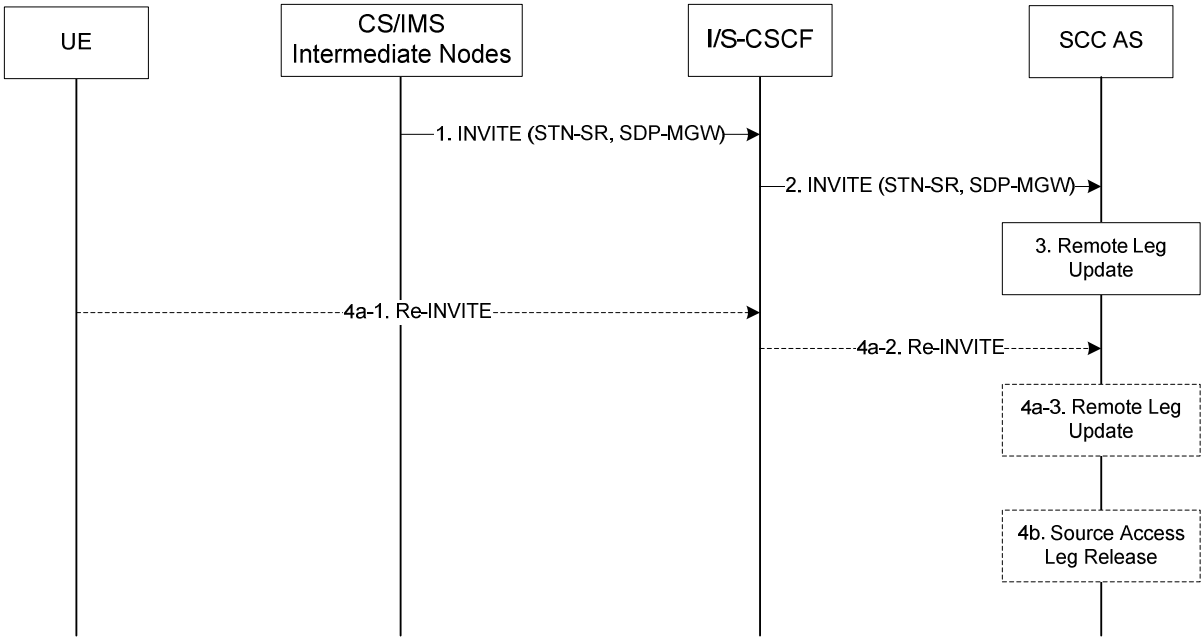

Figure 6.3.2.1.4-1: PS-CS: PS to CS – Single Radio

1. Procedures specified in TS 23.216 [10], clause 6.2.2.1 result in an INVITE to be sent with an STN-SR indicating use of SRVCC procedures for Access Transfer to CS access. The MSC Server enhanced for SRVCC includes the C-MSISDN as calling party number.

2. Standard procedures are used at S-CSCF for routing of the INVITE to the SCC AS.

3. The SCC AS uses the STN-SR to determine that Access Transfer using SRVCC is requested. The SCC AS may retrieve the C-MSISDN from the HSS. The SCC AS is able to identify the correct anchored session. The SCC AS determines if the state of the session to be transferred is active or inactive based on the session state information in the source Access Leg. The SCC AS proceeds with the Access Transfer of the session with bi-directional speech for the UE by updating the Remote Leg with the media description and other information using the Remote Leg Update procedure as specified in clause 6.3.1.5.

NOTE 3: Please refer to clause 4.3.1.2.2 for the behaviour of the SCC AS when the SCC AS finds multiple active sessions with bi-directional speech anchored for the UE.

4a. If the Gm reference point is retained upon PS handover procedure then

4a-1. The UE sends a Re-INVITE via the PS access to update the remaining non-voice media flow(s) associated with the recently added active session. If the UE is using ICS capabilities, this Re-INVITE also adds Gm service control to the active session and the UE subsequently sends Re-INVITEs for any remaining inactive bi-directional speech sessions that are to be transferred.

4a-2. Standard procedures are used at S-CSCF for routing of the Re-INVITE(s) to the SCC AS.

4a-3. The SCC AS processes the Re-INVITE(s) and updates the Remote Leg if needed.

4b. If the Gm reference point is not retained upon PS handover procedure, or if there was no other non-voice media flow(s) in the IMS session than the voice which was transferred to the target access, then the Source Access Leg is released as specified in clause 6.3.1.6.

NOTE 4: Some or all of the steps between steps 3 and 4b may consist of a sequence of messages, some of which may occur in parallel.

If the MSC Server above (located in the box labelled "CS/IMS Intermediate Nodes") is enhanced for ICS as defined in TS 23.292 [5], then it performs IMS registration after the transfer of the session is completed successfully i.e. after step 3. Registration is performed only if the ICS flag is received via the Sv reference point as specified in TS 23.216 [10] or as determined to by the procedure specified in clause 7.2.1.1 in TS 23.292 [5].

6.3.2.1.4a PS – CS Access Transfer: PS to CS – Single Radio with Session State Information

Figure 6.3.2.1.4a-1 PS-CS: PS to CS – Single Radio with Session State Information, provides an information flow for Access Transfer of media of an IMS session in PS to CS direction for Access Transfers within 3GPP access networks as specified in TS 23.216 [10].

The flow requires that the user has an active IMS originating or terminating session, together with at least one more IMS originating or terminating session (active and/or inactive), and that the use of network capabilities to support MSC Server assisted mid-call feature during Access Transfer is possible; procedures and capabilities specified in TS 23.216 [10], clause 6.2.1 are used for the switching of access networks at the transport layer. It further requires that the MSC Server is enhanced to support I2 reference point.

The flow is not applicable in case ICS UE capabilities can be used.

NOTE 1: See TS 23.216 [10] for initiation of hand-over of only one voice PS bearer in EPC.

NOTE 2: The UE capable of procedures as specified in TS 23.216 [10] does not need to support session and access transfer procedures as specified in clauses 6.3.2.1.1 and 6.3.2.3 to support PS to CS Access Transfer.

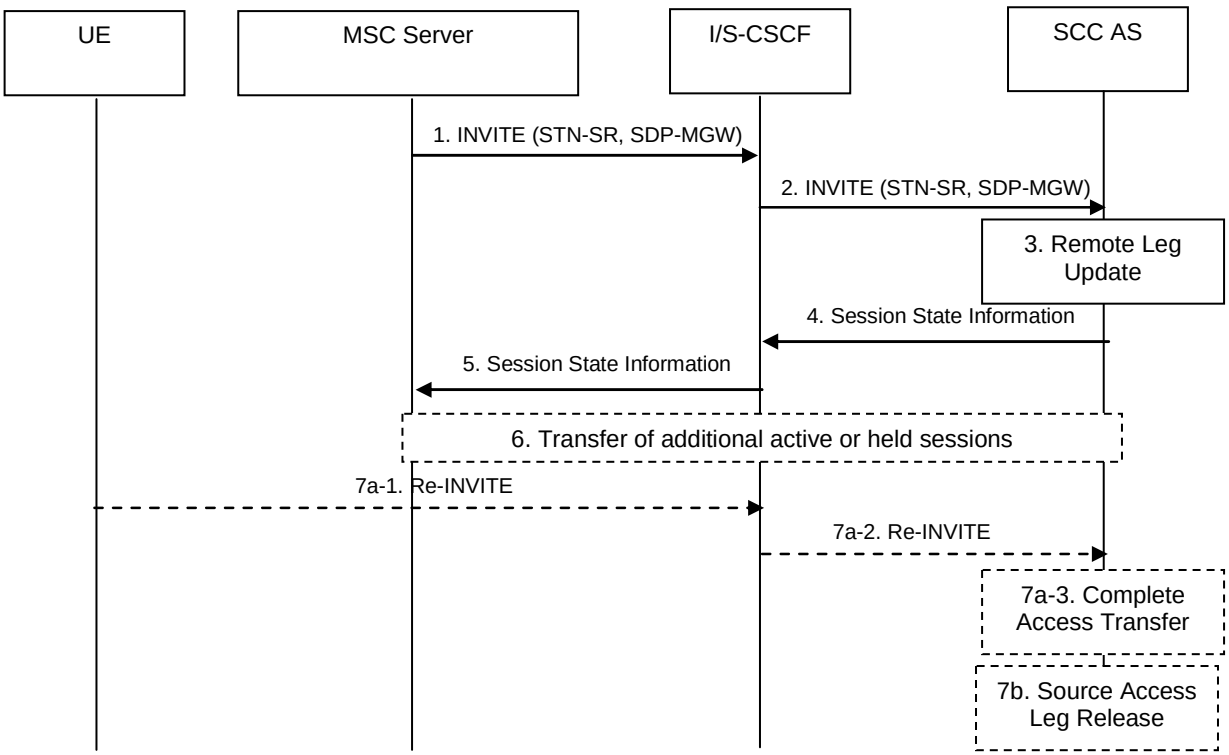

Figure 6.3.2.1.4a-1: PS-CS: PS to CS – Single Radio with Session State Information

1. Procedures specified in TS 23.216 [10], clause 6.2.2.1, result in an INVITE to be sent with an STN-SR indicating use of Single Radio VCC procedures for Access Transfer to CS access. If the user is not IMS

registered by the MSC Server, the MSC Server enhanced for SRVCC includes the C-MSISDN as calling party number. If the user is registered in the IMS by the MSC Server, then the MSC Server includes the GRUU into the Access Transfer request. The MSC Server indicates its capability to support MSC Server assisted mid-call feature during Access Transfer.

2. Standard procedures are used at S-CSCF for routing of the INVITE to the SCC AS.

3. The SCC AS uses the STN-SR to determine that Access Transfer using Single Radio VCC is requested. The SCC AS may retrieve the C-MSISDN from the HSS. The SCC AS identifies the correct anchored session and proceeds with the Access Transfer of the recently added active session or, if there is no active session, the inactive session which was active most recently, with bi-directional speech for the UE by updating the Remote Leg with the media description and other information using the Remote Leg Update procedure as specified in clause 6.3.1.5.

4. The SCC AS provides Session State Information on the transferring-in leg. If there are more than two sessions with speech media before session transfer in the source Access Leg, the SCC AS performs the following:

   If there are no active sessions, the SCC AS performs the following:

   - includes the information that the session is inactive in the transfer response sent to the MSC Server;
   - besides the inactive session already handled in step 3, releases all other remaining inactive sessions;
   - skips following handling of step 4, 5 and 6 in the information flow.

   If there are at least one active session, the SCC AS performs the following:

   - if there are two or more active sessions, selects the second-most recently active speech session, puts it on hold and releases all remaining active sessions;
   - selects the held session that has been most recently made inactive. Any other inactive sessions are released;
   - the Session State Information of the selected inactive session is sent to the MSC Server.

5. The S-CSCF forwards the Session State Information to the MSC Server.

6. If the MSC Server receives the Session State Information of more than one active or inactive speech sessions, it initiates Access Transfer towards SCC AS for the additional session.

NOTE 3: The SCC AS uses the C-MSISDN or GRUU to correlate the Access Transfer request, and additionally the Session State Information to select the correct session.

7a. If the Gm reference point is retained after PS handover procedure completion for non-voice media flows, then:

   7a-1. The UE sends a Re-INVITE via the PS access to update the remaining non-voice media flow associated with the recently added active session.

   7a-2. Standard procedures are used at S-CSCF for routing of the INVITE to the SCC AS.

   7a-3. The SCC AS processes the Re-INVITE and updates the Remote Leg if needed.

7b. If the Gm reference point is not retained after PS handover procedure completion, or if there was no other non-voice media in the IMS session than the voice that was transferred to the target access, then the Source Access Leg is released as specified in clause 6.3.1.6.

NOTE 4: Some or all of the steps between steps 3 and 4b consist of a sequence of messages, some of which may occur in parallel.

If the UE is not IMS registered by the MSC Server enhanced for ICS, the MSC Server performs IMS registration after the transfer of all sessions is completed successfully i.e. after step 6. Registration is performed only if the ICS flag is received via the Sv reference point as specified in TS 23.216 [10] or as determined to by the procedure specified in clause 7.2.1.1 in TS 23.292 [5].

After completion of this procedure, the UE uses procedures as defined in TS 24.008 [24] to perform service control.

6.3.2.1.4b PS to CS Access Transfer: PS to CS – Single Radio; using I1 reference point

Figure 6.3.2.1.4b PS-CS: PS to CS – Single Radio; using I1 reference point, provides an information flow for Access Transfer of media flow(s) of an IMS session in the PS to CS direction for Access Transfers within 3GPP access networks as specified in TS 23.216 [10], and with the use of I1 reference point for service control post transfer to CS.

The flow requires that the UE has indicated ICS capabilities and that the user is active in an IMS originating or terminating session; procedures specified in TS 23.216 [10], clause 6.2.1 are used for the switching of access networks at the transport layer. The I1 reference point of ICS is used for control of IMS sessions established using CS media and a dynamically assigned STI is associated with each session.

NOTE 1: See TS 23.216 [10] for initiation of handover of only one voice PS bearer at EPC.

NOTE 2: The UE capable of procedures as specified in TS 23.216 [10] does not need to support session and access transfer procedures as specified in clauses 6.3.2.1.1 and 6.3.2.3 to support PS to CS Access Transfer.

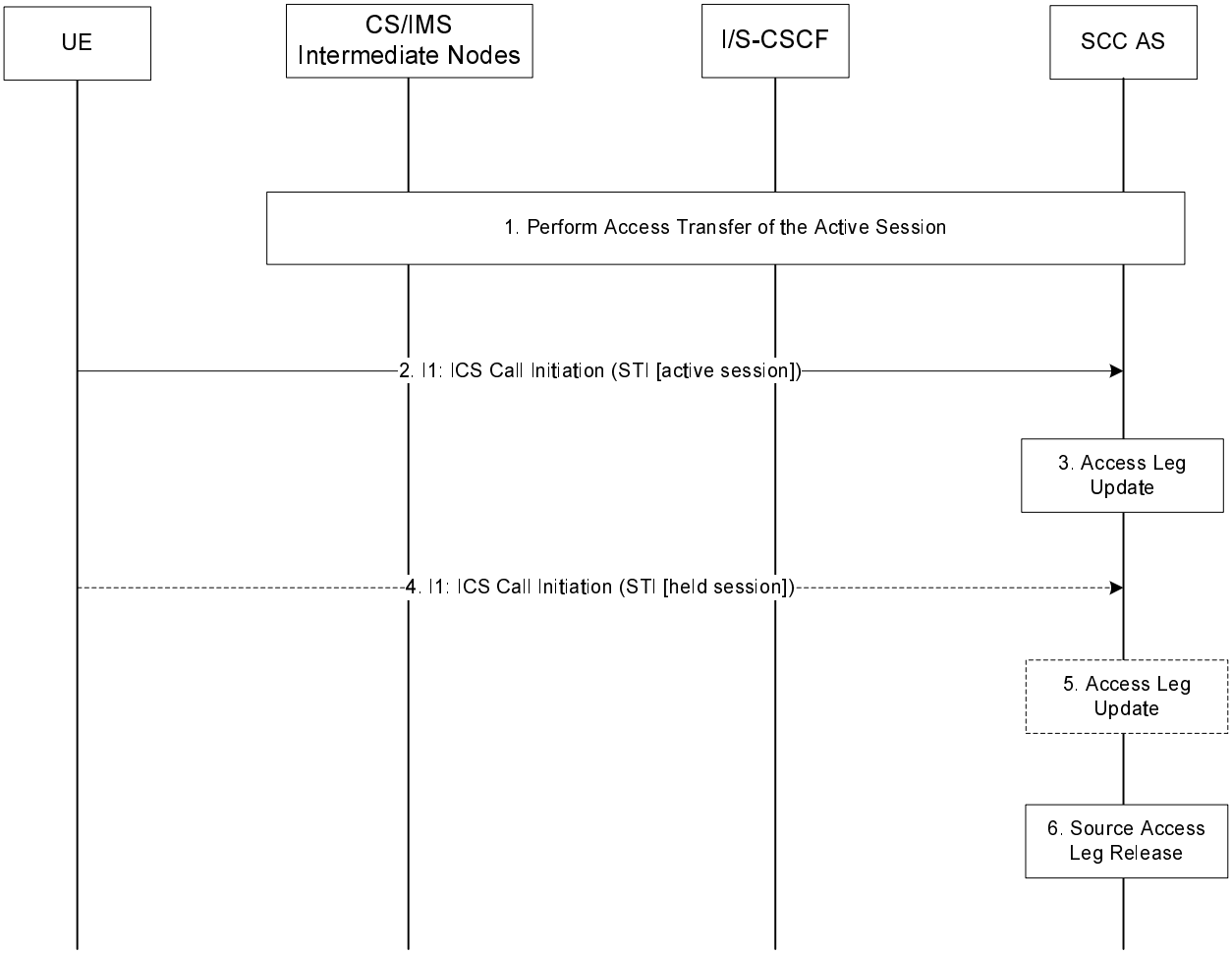

Figure 6.3.2.1.4b-1: PS-CS: PS to CS – Single Radio; using I1 reference point

1. Access Transfer of the active session with bi-directional speech is performed as defined in clause 6.3.2.1.4, steps 1-3.

2. The UE sends an I1: ICS Call Initiation via the CS access as specified in TS 23.292 [5] including an STI for continuation of establishment of the Access Leg using Single Radio VCC for the active session.

3. The SCC AS uses the STI to correlate the Access Transfer request received via the PS access with the Access Transfer request for the active session received via the CS access.

4. If there are any held sessions present at the time of Access Transfer, the UE proceeds with the Access Transfer of the first held session by sending an I1: ICS Call Initiation via the CS access (as described in TS 23.292 [5]) including an STI that identifies the held session.

5. The SCC AS uses the STI to identify the held session and updates the session information on the Access Leg.

NOTE 3: CS media is not established for the held session. The media established upon the transfer of the currently active session is reused for the held session when it is resumed.

Steps 4 and 5 are repeated for the remaining held sessions.

6. The Source Access Leg is released as specified in clause 6.3.1.6.

6.3.2.1.5 PS – CS Access Transfer for voice and video

Figure 6.3.2.1.5-1 describes the information flows for transferring voice and video from PS to CS access.

In this flow, the SCC AS waits for the H245 negotiation completion before updating Remote Leg.

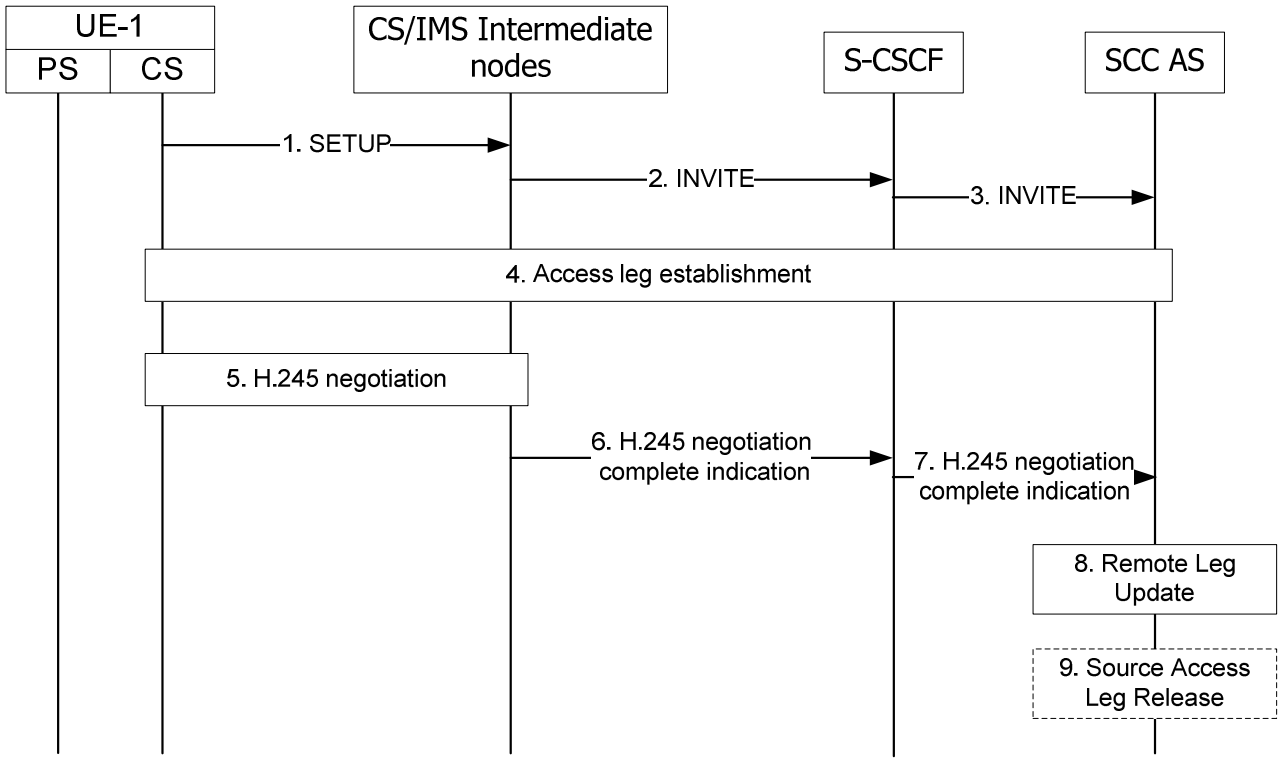

Figure 6.3.2.1.5-1: Information flow for voice and video transfer from PS to CS

1-3. UE-1 starts Access Transfer of multimedia session from PS to CS as specified in steps 1-3 of clause 6.3.2.1.1. The media types of voice and video, included in the INVITE message with STN in step 3, instruct the SCC AS to wait for H.245 negotiation complete to perform the Remote Leg update in step 8.

4. The SCC AS completes the CS leg establishment with UE-1.

5. UE-1 and CS/IMS intermediate node starts in band H.245 negotiation.

6-7. After the H.245 negotiation is done, CS/IMS intermediate node sends H.245 negotiation completion indication towards SCC AS.

8. On receipt of the H.245 negotiation complete indication, the SCC AS updates the Remote Leg as specified in step 4 of clause 6.3.2.1.1

9. The SCC AS may release the Source Access Leg as specified in step 5 of clause 6.3.2.1.1.

NOTE 1: If the non voice and video media flow is retained, the Source Access Leg may be updated by session re-negotiation.

NOTE 2: When using the MSC server enhanced for ICS, the H.245 negotiation with UE-1 shall be executed by the MSC server enhanced for ICS, and the H.245 negotiation complete indication shall be sent by the MSC server enhanced for ICS towards SCC AS.

6.3.2.1.6 PS – CS Access Transfer: PS to CS – Dual Radio, mid-call service with an active speech and video session

Figure 6.3.2.1.6-1 PS to CS with one active speech and video session, using SCUDIF, provides an information flow for Access Transfer of multiple IMS sessions in PS to CS direction. The flow requires that the user is active in an IMS originating or terminating speech and video session using PS media at the time of initiation of Access Transfer to CS and that the use of network capabilities to support mid-call services during session transfer is possible. It further requires that the MSC Server supports I2 reference point. It also requires that SCUDIF feature is supported by the UE and the CS network.

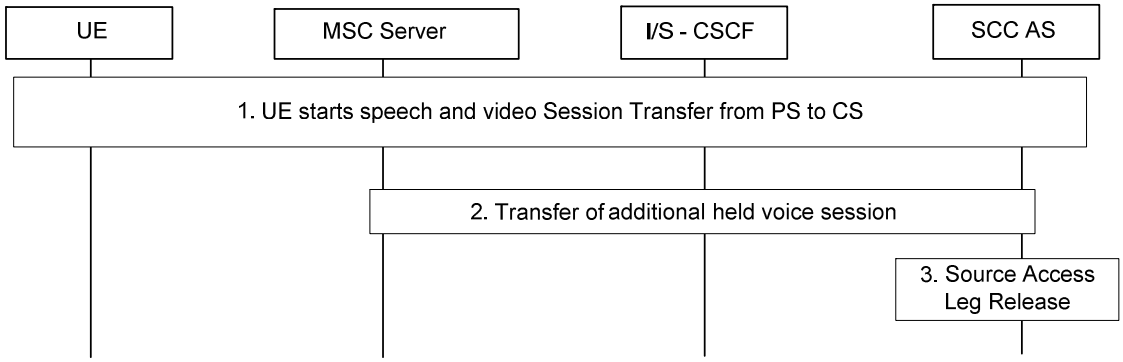

Figure 6.3.2.1.6-1: PS to CS with one active speech and video session, using SCUDIF

1. Standard procedure as specified in clause 6.3.2.1.5 PS – CS Access Transfer for voice and video is used for transferring the active speech and video session. The UE indicates SCUDIF support and provides two bearer capabilities (voice and multimedia) with multimedia preferred when initiating the transfer. Also, the SCC AS provides session state information on the inactive voice session including needed STI on the transferring-in leg to the MSC Server.

2. The MSC Server enhanced for ICS initiates session transfer towards SCC AS for the additional inactive voice session on behalf the UE.

3. The Source Access Leg associated with the inactive voice session is released as specified in clause 6.3.1.6.

Subsequently, the UE can switch between the speech and video session and the voice session with different bearer capabilities activated using SCUDIF feature as specified in TS 23.292 [5].

If SCUDIF is not supported, the transfer can be performed as Figure 6.3.2.1.6-1 with the differences that in step 1 the UE initiates Access Transfer not using SCUDIF, and after the transfer video channel is closed via H.245 negotiation if the voice session is to be activated.

6.3.2.1.7 PS – CS Access Transfer: PS to CS – Dual Radio, mid-call service with one inactive speech and video session

Figure 6.3.2.1.7-1 PS to CS with one inactive speech and video session, using SCUDIF, provides an information flow for Access Transfer of multiple IMS sessions in PS to CS direction. The flow requires that the user is inactive in an IMS originating or terminating speech and video session using PS media at the time of initiation of Access Transfer to CS and that the use of network capabilities to support mid-call services during session transfer is possible. It further requires that the MSC Server supports I2 reference point. It also requires that SCUDIF feature is supported by the UE and the CS network.

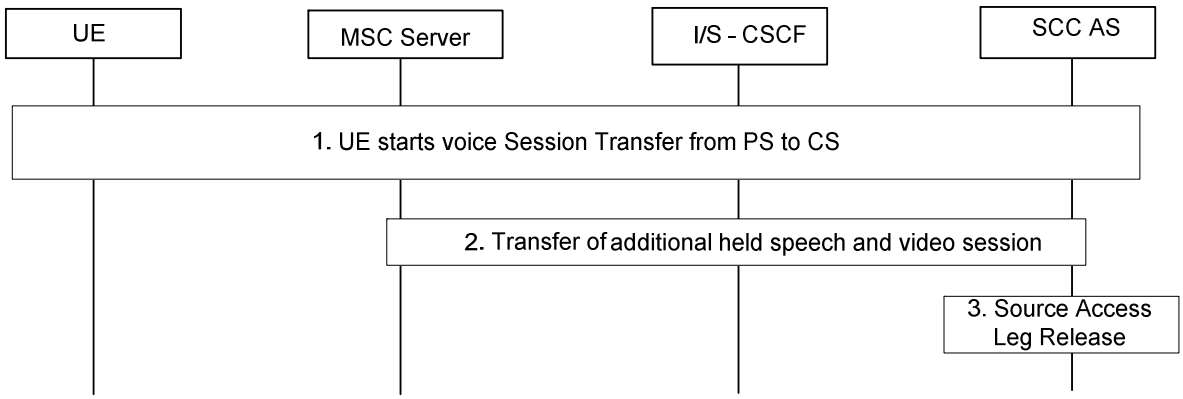

Figure 6.3.2.1.7-1: PS to CS with one inactive speech and video session, using SCUDIF

1. Standard procedure as specified in clause 6.3.2.1.1 PS – CS Access Transfer: PS to CS is used for transferring the active voice session. The UE indicates SCUDIF support and provides two bearer capabilities (voice and multimedia) with voice preferred when initiating the transfer. Also, the SCC AS provides session state information on the inactive speech and video session including needed STI on the transferring-in leg to the MSC Server.

2. The MSC Server enhanced for ICS initiates session transfer towards SCC AS for the additional inactive speech and video session on behalf the UE.

3. The Source Access Leg associated with the inactive speech and video session is released as specified in clause 6.3.1.6.

Subsequently, the UE can switch between the speech and video session and the voice session with different bearer capabilities activated using SCUDIF feature as specified in TS 23.292 [5].

If SCUDIF is not supported, the transfer can be performed as Figure 6.3.2.1.7-1 with the differences that in step 1 the UE initiates Access Transfer not using SCUDIF, and after the transfer redial mechanism can be used to switch between the speech and video call and the voice call as specified in TS 23.292 [5].

6.3.2.1.8 PS - CS Access Transfer: Conferencing - for UEs not using ICS capabilities

When the UE is using a conference service and Access Transfer between PS and CS access networks happens, the conference information should be provided by the SCC AS.

When the UE in an on-going conference performs Access Transfer from PS to CS, the SCC AS shall provide the conference information (i.e. conference URI, identifier of all participants, etc.) to the MSC Server enhanced for ICS as specified in TS 23.292 [5] or the MSC Server enhanced for SRVCC as specified in TS 23.216 [10] on the Target Access Leg. When the MSC Server receives the conference information, it shall create a conference state in CS access network (i.e. call in MPTY). When multiple multi-media sessions including a conference exist, if the active session being transferred or the selected additional session to be transferred is a conference call, the conference information shall also be included in the session state information to be sent by the SCC AS to the MSC Server. The MSC Server using the conference information then performs conference control on behalf of the UE as specified in TS 23.292 [5].

When the UE in an on-going conference performs Access Transfer from CS to PS, the SCC AS shall provide the conference information (i.e. conference URI, etc.) to the UE on the Target Access Leg. When multiple sessions including a conference exist, if the active session being transferred or the additional held session is a conference call, the conference information shall also be included in the Session State Information to be sent by the SCC AS to the UE. The UE then uses the conference information to control the conference in PS domain as specified in TS 24.147 [25].

6.3.2.2 PS – PS Access Transfer

NOTE: If a PS-PS session transfer occurs and there is a change in IP address, TCP-based media flow(s) using transferring-out access will break. Recovery procedures from broken TCP connections are application specific.

6.3.2.2.1 PS-PS Access Transfer with full media transfer

UE-1 is attached to one IP-CAN and it registers to the S-CSCF. UE-1 establishes an active multimedia session with UE-2 via this IP-CAN. After changing to a new IP-CAN, obtaining new signalling and media addresses, and completing the Access Transfer procedures, UE-1 continues the multimedia session with UE-2 via the new IP-CAN.

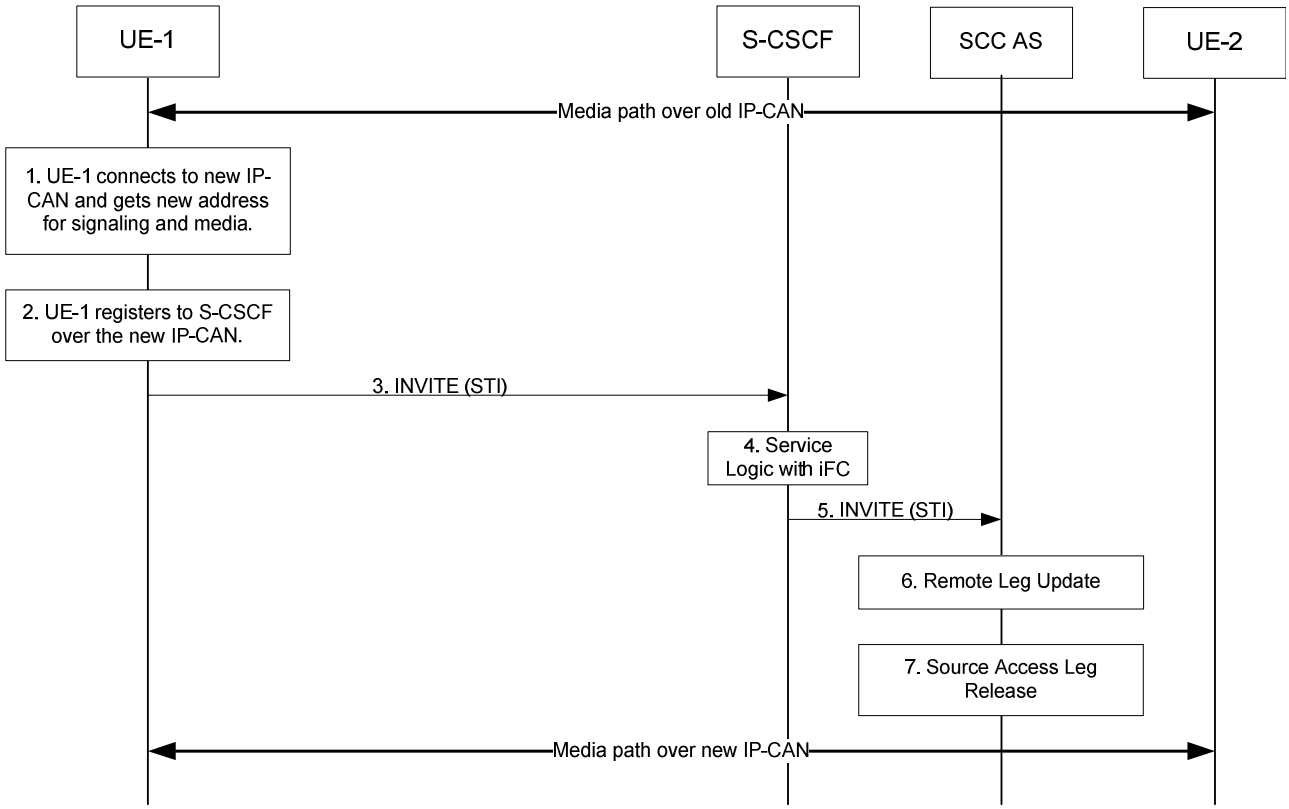

Figure 6.3.2.2.1-1: Information flow for PS-PS Access Transfer

1. UE-1 connects to a new IP-CAN and receives new IP address(es). UE-1 decides to perform PS to PS Access Transfer based on SC policy information.

2. UE-1 registers to the S-CSCF via the new IP-CAN. This registration may go through the same P-CSCF or a different P-CSCF.

3 ~ 5. UE-1 sends an INVITE message on the new IP-CAN towards the SCC AS. The INVITE message includes the STI identifying the session to be transferred. The INVITE message also indicates to the SCC AS that it performs Access Transfer with full media transfer.

6. The SCC AS identifies the session based on STI and updates the session over the remote access leg (see clause 6.3.1.5).

7. The SCC AS completes session setup with UE-1 on the new access leg and releases old session based on the standard IMS procedures.

6.3.2.2.2 PS-PS Access Transfer with partial media transfer

UE-1 is on an active multimedia session with UE-2 via one IP-CAN. After changing to a new IP-CAN and obtaining new signalling and media addresses, UE-1 transfers part of the multimedia session with UE-2 to the new IP-CAN and keeps the remaining part on the original IP-CAN. UE-1 is attached to both the new and old IP-CANs after the Access Transfer procedures. The call flow is the same as shown in clause 6.3.2.2.1. The only difference is that in Step 3, the INVITE needs to indicate that the request is for a partial transfer and instead of releasing the old session in step 7, the UE updates session information over the old access leg. In this case, the INVITE message sent in step 3 shall indicate the media flow(s) which need to be transferred to the new IP-CAN.

6.3.2.3 PS - PS in conjunction with PS - CS Access Transfer

6.3.2.3.1 PS - PS in conjunction with PS - CS Access Transfer: PS to CS for UEs not using ICS capabilities

It is required that the UE has a single ongoing IMS session containing speech or speech and video and other media with the remote end. After the Access Transfer, the two sessions are treated as independent sessions on the transferring-in Access Legs for mid-call service (e.g. hold of PS or CS media).

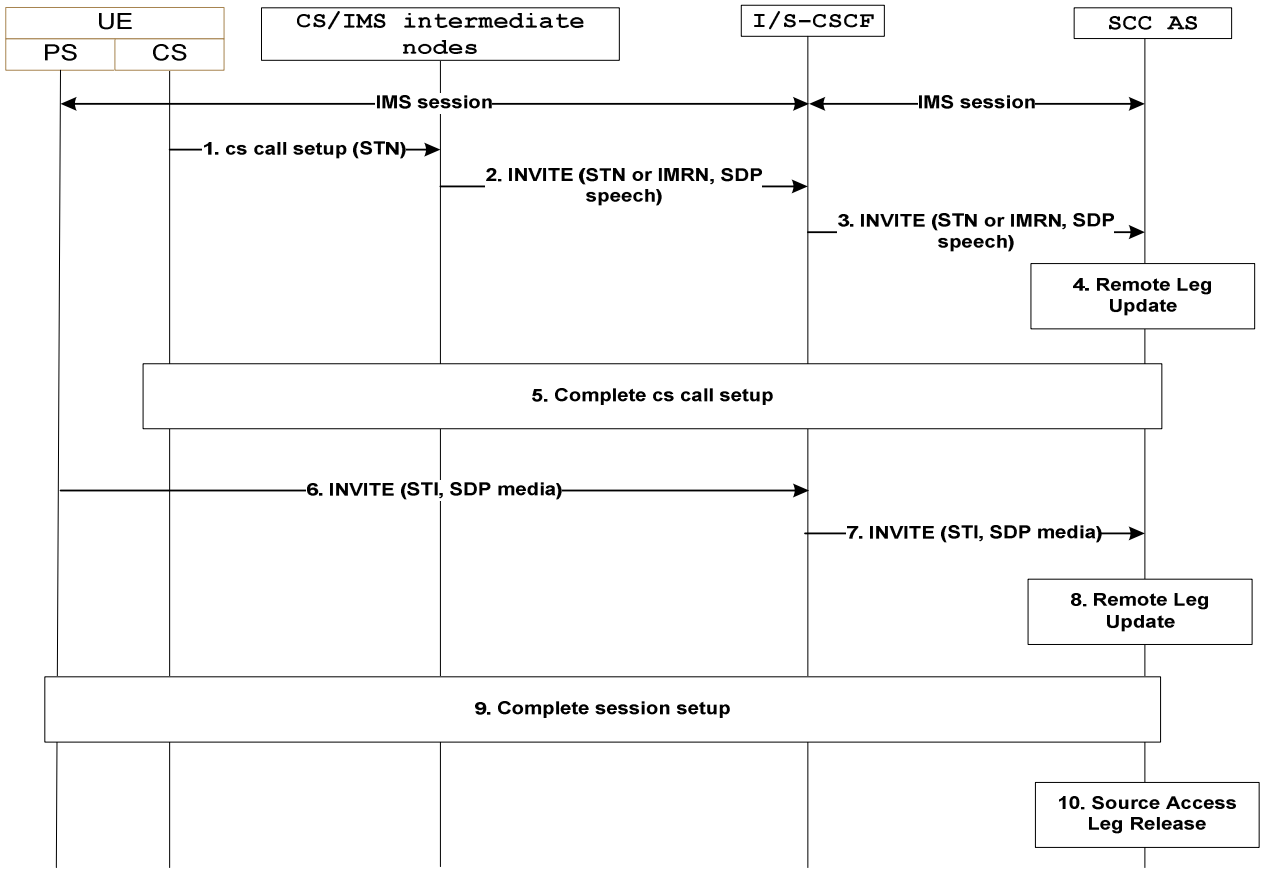

Figure 6.3.2.3.1-1: PS-PS in conjunction with PS-CS Access Transfer: PS to CS

1. When the UE determines a need for Access Transfer, the UE attaches to CS (if not already attached). It subsequently initiates the PS–CS Access Transfer by sending a CS call setup including the STN to establish the Access Leg via the CS access. A static STN preconfigured to the UE is used.
2. An INVITE is routed to the S-CSCF.
3. An INVITE is routed to the SCC AS.
4. The SCC AS performs the Remote Leg update by using procedures defined in clause 6.3.1.5. The SCC AS updates the speech or speech and video media being transferred in the session towards the Remote Leg.
5. The SCC AS completes the session setup towards UE according to procedures defined in TS 23.228 [4].
6. The UE initiates registration with IMS via the new PS access (if not already registered) as specified in clause 6.1. It subsequently initiates the PS–PS Access Transfer by sending an INVITE including the SDP for the non-real-time media flow(s) and STI to establish the Access Leg via the PS access. A dynamic STI allocated at the time of IMS session creation is used.
7. An INVITE is routed to the SCC AS.

8. The SCC AS identifies the session to be transferred using the STI. The SCC AS performs the Remote Leg update by using procedures defined in clause 6.3.1.5. The SCC AS updates the non-real-time media flow(s) in the session towards the Remote Leg.

9. The SCC AS completes the session setup towards UE according to procedures defined in TS 23.228 [4].

10. Source Access Leg Release is performed according to the procedures defined in clause 6.3.1.6.

NOTE: Steps 1-5 can be performed in reversed order with steps 6-8.

6.3.2.3.2 PS - PS in conjunction with PS - CS Access Transfer: CS to PS for UEs not using ICS capabilities

It is required that the UE has an ongoing CS call and a related IMS session with the remote end.

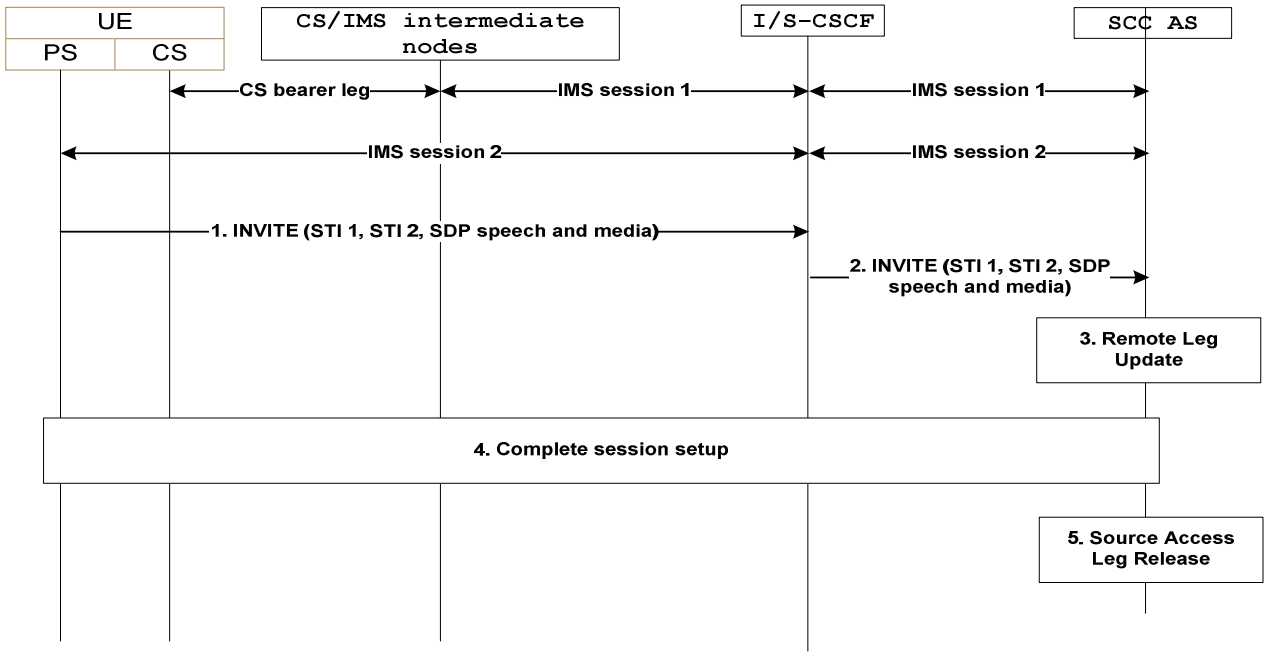

Figure 6.3.2.3.2-1: PS-PS in conjunction with PS-CS Access transfer: CS to PS

1. When the UE determines a need for Access Transfer, the UE initiates registration with IMS via the new PS access (if not already registered) as specified in clause 6.1. It subsequently initiates the Access Transfer by sending an INVITE to establish the Access Leg via the PS access. The INVITE includes the SDP for speech or speech and video and non-real-time media flow(s) and STI-1 and STI-2 respectively for the IMS session using CS and the IMS session using PS to be transferred. For STI-1 a static STI preconfigured to the UE is used. For STI-2 a dynamic STI allocated at the time of IMS session creation is used. STI-1 and STI-2 are never the same.

2. Standard procedures are used at S-CSCF for routing of the INVITE to the SCC AS.

3. The SCC AS identifies the session to be transferred using the STI-1 and STI-2. The SCC AS performs the Remote Leg Update by using procedures defined in clause 6.3.1.5. The SCC AS updates the combined session towards the Remote Leg.

4. The SCC AS completes the session setup towards UE-1 according to procedures defined in TS 23.228 [4].

5. Source Access Leg Release is performed according to the procedures defined in clause 6.3.1.6.

6.3.2.3.3 PS – PS in conjunction with PS - CS Access Transfer: PS to CS for UEs with ICS capabilities - Using Gm reference point

Figure 6.3.2.3.3-1 PS-PS in conjunction with PS–CS Access Transfer: PS to CS for UEs with ICS capabilities, provides an information flow for Access Transfer of real time media flow(s) of an IMS session in PS to CS direction and zero or

more non real time media flow(s) in PS to PS direction. The UE may choose to retain some of the non real time media flow(s) in the original PS access.

The flow requires that the user is in an active or inactive IMS originating or terminating session; the Gm reference point of ICS is used for control of IMS sessions that use CS media.

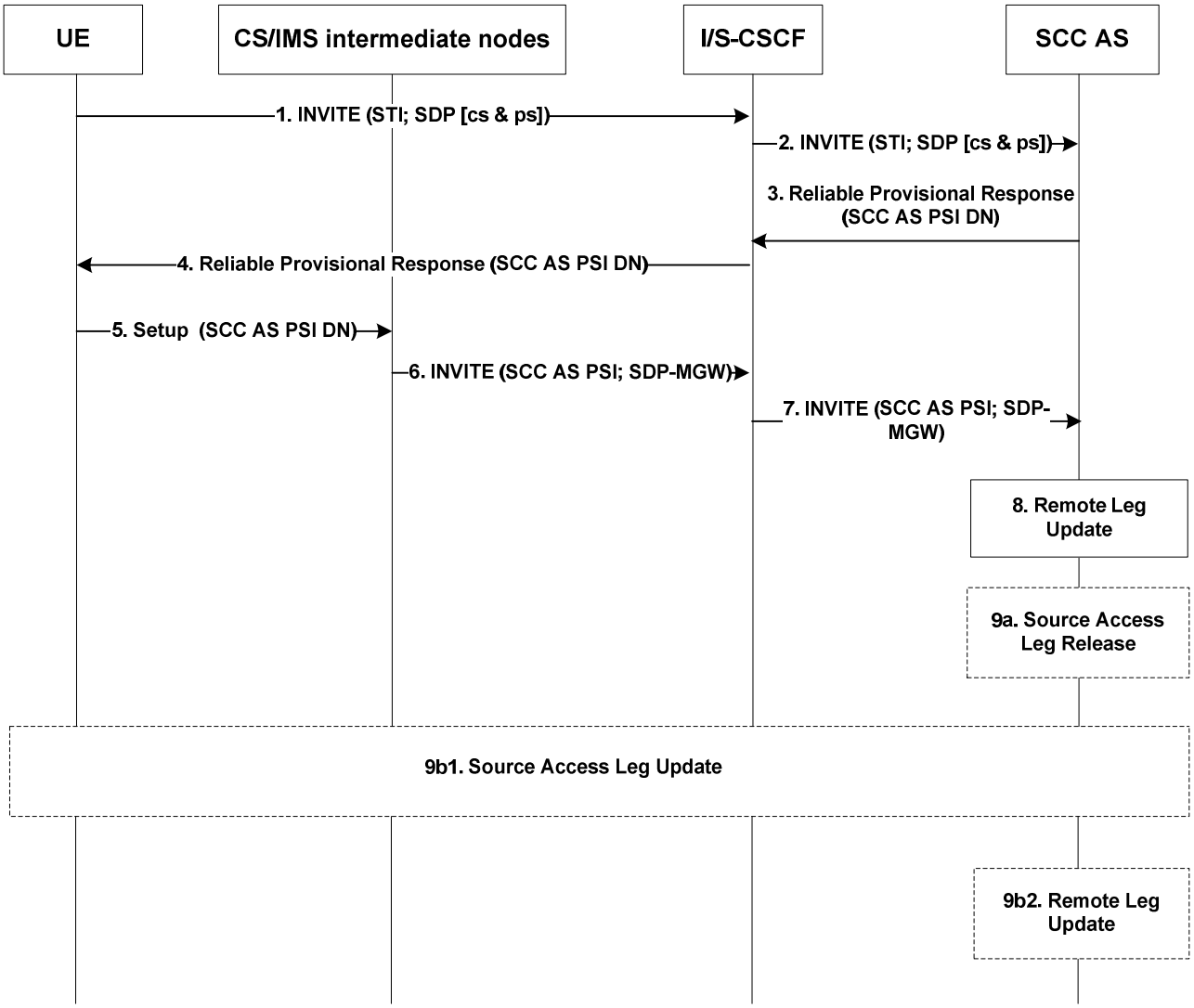

Figure 6.3.2.3.3-1: PS-PS in conjunction with PS-CS Access transfer: PS to CS for UEs with ICS capabilities

1. When the UE determines a need for Access Transfer, the UE initiates registration with IMS via the new PS access (if not already registered) as specified in clause 6.1. It subsequently initiates the "Originations with CS media using the Gm reference point" procedure as specified in TS 23.292 [5], clause 7.3.2.2.4 by sending an INVITE including the STI to establish the Access Leg via the PS access. The INVITE also includes an indication to use a CS bearer for the real time media and a description of non real time media flow(s) that are to be transferred to the new PS access if any non real time media is present at the time of initiation of Access Transfer.

2. Standard procedures are used at S-CSCF for routing of the INVITE to the SCC AS.

3. The SCC AS identifies the session to be transferred using the STI and the media flow(s), and continues the "Originations with CS media using the Gm reference point" procedure for completion of the setup of CS media for the Access Leg by allocating a SCC AS PSI DN and sending it in a reliable provisional response to the S-CSCF (see TS 23.292 [5] for SCC AS PSI DN).

4. The S-CSCF forwards the provisional response (containing the SCC AS PSI DN) to the UE.

5. The UE continues the "Originations with CS media using the Gm reference point" procedure by sending a Setup message including the SCC AS PSI DN to establish the CS media for the Access Leg.

6. The "Originations with CS media using Gm reference point procedure" is used at the CS and IMS intermediate nodes, resulting in routing of an INVITE to the I/S-CSCF.

7. The I/S-CSCF extends the INVITE with the SCC AS PSI and SDP of the MGW as part of the "Originations with CS media using the Gm reference point" procedure.

8. The SCC AS uses the SCC AS PSI to correlate the incoming session via the CS access with the Access Transfer request previously received via the PS access.

   The SCC AS completes the establishment of the Access Leg by combining the description of the media established via the CS access with the description of the media flow(s) established via the PS access for the signalling associated with the Access Leg.

   The SCC AS performs the Access Transfer by updating the Remote Leg with the media description and other information of the newly established Access Leg using the Remote Leg Update procedure as specified in clause 6.3.1.5.

9a. If the UE transfers all the non real time media flow(s) to the new PS access, the Source Access Leg (which is the Access Leg previously established over PS access) is released as specified in clause 6.3.1.6.

9b. If the UE chooses to retain some media flow(s) in the original PS access, then:

   9b1. the UE sends an INVITE to the SCC AS (as part of the existing dialog) to update the session information over the Source Access Leg; and

   9b2. the SCC AS performs the Remote Leg update (if necessary) by using procedures defined in clause 6.3.1.5. The Source Access Leg is not released in this case.

NOTE: Steps 8 and 9 consist of a sequence of messages, some of which may occur in parallel.

6.3.2.3.4 PS - PS in conjunction with PS - CS Access Transfer: CS to PS for UEs with ICS capabilities - Using Gm reference point

The information flow for Access Transfer of real time media of an IMS session in CS to PS direction, and zero or more non real time media flow(s) in PS to PS direction is the same as the information flow for PS–CS Access Transfer: CS to PS access, as specified in clause 6.3.2.1.2.

The flow requires that the user is in an active or inactive IMS originating or terminating session; the Gm reference point of ICS is used for control of IMS sessions that use CS media; and a dynamic STI is associated with each session.

6.3.2.3.5 PS – PS in conjunction with PS – CS Access Transfer: Active/Held sessions - Using Gm reference point

Figure 6.3.2.3.5-1 PS–PS in conjunction with PS–CS Access Transfer: Active/Held sessions, provides an information flow for Access Transfer of real time media flow(s) of one active and one or more held sessions between PS and CS, any of which may have zero or more non real time media flow(s) which is transferred within the PS access.

The flow requires that the user is in an active IMS originating and/or terminating sessions; the Gm reference point of ICS is used for control of IMS sessions that use CS media; and a dynamic STI is associated with each session.

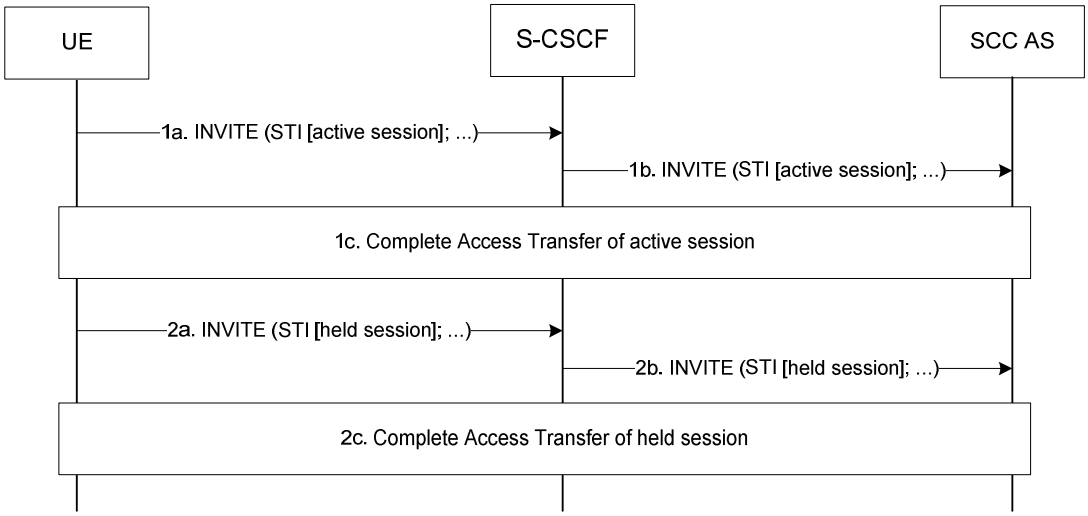

Figure 6.3.2.3.5-1: PS-PS in conjunction with PS-CS Access transfer: Active/Held sessions

1a, 1b. When the UE determines a need for Access Transfer, the UE initiates the Access Transfer of the active session as specified in clause 6.3.2.3.3 PS–PS in conjunction with PS–CS Access Transfer: PS to CS for UEs with ICS capabilities, or clause 6.3.2.3.4 PS–PS in conjunction with PS-CS Access Transfer: CS to PS for UEs with ICS capabilities, based on the direction of the Access Transfer of the real time media. The STI of the active session is used by SCC AS to identify the active session.

1c. The UE and the SCC AS complete the Access Transfer of the active session.

2a, 2b. The UE initiates the Access Transfer of the first held session using the same procedures as identified in steps 1a and 1b with a difference that for transfer to CS access, the CS media is not established for the held session; the media established upon the transfer of the currently active session is reused for the held session when it is resumed. The STI of the held session is used by SCC AS to identify the held session.

2c. The UE and the SCC AS complete the Access Transfer of the held session.

Steps 2a, 2b and 2c are repeated for the remaining held sessions.

NOTE 1: Steps 1c and 2c consist of a sequence of messages, which may occur in parallel.

NOTE 2: Another supported scenario is when there are no active sessions, i.e. the session in 1a and 1b may also be a held session.

6.3.2.3.6 PS – PS in conjunction with PS – CS Access Transfer: Explicit Communication Transfer - Using Gm reference point

Prior to consultative transfer, the transferor UE may have one session with the transferee UE and one session with the transfer target UE. If the transferor UE performs Access Transfer in this case, the information flow for PS–PS in conjunction with PS–CS Access Transfer: Explicit Communication Transfer is the same as the information flow in clause 6.3.2.3.5 PS–PS in conjunction with PS–CS Access Transfer: Active/held sessions.

For all other cases in ECT service, there is only one session at the UE. Depending on the direction of the Access transfer, the following information flows apply:

- the information flow in clause 6.3.2.3.3 for PS-PS in conjunction with PS-CS Access Transfer: PS to CS; or,
- the information flow in clause 6.3.2.3.4 for PS-PS in conjunction with PS-CS Access Transfer: CS to PS.

The flow requires that the user is active in IMS originating and/or terminating sessions with the Explicit Communication Transfer service; the Gm reference point of ICS is used for control of IMS sessions that use CS media; and a dynamic STI is associated with each session.

6.3.2.3.7 PS – PS in conjunction with PS – CS Access Transfer: Conferencing - Using Gm reference point

The information flows for PS–PS in conjunction with PS–CS Access Transfer: Conferencing in PS to CS and CS to PS directions, are the same as the information flows in clause 6.3.2.3.3 PS–PS in conjunction with PS–CS Access Transfer: PS to CS for UEs with ICS capabilities, and clause 6.3.2.3.4 PS–PS in conjunction with PS–CS Access Transfer: CS to PS for UEs with ICS capabilities respectively.

The flow requires that the user is in an active or inactive IMS originating and/or terminating sessions with the Conferencing service; the Gm reference point of ICS is used for control of IMS sessions that use CS media.

6.3.2.3.8 PS – PS in conjunction with PS – CS Access Transfer: PS to CS – using I1 reference point

Figure 6.3.2.3.8-1 PS-CS in conjunction with PS-CS Access Transfer: PS to CS access - using I1 reference point, provides an information flow for Access Transfer of real time media flow(s) of an IMS session in PS to CS direction.

The flow requires that the user is in an active or inactive IMS originating or terminating session; the I1 reference point of ICS is used for control of IMS sessions that use CS media; and a unique STI is associated with each session.

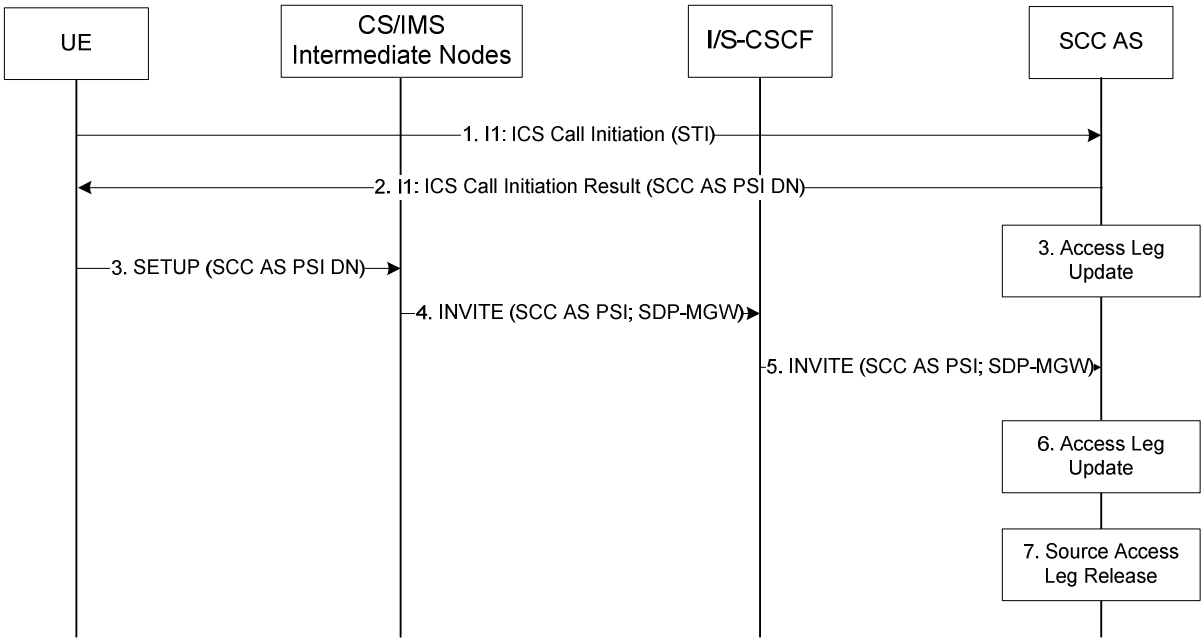

Figure 6.3.2.3.8-1: PS–CS in conjunction with PS–CS Access Transfer: PS to CS access - using I1 reference point

1. When the UE determines a need for Access Transfer, the UE initiates registration with IMS via the new PS access (if not already registered) as specified in clause 6.1. It subsequently initiates the "Originations to a SIP URI" procedure as specified in TS 23.292 [5], clause 7.3.2.2.2.1 by sending an I1, ICS Call Initiation including the STI to establish the Access Leg via the PS access.

2. The SCC AS identifies the session to be transferred using the STI, and continues the "Originations to a SIP URI" procedure for completion of the setup of CS media for the Access Leg by allocating a SCC AS PSI DN and sending it in an I1, ICS Call Initiation Result; see TS 23.292 [5] for SCC AS PSI DN.

3. The UE continues the "Originations to a SIP URI" procedure by sending a Setup message including the SCC AS PSI DN to establish the CS media for the Access Leg.

4. The "Originations to a SIP URI" procedure is used at the CS and IMS intermediate nodes, resulting in routeing of an INVITE with the SCC AS PSI to the I/S-CSCF.

5. The I/S-CSCF forwards the INVITE with the SCC AS PSI and SDP of the MGW as part of the "Originations with CS media using the Gm reference point" procedure.

6. The SCC AS uses the SCC AS PSI to correlate the CS bearer control signalling request received via the CS access with the Access Transfer request previously received via the PS access.

   The SCC AS completes the establishment of the Access Leg by combining the description of the media established via the CS access with the description of the media flow(s) established via the PS access for the signalling associated with the Access Leg.

   The SCC AS performs the Access Transfer by updating the Remote Leg with the media description and other information of the newly established Access Leg using the Remote Leg Update procedure as specified in clause 6.3.5.

7. The Source Access Leg (which is the Access Leg previously established over PS access) is released as specified in clause 6.3.6.

NOTE: Steps 6 and 7 consist of a sequence of messages, some of which may occur in parallel.

6.3.2.3.9 PS - PS in conjunction with PS - CS Access Transfer: CS to PS - using I1 reference point

The information flow for Access Transfer of real time media of an IMS session in CS to PS direction when the I1 reference point is used for service control of sessions that use CS media, is the same as the information flow PS–CS Access Transfer: CS to PS access, as specified in clause 6.3.2.1.2.

The flow requires that the user is in an active or inactive IMS originating or terminating session; the I1 reference point of ICS is used for control of IMS sessions that use CS media; and a unique STI is associated with each session.

6.3.2.3.10 PS - PS in conjunction with PS - CS Access Transfer: PS to CS for Active/Held sessions - using I1 reference point

Figure 6.3.2.3.10-1 PS – PS in conjunction with PS – CS Access Transfer: PS to CS for Active/Held sessions – using I1 reference point, provides an information flow for Access Transfer of real time media of one active and one or more held sessions from PS to CS when the I1 reference point is used for service control of sessions that use CS media.

The flow requires that the user is active in IMS originating and/or terminating sessions; the I1 reference point of ICS is used for control of IMS sessions that use CS media; and a unique STI is associated with each session.

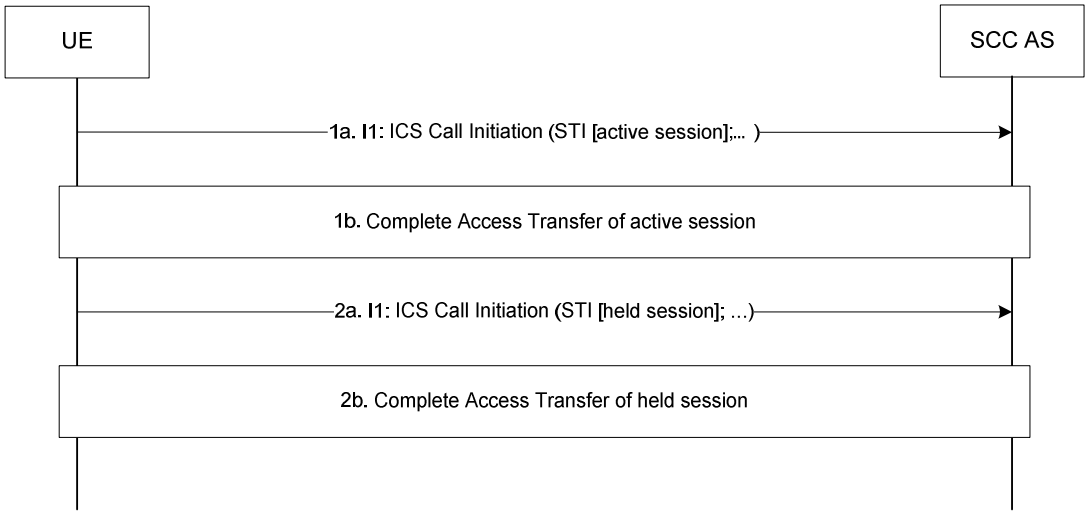

Figure 6.3.2.3.10-1: PS – PS in conjunction with PS – CS Access Transfer: PS to CS for Active/Held sessions – using I1 reference point

1a. When the UE determines a need for Access Transfer, the UE initiates the Access Transfer of the active session as specified in clause 6.3.2.3.8 PS – PS in conjunction with PS – CS Access Transfer: PS to CS – using I1 reference point The STI of the active session is used by SCC AS to identify the active session.

1b. The UE and the SCC AS complete the Access Transfer of the active session.

2a. The UE initiates the Access Transfer of the first held session using the same procedures as identified in steps 1a and 1b with a difference that the CS media is not established for the held session; the media path established upon transfer of the currently active session is reused for the held session when it is resumed. The STI of the held session is used by SCC AS to identify the held session.

2b. The UE and the SCC AS complete the Access Transfer of the held session.

Steps 2a and 2b are repeated for the remaining held sessions.

NOTE 1: Steps 1b and 2b consist of a sequence of messages, which may occur in parallel.

NOTE 2: Another supported scenario is when there are no active sessions, i.e. the session in 1a and 1b may also be a held session.

6.3.2.3.11 PS - PS in conjunction with PS - CS Access Transfer: CS to PS for Active/Held sessions - using I1 reference point

Figure 6.3.2.3.11-1 PS – PS in conjunction with PS – CS Access Transfer: CS to PS for Active/Held sessions – using I1 reference point, provides an information flow for Access Transfer of real time media of one active and one or more held sessions from CS to PS when the I1 reference point is used for service control of sessions that use CS media.

The flow requires that the user is active in IMS originating and/or terminating sessions; the I1 reference point of ICS is used for control of IMS sessions that use CS media; and a unique STI is associated with each session.

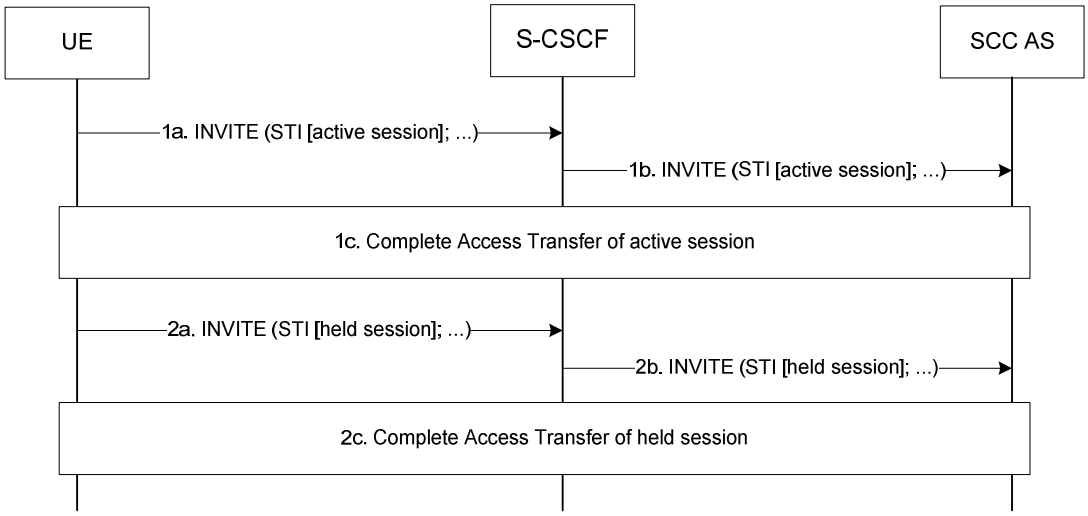

Figure 6.3.2.3.11-1: PS – PS in conjunction with PS – CS Access Transfer: CS to PS for Active/Held sessions - using I1 reference point

1a, 1b. When the UE determines a need for Access Transfer, the UE initiates the Access Transfer of the active session as specified in clause 6.3.2.3.9 PS – PS in conjunction with PS – CS Access Transfer: CS to PS - using I1 reference point. The STI of the active session is used by SCC AS to identify the active session.

1c. The UE and the SCC AS complete the Access Transfer of the active session.

2a, 2b. The UE initiates the Access Transfer of the first held session using the same procedures as identified in steps 1a, 1b and 1c. The STI of the held session is used by SCC AS to identify the held session.

2c. The UE and the SCC AS complete the Access Transfer of the held session.

Steps 2a, 2b and 2c are repeated for the remaining held sessions.

NOTE: Steps 1c and 2c consist of a sequence of messages, which may occur in parallel.

6.3.3 Media Adding/Deleting

6.3.3.1 Local End Initiation case: Adding new PS media to existing CS session

The call flow in figure 6.3.3.1-1 presents a scenario where UE-1 adds PS media flow(s) (e.g. video) to an existing multimedia session that only contains CS media. As a post condition the UE-1 has an ongoing CS call and a related IMS session with the remote end.

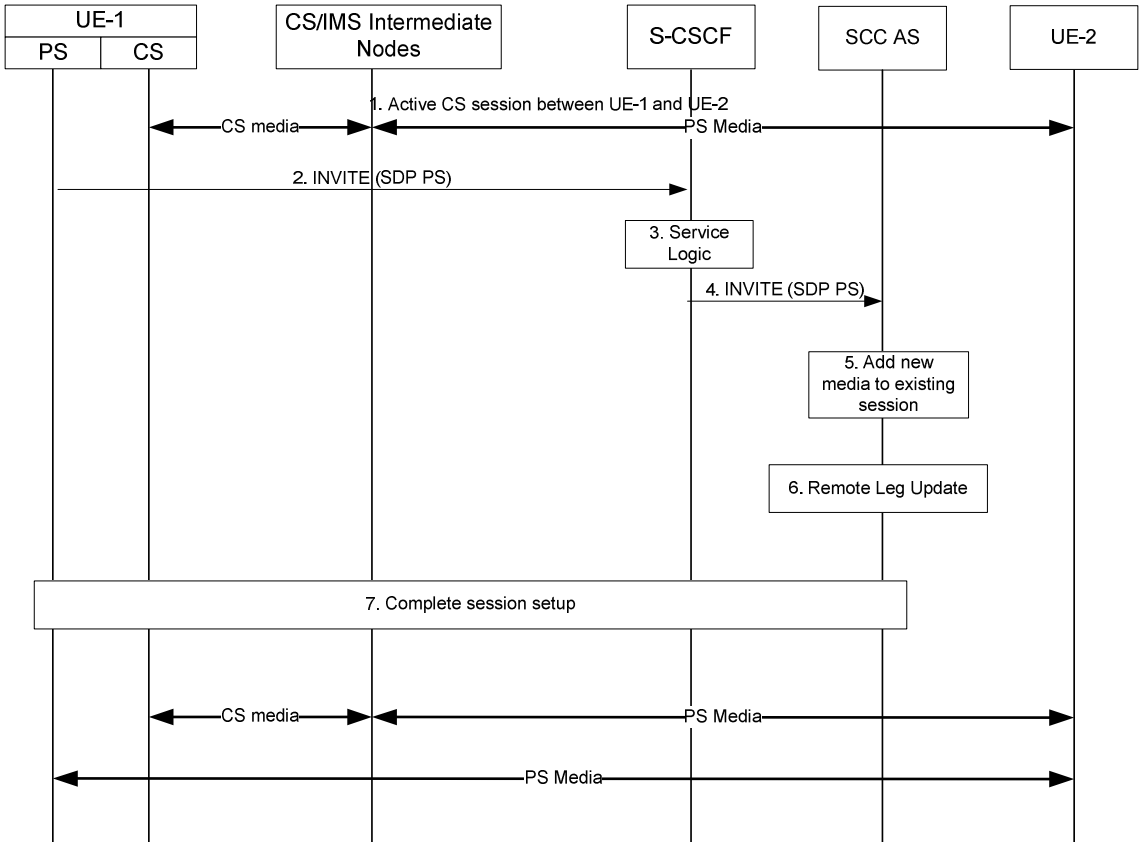

Figure 6.3.3.1-1: Local End Initiation case: Adding new PS media to existing CS session

1. A multimedia session between UE-1 and UE-2 is established as either originated or terminated session with CS media as described in TS 23.292 [5] clauses 7.3.2.1 and 7.4.2.1, respectively i.e. UE-1 is not using the ICS capability and therefore not using the Gm reference point during the session establishment.

2. UE-1 requests to add one or more PS media component(s) to the existing CS Call by sending an INVITE containing description of the new PS media towards SCC AS to establish a new Access Leg. UE-1 provides description of the new media and the information necessary for the SCC AS to identify the existing session.

3. The S-CSCF executes any service logic as appropriate.

4. The S-CSCF sends the INVITE to the SCC AS.

5. The SCC AS determines that the INVITE is related to an existing session using the information provided by UE-1 and decides to add the new media flow to the session.

NOTE: If SCC AS decides that the request is not related to an existing session, it handles the INVITE as a new session as described in clause 6.2.1.3 Session origination using PS media flow(s) only.

6. The SCC AS performs the Remote Leg Update using procedures defined in clause 6.3.1.5.

7. The SCC AS completes the session setup towards UE-1 according to procedures defined in TS 23.228 [4].

6.3.3.2 Local End Initiation case: Incorporating existing CS media in new IMS Session and Gm Service Control

The call flow in figure 6.3.3.2-1 presents a scenario where UE-1 adds PS media component(s) (e.g. video) and Gm Service Control Signalling Path to an existing multimedia session that only contains CS media. Following this scenario the session is controlled using ICS capability.

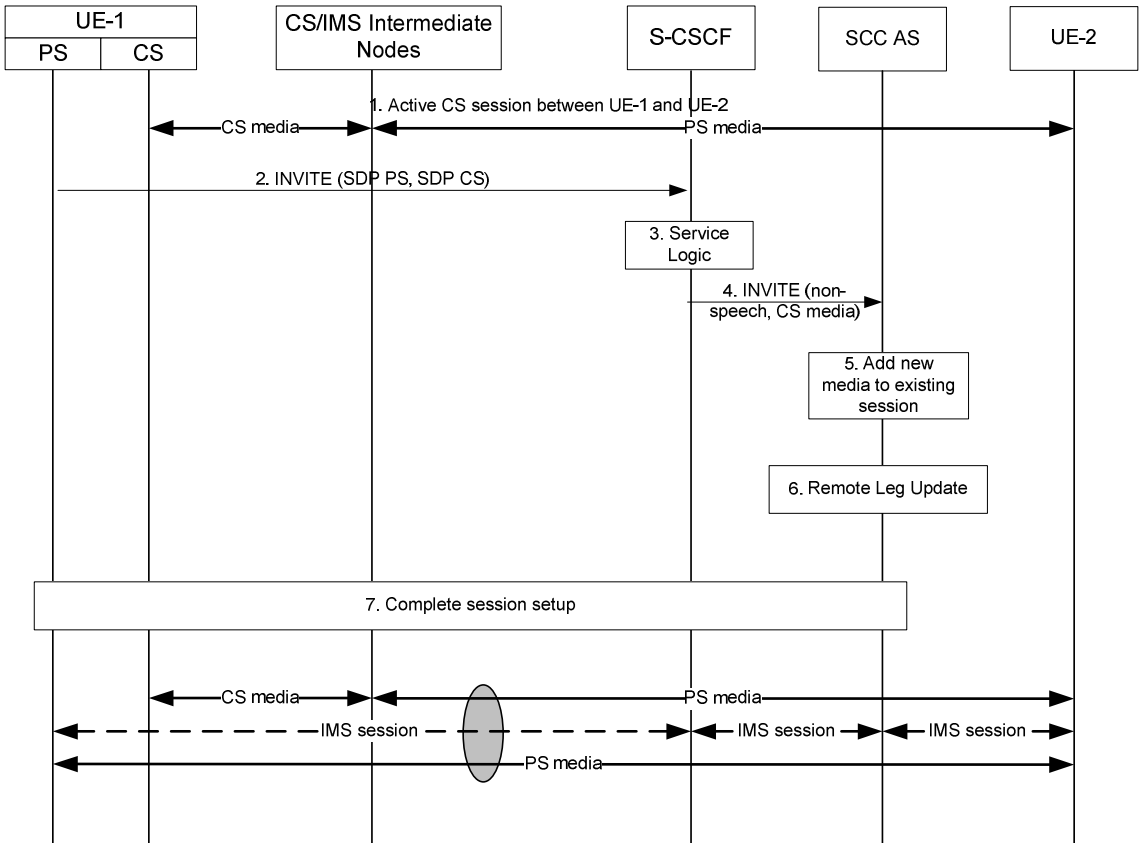

Figure 6.3.3.2-1: Local End Initiation case: Incorporating existing CS media in new IMS Session and Gm Service Control Signalling Path

1. A multimedia session between UE-1 and UE-2 is established as either originated or terminated session with CS media as described in TS 23.292 [5] clauses 7.3.2.1 and 7.4.2.1, respectively i.e. UE-1 is not using the ICS capability and therefore not using the Gm reference point during the session establishment.

2. UE-1 requests to add one or more PS media component(s) and to control the CS media using ICS capabilities by an INVITE towards SCC AS to establish a new session. The request contains the description of the new PS media and indicates that control of the existing CS media is transferred to the new session. UE-1 provides information necessary for the SCC AS to identify the existing session and to request addition of the media flow to the existing session.

3. The S-CSCF executes any service logic as appropriate.

4. The S-CSCF sends the INVITE to the SCC AS.

5. The SCC AS determines that the INVITE is related to an existing session using the information provided by UE-1 and adds the new media flow to the session.

6. The SCC AS performs the Remote Leg update using procedures defined in clause 6.3.1.5.

7. The SCC AS completes the session setup towards UE-1 according to procedures defined in TS 23.228 [4].

6.3.3.3 Local End Initiation case: Adding PS media to IMS session with CS media

The call flow in figure 6.3.3.3-1 presents a scenario where UE-1 adds PS media component(s) (e.g. video) to an existing multimedia session that contains CS media and is controlled using ICS capability.

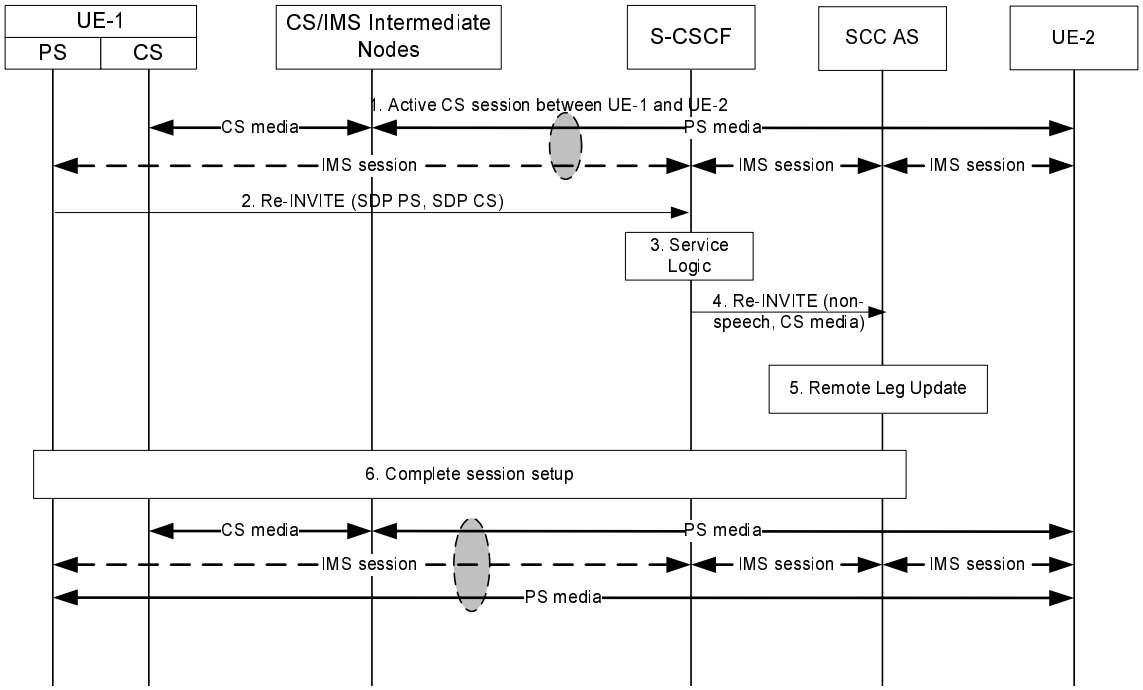

Figure 6.3.3.3-1: Local End Initiation case: Adding PS media to IMS session with CS media

1. An IMS session between UE-1 and UE-2 is established as either originated or terminated session with CS media as described in TS 23.292 [5] clauses 7.3.2.2.4 and 7.4.2.2.2.2, respectively i.e. UE-1 is using the ICS capability and therefore the Gm reference point during the session establishment.
2. UE-1 initiates a request to add the PS media flow(s) to the existing IMS session.
3. The S-CSCF executes any service logic as appropriate.
4. The S-CSCF sends the INVITE to the SCC AS.
5. The SCC AS performs the Remote Leg Update using procedures defined in clause 6.3.1.5.
6. The SCC AS completes the session setup towards UE-1 according to procedures defined in TS 23.228 [4].

6.3.3.4 Remote End Initiation case: Adding new PS media to existing CS session

The call flow in figure 6.3.3.4-1 presents a scenario where UE-1 has an existing CS session with UE-2 and UE-2 adds new media flow(s) to the session and the new media flow is delivered via PS access towards UE-1.

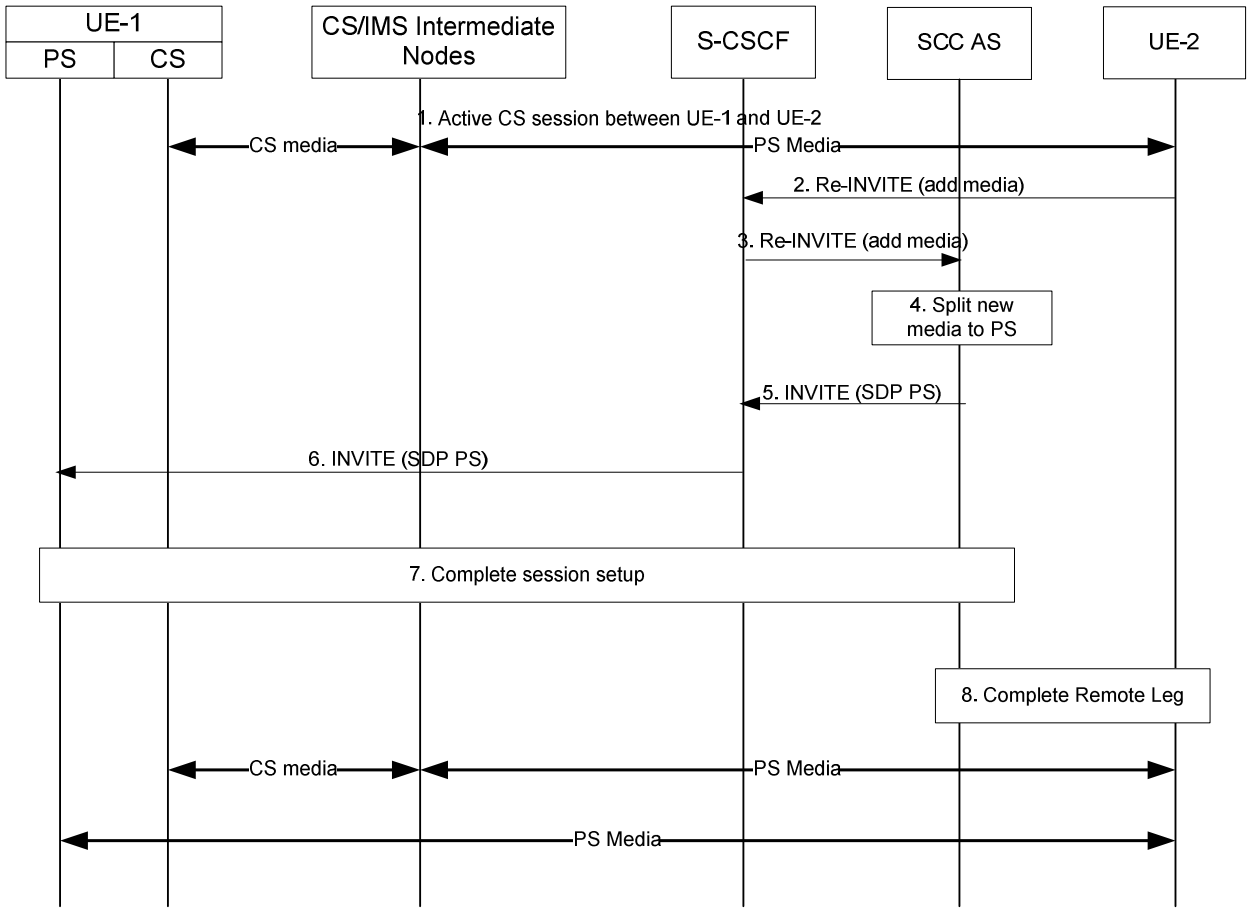

Figure 6.3.3.4-1: Remote End Initiation case: Adding new PS media to existing CS session

1. A CS session between UE-1 and UE-2 is established as either originated or terminated session with CS media as described in TS 23.292 [5] clauses 7.3.2.1 and 7.4.2.1, respectively, i.e. UE-1 is not using the ICS capability and therefore not using the Gm reference point during the session establishment.

2. S-CSCF receives a request from UE-2 to add new PS media flow(s) (e.g. video) to the existing session.

3. S-CSCF forwards the request to SCC AS, which is anchored on the session path.

4. The T-ADS function in the SCC AS decides that the new media flow is delivered to UE-1 via PS access and therefore splits the session. T-ADS in the SCC AS uses the C-MSISDN for correlation, and then ensures the split session is delivered only to UE-1, and not delivered to other UEs of the user.

5-6. SCC AS initiates a new session towards UE-1. The request includes the new PS media flow. The SCC AS includes enough information within the session request to allow UE-1 to correlate this new session with the existing CS session.

7. UE-1 accepts the new session and completes the session setup via PS access.

8. The SCC AS completes the Remote Leg towards UE-2 according to procedures defined in TS 23.228 [4].

6.3.3.5 Remote End Initiation case: Incorporating existing CS media in new IMS Session and Gm Service Control

The call flow in figure 6.3.3.5-1 presents a scenario where UE-1 has an existing CS session with UE-2 and UE-2 adds new media flow(s) to the session. The new media flow(s) is delivered via PS access towards UE-1 and Gm Service Control Signalling Path is added. Following this scenario the session is controlled using ICS capability.

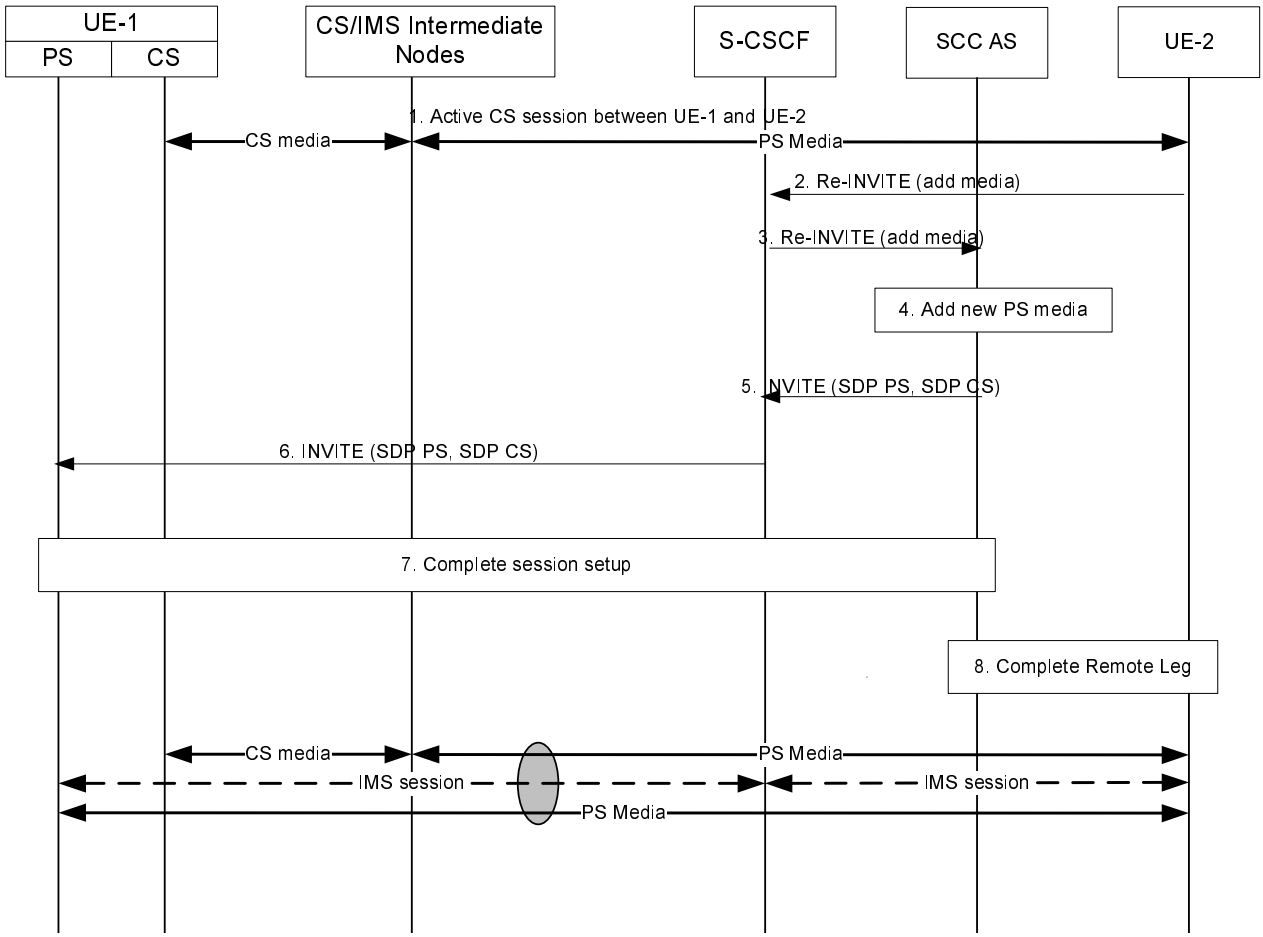

Figure 6.3.3.5-1: Remote End Initiation case: Incorporating existing CS media in new IMS Session and Gm Service Control Signalling Path

1. A CS session between UE-1 and UE-2 is established as either originated or terminated session with CS media as described in TS 23.292 [5] sections 7.3.2.1 and 7.4.2.1, respectively i.e. UE-1 is not using the ICS capability and therefore not using the Gm reference point during the session establishment.

2. S-CSCF receives a request from UE-2 to add new PS media flow (e.g. video) to the existing session.

3. S-CSCF forwards the request to SCC AS, which is anchored on the session path.

4. The T-ADS function in the SCC AS decides that the new media flow is delivered to UE-1 via PS access and therefore initiates a new session using the Gm reference point using ICS capabilities as specified in TS 23.292 [5]. SCC AS decides to establish the Gm Service Control Signalling Path together with the media addition using the ICS capability. T-ADS in the SCC AS uses the C-MSISDN for correlation, and then ensures the new session is delivered only to UE-1, and not delivered to other UEs of the user.

5-6. SCC AS initiates a new session towards UE-1. The request includes the new PS media and indicates that the existing CS media is moved to and controlled over this session.

7. UE-1 accepts the new session and completes the session setup via PS access.

8. The SCC AS completes the Remote Leg towards UE-2 according to procedures defined in TS 23.228 [4].

6.3.3.6 Remote End Initiation case: Adding PS media to IMS session with CS media

The call flow in figure 6.3.3.6-1 presents a scenario where UE-1 has an existing session that contains CS media and Gm Service Control Signalling Path with UE-2 and UE-2 adds new media to the session. The new media is delivered together with the Gm Service Control Signalling Path towards UE-1.

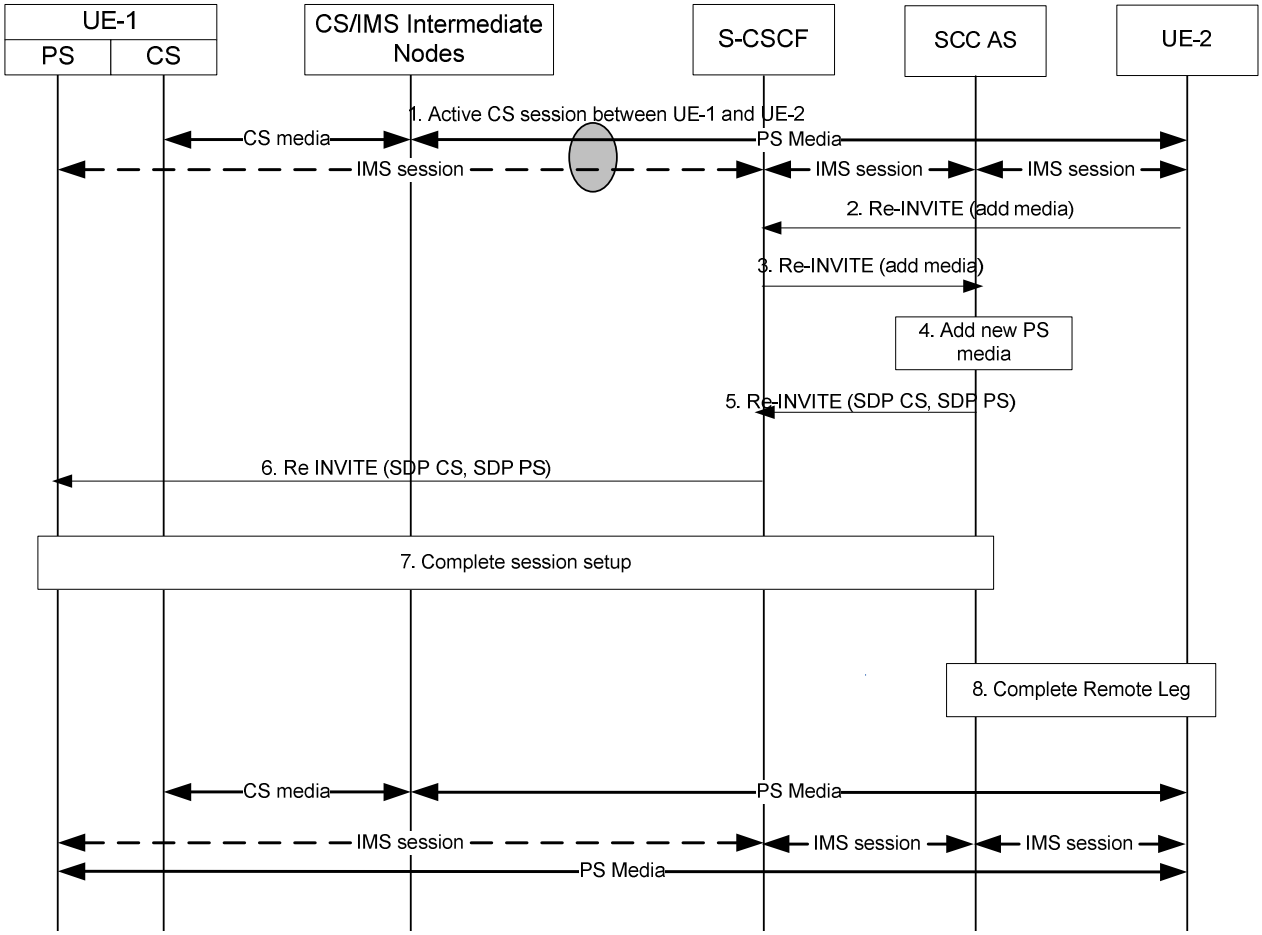

Figure 6.3.3.6-1: Remote End Initiation case: adding PS media to IMS session with CS media

1. A CS session between UE-1 and UE-2 is established as either originated or terminated session with CS media as described in TS 23.292 [5] clauses 7.3.2.2.4 and 7.4.2.2.2.2, respectively i.e. UE-1 is using the ICS capability and therefore the Gm reference point during the session establishment.

2. S-CSCF receives a request from UE-2 to add new PS media flow(s) (e.g. video) to the existing session.

3. S-CSCF forwards the request to SCC AS, which is anchored on the session path.

4. The T-ADS function in the SCC AS decides that the new media flow is delivered to UE-1 via PS access. The SCC decides to add the PS media to the existing Service Control Signalling Path that is established via Gm.

5-6. SCC AS initiates a request to add the PS media to the existing Service Control Signalling Path towards UE-2.

7. UE-1 accepts the new session and completes the session setup via PS access.

8. The SCC AS completes the Remote Leg towards UE-2 according to procedures defined in TS 23.228 [4].

6.3.3.7 Local End Initiation case – Removing media from split CS and PS sessions

The call flow in figure 6.3.3.7-1 presents a scenario where UE-1 has a CS call and an IMS multimedia session with the remote end in a manner that they are presented to UE-2 as one IMS session by the SCC AS and then removes PS media flow(s) by releasing the PS Access Leg.

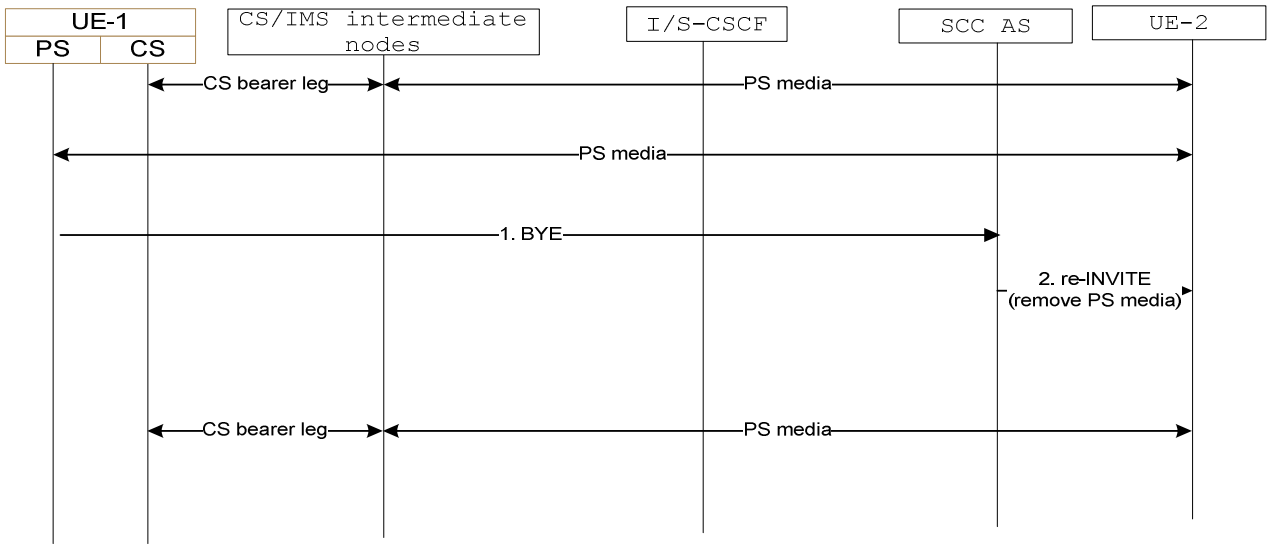

Figure 6.3.3.7-1: Local End Initiation case – Removing media from split CS and PS sessions

1. UE-1 uses standard IMS procedures defined in TS 23.228 [4] to remove one or more PS media flows from the session.

2. SCC AS sends a re-INVITE to UE-2 to remove the associated PS media flow(s) from the session. The SCC AS terminates the Source Access Leg as defined in 6.3.1.6.

6.3.3.8 Remote End Initiation case – Removing media from split CS and PS sessions

The call flow in figure 6.3.3.8-1 presents a scenario where UE-1 has a CS call and an IMS multimedia session with the remote end in a manner that they are presented to UE-2 as one IMS session by the SCC AS and where as a result of UE-2 requesting to remove PS media flow(s), the SCC AS terminates the Access Leg associated with the PS media flow(s).

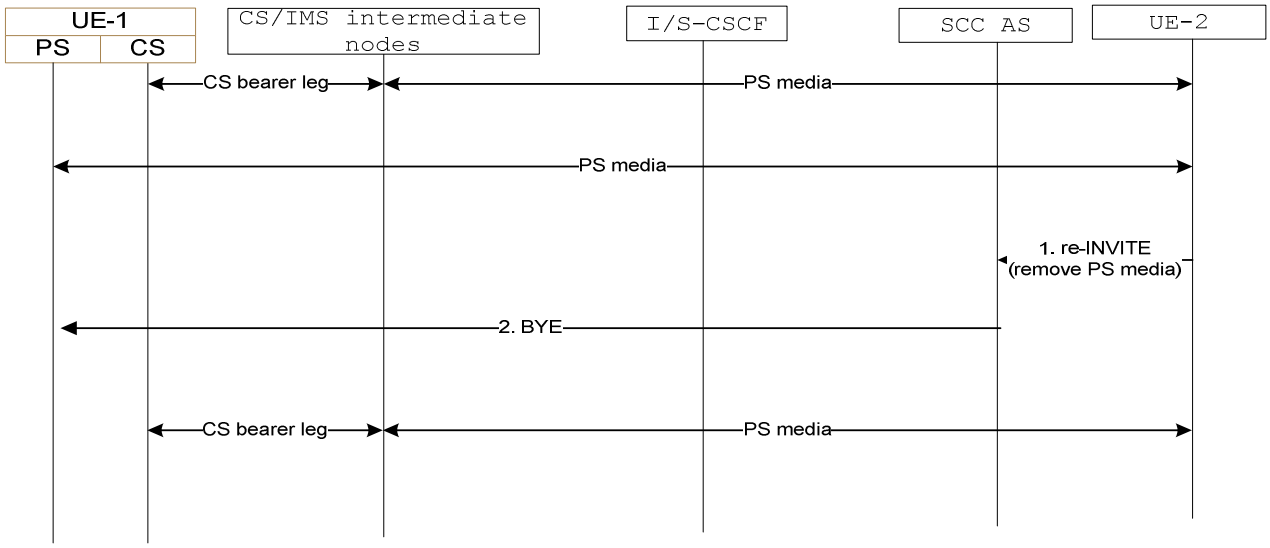

Figure 6.3.3.8-1: Remote End Initiation case – Removing media from split CS and PS sessions

1. UE-2 uses standard IMS procedures defined in TS 23.228 [4] to remove one or more PS media flow(s) from the session.

2. SCC AS identifies the session from UE-2 as being split into two legs to UE-1. It determines the appropriate Access Leg over which to send the updated session information from UE-2. Since there is only a single PS media flow associated with the session, the SCC AS terminates the Access Leg associated with the PS media flow.

6.3.3.9 Local End Initiation case: Adding new PS media to existing PS session

This clause covers the scenario where UE 1 adds PS media flow(s) (e.g. video) over a new IP-CAN, IP-CAN2, to an existing multimedia session that uses PS media over IP-CAN1. As a post condition the UE 1 has an ongoing multimedia session with the remote end.

The call flow is the same as in figure 6.3.3.3-1 except that both the original media and the added media are on PS accesses and no CS intermediate nodes are involved.

6.3.3.10 Remote End Initiation case: Adding new PS media to existing PS session

This clause covers the scenario where UE 1 has an existing PS session with UE 2 using PS media over IP-CAN1 and UE 2 adds new media to the session and the new media flow is delivered using PS media over IP-CAN2 towards UE-1.

The call flow is the same as in clause 6.3.3.4 *Remote End Initiation case: Adding new PS media to existing CS session*, except that both the original media flow and the added media flows are on PS accesses and no CS intermediate nodes are involved. Consequently:

- in step 4. of the call flow, the T-ADS function in the SCC AS decides that the new media is delivered to UE 1 via PS through the access networks type corresponding to IP-CAN2;

- in step 5. of the call flow, the SCC AS includes enough information within the session request to ensure that the S-CSCF establishes the new session via the selected access networks type.

6.3.3.11 Local End Initiation case: Removing media from split PS sessions

This clause covers the scenario where local end UE-1 removes media flows from split PS sessions. As a precondition, UE-1 has an IMS multimedia session with the remote end. As a post-condition, UE-1 removes the PS session over one IP-CAN and continues IMS multimedia session with the remote end over the other IP-CAN.

The call flow is the same as in figure 6.3.3.7-1 except that all the media components are on PS accesses and no CS intermediate nodes are involved.

6.3.3.12 Remote End Initiation case: Removing media from split PS sessions

This clause covers the scenario where remote end UE-2 removes media flow(s) from split PS sessions. As a precondition, UE-1 has an IMS multimedia session with the remote end. As a post-condition, the PS session over one IP-CAN is removed and UE-1 continues IMS multimedia session with the remote end over the other IP-CAN.

The call flow is the same as in figure 6.3.3.8-1 except that all the media components are on PS accesses and no CS intermediate nodes are involved.

6.3.4 Void

6.4 Operator Policy and User Preferences

Operator Policy is provisioned in the network by the operator, and should be communicated to the UE during initial provisioning or via OMA Device Management [7]. Operator policy should be communicated to the UE, via OMA Device Management, whenever the policy is updated by the operator.

Operator policy shall indicate, for each supported type of media or group of media:

- a list of access networks that are restricted for originating sessions and Access Transfer;

- a list of preferred access networks (in order of priority) to be used by the UE with SC capabilities for originating sessions and Access Transfer, when those access networks become available and Access Transfer is possible;

- whether the UE with SC capabilities "shall"/"should"/"may" start transferring media flow(s) to target access networks with higher priorities than the current access network, when the target access networks become available and Access Transfer is possible;

- by indicating "shall" the operator mandates the UE to start Access Transfer according to the home operator's list of preferred access networks as soon as possible;
- by indicating "should" the operator recommends the UE to start Access Transfer according to the home operator's list of preferred access networks, if Access Transfer is possible and desirable after having taken into account the Local Operating Environment Information;
- by indicating "may" the operator leaves the UE free to decide whether or not to start Access Transfer in accordance with user preferences (when configured), if Access Transfer is possible and desirable after having taken into account the Local Operating Environment Information. Whenever user preferences are not configured, the UE shall to take into account the home operator's list of preferred access networks;

- whether to keep or drop non transferable media flow(s) in the case of partial Access Transfer.

NOTE 1: Operator policy for Access Transfer needs to be consistent with operator policy for T-ADS.

User preferences may indicate for example:

- preferred access/domain, i.e. CS preferred or IMS preferred, and which IP-CAN within IMS.

The Local Operating Environment Information is implementation specific and may comprise of such items as, radio environment information, quality of IP connection (jitter, delay and packet loss), application specific requirements, memory considerations, power considerations, etc.

The UE shall take in account operator policy, user preferences and the Local Operating Environment Information when deciding which access to use for outgoing sessions, performing UE assisted T-ADS, or before considering initiating Access Transfer.

NOTE 2: If the "IMS voice over PS Session Supported Indication" indicator, see TS 23.060 [27] and TS 23.401 [28], is not set for a specific 3GPP IP-CAN, this IP-CAN can not be used for voice, even if set to preferred by the user preferences.

6.5 Execution of supplementary services

6.5.1 General

This clause describes the SCC AS and UE procedures for execution of supplementary service as described in TS 22.173 [15].

The related interactions apply to scenarios when the media components for the UE are split into multiple Access Legs due to IMS Service Continuity procedures. The Remote Leg is presented with one session including all the media components.

For Access Leg where CS media is used, the interaction described in the following sections still applies and the service request should be sent via PS Access Leg. The operations on the CS media flows shall be handled based on the service request and shall follow the procedures as described in TS 23.292 [5].

When service invocation fails on one Access Leg, the UE and the SCC AS may retry on a different Access Leg.

6.5.2 Originating Identification Presentation (OIP)

The OIP service is not impacted.

6.5.3 Originating Identification Restriction (OIR)

The OIR service is not impacted.

6.5.4 Terminating Identification Presentation (TIP)

The TIP service is not impacted.

6.5.5 Terminating Identification Restriction (TIR)

The TIR service is not impacted.

6.5.6 Communication Diversion (CDIV)

Upon receiving an incoming session split across multiple Access Legs, if an UE wants to invoke the CDIV service, the UE may use any of the Access Legs to invoke the CDIV service following the procedures defined in TS 24.604 [21].

When the SCC AS splits an incoming session into multiple Access Legs and receives a CDIV request from the UE on any of the Access Legs, the SCC AS shall terminate the other Access Leg(s) and shall invoke the CDIV service following the procedures defined in TS 24.604 [21].

6.5.7 Communication Hold (HOLD)

If the UE wants to invoke the HOLD service on one or more media component(s) and the UE has multiple Access Legs, the UE shall invoke the HOLD procedures, as defined in TS 24.610 [16] on all the Access Legs which contain the affected media component(s). The SCC AS shall update the remote Access Leg using the procedures defined in TS 24.610 [16].

If the remote end initiates the HOLD service on one or more media component(s) and the UE has multiple Access Legs, the SCC AS shall forward the HOLD request on all the Access Legs which contain the affected media component(s).

6.5.8 Communication Barring (CB)

The CB service is not impacted.

6.5.9 Message Waiting Indication (MWI)

The MWI service is not impacted.

6.5.10 Conference (CONF)

When the UE wants to invoke the CONF services and has multiple Access Legs, the UE may send any CONF related requests, e.g. subscribe request for conference package or refer request to the conference, as defined in TS 24.605 [17], on any of the Access Legs.

When the UE has multiple Access Legs and the remote end sends a request for the CONF service to replace an existing session within the same dialog, the SCC AS may deliver the request for CONF service on any of the Access Legs.

When the UE has multiple Access Legs and receives a request on one of the Access Legs for a CONF service to replace an existing session, the UE shall follow the procedures specified in TS 24.605 [17] to establish a new session to the conference focus.

When the UE has multiple Access Legs and receives a request for a CONF service to replace an existing session outside the dialog, the UE shall follow the procedures specified in TS 24.605 [17] to establish a new session to the conference focus.

6.5.11 Explicit Communication Transfer (ECT)

When the UE acts as the transferor UE and has multiple Access Legs, the UE may send the request for ECT service, as specified in TS 24.629 [18], on any of the Access Legs.

When the UE acts as the transferee UE and has multiple Access Legs, the SCC AS may deliver the request for ECT service on any of the Access Legs.

When the UE has multiple Access Legs and receives an ECT request on one of the Access Legs, the UE shall follow the procedures specified in TS 24.629 [18] to establish a new session to the Transfer Target.

6.5.12 Advice of Charge (AOC)

When the AOC service specified in TS 24.647 [19] is active and the UE has multiple Access Legs, the SCC AS may deliver charging information during the communication to the UE over any of the Access Legs.

6.5.13 Closed User Groups (CUG)

The CUG service is not impacted.

6.5.14 Three-Party (3PTY)

The 3PTY service in TS 24.605 [17] is considered as a special case of CONF service and the interaction with Session Transfer is the same as that specified in clause 6.5.10 for CONF service.

6.5.15 Flexible Alerting (FA)

The FA service is not impacted.

6.5.16 Communication Waiting (CW)

Upon receiving an incoming session split across multiple Access Legs, if an UE wants to invoke the CW service, the UE may use any of the Access Legs to invoke the CW service following the procedures defined in TS 24.615 [22].

When the SCC AS splits an incoming session into multiple Access Legs and receives a CW request from the UE on any of the Access Legs, the SCC AS shall invoke the CW service following the procedures defined in TS 24.615 [22].

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

The CCBS/CCNR service is not impacted.

6.5.18 Customized Alerting Tones (CAT)

The CAT service is not impacted.

6.5.19 Malicious Communication IDentification (MCID)

When invoking the MCID service in temporary subscription mode and there are multiple active Access Legs for the session, the UE may send the re-INVITE request for invoking MCID service as defined in TS 24.616 [20] on any of the Access Legs.

6.5.20 Reverse Charging

The Reverse Charging service is not specified.

6.5.21 Personal Network Management (PNM)

The PNM service is not specified.

6.5.22 Customized Ringing Signal (CRS)

The CRS service is not specified.

6a Procedures and flows for Inter-UE Transfer

6a.0 Introduction

In the following procedures and flows the UEs involved in IUT are labelled as UE-1, UE-2, etc. while the remote endpoint of the session is labelled as Remote Party. Flows are shown for IUT procedures establishing Collaborative Sessions as well as IUT procedures without establishing a Collaborative Session.

6a.0.1 Void

6a.1 IUT general procedures

6a.1.1 General

In all general IUT procedures the sessions are anchored in an SCC AS. These procedures do not apply for emergency sessions.

6a.1.2 Remote Leg Update

Remote Leg Update for IUT procedures are executed as shown in figures 6.3.1.5-1 and 6.3.1.5-2, in which the media descriptions applicable after the IUT procedure are communicated to the remote UE. For an IUT procedure without establishing a Collaborative Session, the information of the new local end which continues the session with the remote end is also included.

6a.2 Information flows for Collaborative Session establishment

6a.2.1 Establish Collaborative Session by transferring media

There is an ongoing session between UE-1 and a remote party, which is anchored at the SCC AS. UE-1 transfers the media flow from UE-1 to UE-2 to establish a Collaborative Session. Following is an information flow for the Collaborative Session establishment procedure when UE-1 initiates media transfer from UE-1 to UE-2. After the transfer, the UE-1 becomes Controller UE, and UE-2 becomes Controllee UE.

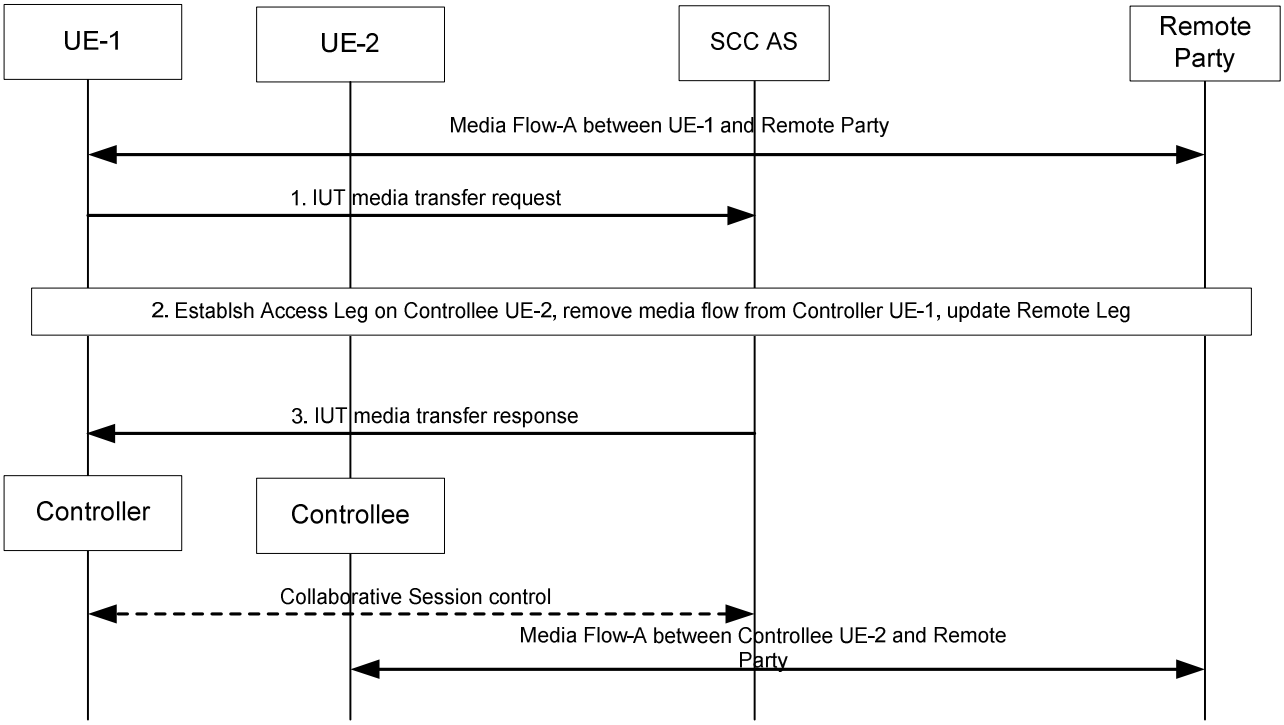

Figure 6a.2.1-1: Establish Collaborative Session by transferring media

1. UE-1 sends an IUT media transfer request to the SCC AS to transfer Media Flow-A from UE-1 to UE-2. The IUT media transfer request shall include the enough information for the SCC AS to:

   - identify that the transferred media flow is Media Flow-A;
   - identify that the target of the transferred media flow is UE-2;
   - keep the control of the Collaborative Session in UE-1.

2. The SCC AS sends request to establish Access Leg at UE-2 for Media Flow-A. The SCC AS removes Media Flow-A from UE-1, and updates the Remote Leg using the Remote Leg Update procedure as specified in clause 6a.1.2.

3. The SCC AS sends an IUT media transfer response to UE-1. A Collaborative Session is established, for which UE-1 becomes the Controller UE and UE-2 becomes a Controllee UE.

When the above transfer is completed the SCC AS retains the service state (e.g. media flows status) of UE-1 and UE-2, and UE-1 retains the control of the Collaborative Session.

NOTE 1: UE-1 can transfer other media flows from UE-1 by repeating the above steps 1-3.

NOTE 2: If, besides Media Flow-A, there are other media flows between UE-1 and the remote party, these other media flows shall not be impacted by the above Inter-UE Transfer operation, i.e. these other media flows remain on UE-1.

6a.2.2 Establish Collaborative Session with new media

The following information flow shows the Collaborative Session establishment procedure. There is an ongoing IMS session with Media Flow-A between UE-1 and a remote party, which is anchored at the SCC AS. UE-1 wants to add a new Media Flow-B on another UE-2 to the current ongoing IMS session to establish a Collaborative Session.

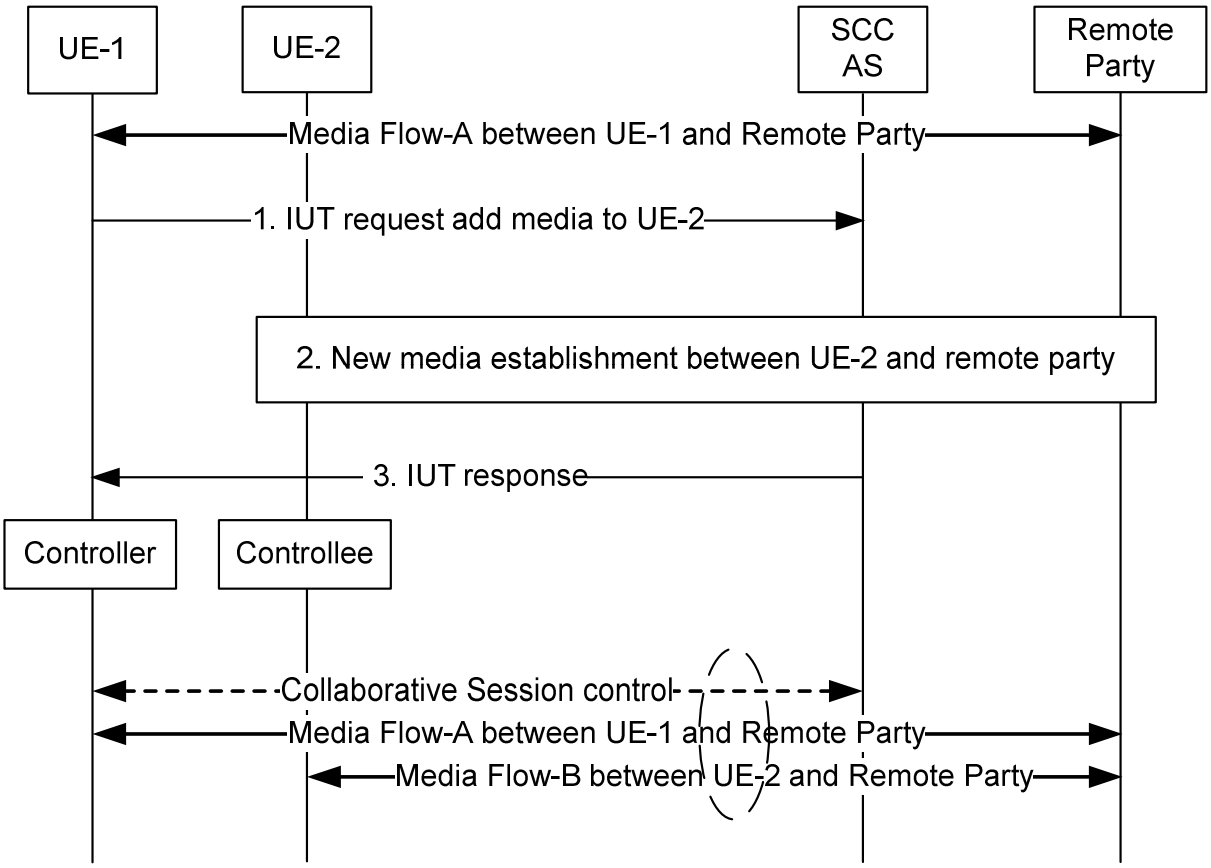

Figure 6a.2.2-1: Flow for Collaborative Session establishment with new media flow on another UE

1. UE-1 decides to add a new Media Flow-B to UE-2. It sends an IUT add media request to the SCC AS, indicating that a new Media Flow-B will be added to UE-2. The request shall include enough information for the SCC AS to:

   - identify that the added media flow is Media Flow-B;
   - identify that the target of the added media flow is UE-2;
   - keep the control of the Collaborative Session in UE-1;

2. The SCC AS sends the IUT add media request to UE-2, indicating that a new Media Flow-B will be created on UE-2. Media Flow-B between UE-2 and remote party is established. The Remote Leg is updated accordingly.

3. After the successful establishment of the Media Flow-B on UE-2, the SCC AS sends an IUT add media response back to UE-1. A Collaborative Session is established, for which UE-1 becomes the Controller UE and UE-2 becomes a Controllee UE and Media Flow-A and Media Flow-B become part of the Collaborative Session under the control of UE-1..

6a.3 Media Transfer within Collaborative Session

6a.3.1 Controller UE initiated media transfer from Controller UE to Controllee UE

A Collaborative Session is already established using procedures shown in clause 6a.2. Following is an information flow for UE-1 performing media transfer to UE-2; after the transfer, the UE-1 keeps the role of the Controller UE, and UE-2 is Controllee UE. If UE-2 is not involved in the Collaborative Session controlled by UE-1 before the media transfer, there is at least another Controllee UE involved in the Collaborative Session before the media transfer, which is not shown in the information flow.

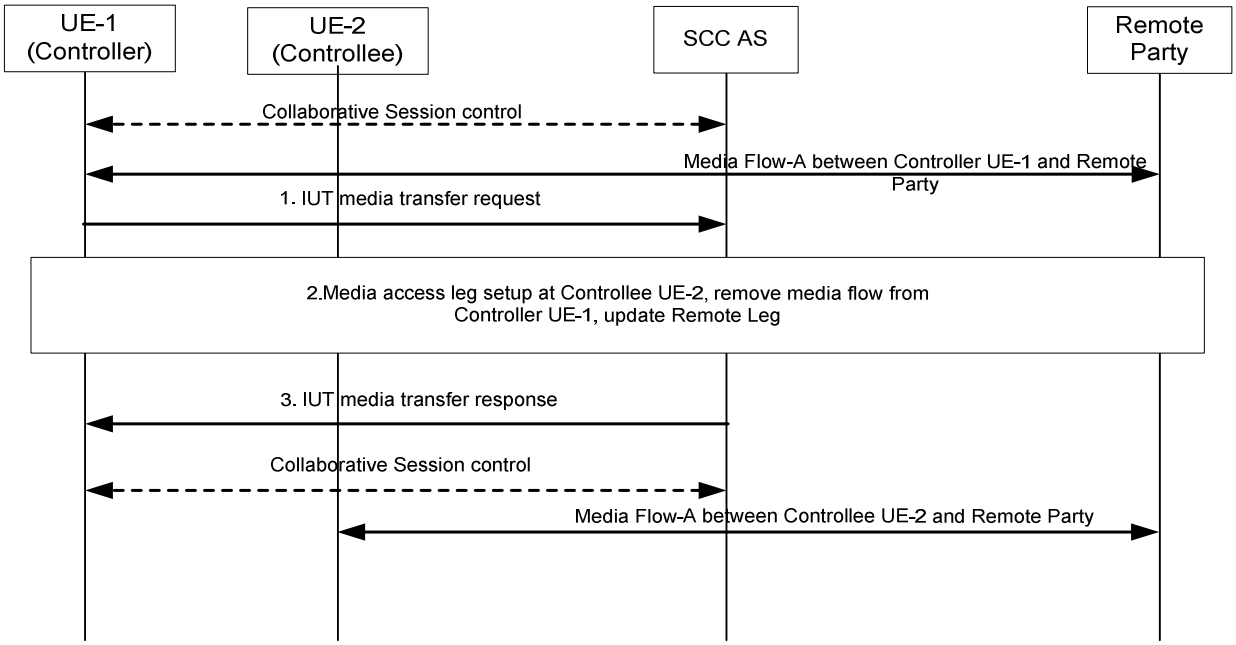

Figure 6a.3.1-1: Controller UE initiated media transfer from Controller UE to Controllee UE

1. UE-1 sends IUT media transfer request to the S-CSCF to transfer the Media-A from UE-1 to UE-2. The IUT media transfer request shall include the enough information for the SCC AS to:

   - identify that the transferred media flow is Media Flow-A;
   - identify that the source of the transferred media flow is UE-1;
   - identify that the target of the transferred media flow is UE-2;
   - keep the control of the Collaborative Session in UE-1.

2. The SCC AS sends transfer request to establish a session with UE-2 for the Media Flow-A, removes Media Flow-A from UE-1, and updates the Remote Leg using the Remote Leg Update procedure as specified in clause 6a.1.2.

3. The SCC AS sends media transfer response to UE-1.

When the above transfer is completed the SCC AS retains the service state (e.g. media flows status) of UE-1 and UE-2, and the UE-1 retains the control of the Collaborative Session.

NOTE 1: UE-1 can transfer other media flows from UE-1 by repeating the above steps 1-3.

NOTE 2: If, besides the Media Flow-A, there are other media flows in the Collaborative Session, these other media flows shall not be impacted by the above Inter-UE Transfer operation.

6a.3.2 Controller UE initiated media transfer from Controllee UE to Controller UE

A Collaborative Session is already established using procedures shown in clause 6a.2, the UE-1 keeps the role of the Controller UE, and UE-2 is Controllee UE. Following is an information flow for UE-1 initiating media transfer from UE-2 to UE-1.

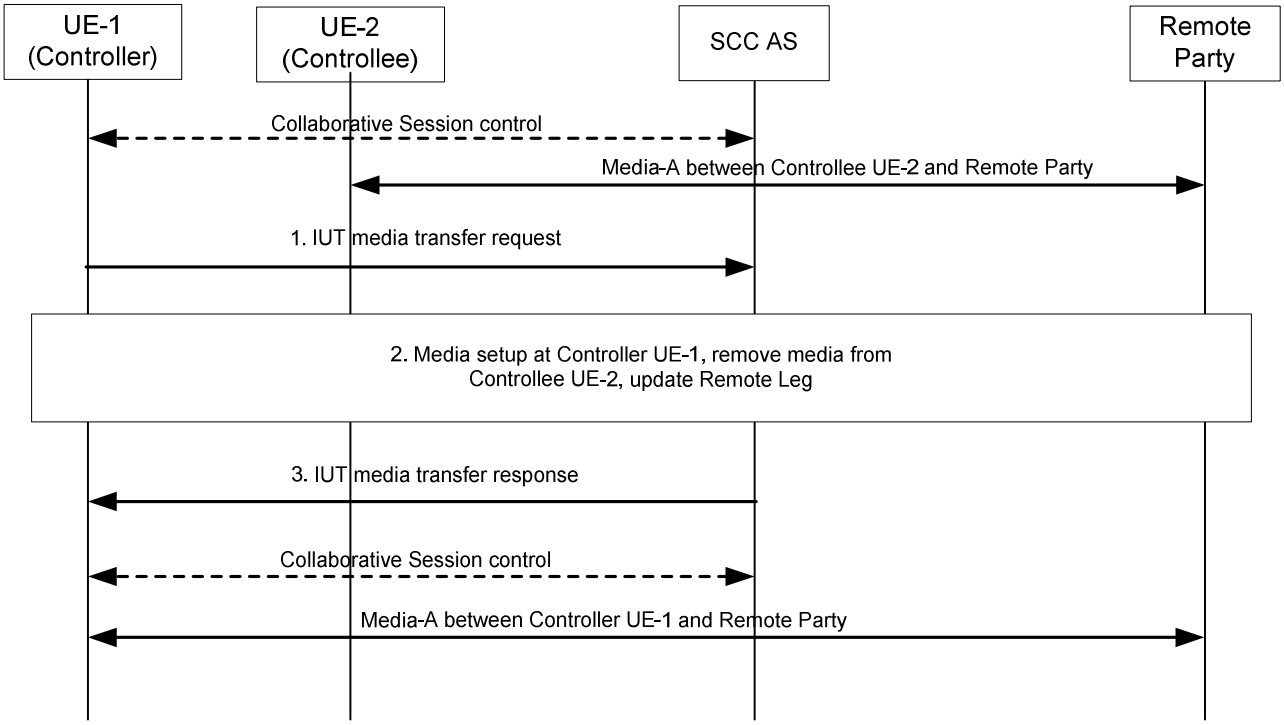

Figure 6a.3.2-1: Controller UE initiated media transfer from Controllee UE to Controller UE

1. UE-1 sends IUT media transfer request to the SCC-AS to transfer the Media-A from UE-2 to UE-1. The IUT media transfer request shall include the enough information for the SCC AS to:

   - identify that the transferred media flow is Media-A;
   - identify the source of the media flow is UE-2;
   - identify that the target of the transferred media flow is UE-1;

2. The SCC AS initiates the transfer by setting up Media-A towards Controller UE-1, removing Media-A from Controllee UE-2, and updates the Remote Leg using the Remote Leg Update procedure as specified in clause 6a.1.2. After the transfer, Media-A will be between Controller UE-1 and remote party.

NOTE 1: If no more media flow remains on the access leg between SCC AS and Controllee UE-2, the Access Leg between UE-2 and the SCC AS is released and Controllee UE-2 will no longer be part of the Collaborative Session.

3. The SCC AS sends media transfer response to UE-1.

When the above transfer is completed the SCC AS retains the service state (e.g. media flows status) of UE-1 and UE-2, and the UE-1 retains the control of the Collaborative Session.

NOTE 2: UE-1 can transfer other media flows from UE-2 by repeating the above steps 1-3.

NOTE 3: If, besides Media-A, there are other media flows in the Collaborative Session, these other media flows shall not be impacted by the above Inter-UE Transfer operation.

6a.3.3 Controller UE initiated media transfer from Controllee UE to another Controllee UE

UE-1, UE-2 and UE-3 are engaged in a Collaborative Session established using procedures shown in clause 6a.2 for which UE-1 is the Controller UE and UE-2 is a Controllee UE. There is media flow, Media-A, between UE-2 and Remote Party. The following figure presents an information flow of UE-1 performing IUT media transfer from UE-2 to UE-3 after which UE-1 retains the role of the Controller UE and UE-3 becomes Controllee UE. The following information flow applies to cases in which UE-3 may or may not be part of Collaborative Session before the media transfer.

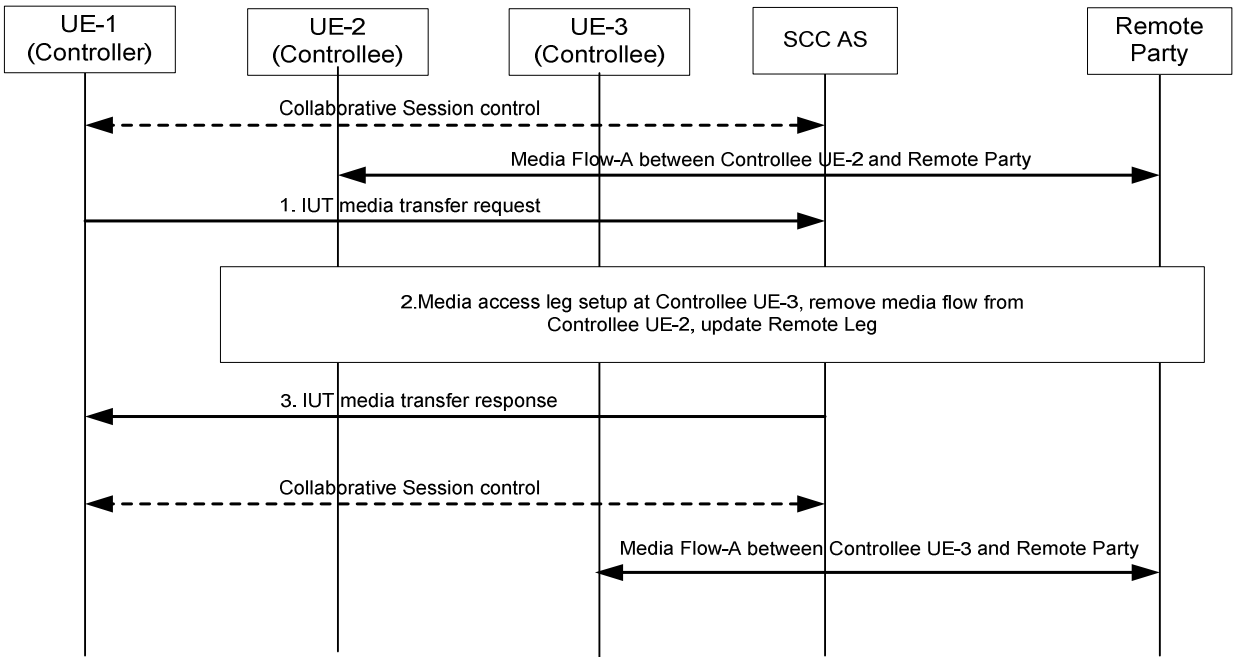

Figure 6a.3.3-1: Controller UE initiated media transfer from Controllee UE to another Controllee UE

1. UE-1 sends IUT media transfer request to the SCC AS to transfer the Media-A from UE-2 to UE-3. The IUT media transfer request shall include the enough information for the SCC AS to:

   - identify that the transferred media flow is Media Flow-A;

   - identify that the target of the transferred media flow is UE-3;

   - keep the control of the Collaborative Session in UE-1.

2. The SCC AS sends request to establish Access Leg on UE-3 for Media Flow-A, removes Media Flow-A from UE-2, and updates the Remote Leg using the Remote Leg Update procedure as specified in clause 6a.1.2.

3. The SCC AS sends media transfer response to UE-1.

When the Inter-UE Transfer is completed UE-1 keeps the Collaborative Session control.

NOTE 1: UE-1 can transfer other media flows from UE-2 by repeating the above steps 1-3.

NOTE 2: If, besides the Media Flow-A, there are other media flows in the Collaborative Session, these other media flows shall not be impacted by the above Inter-UE Transfer operation.

6a.3.4 Void

6a.4 Media adding/deleting/releasing within Collaborative Session

6a.4.1 Controller UE initiated add new media on Controller UE

UE-1, UE-2 are engaged in a Collaborative Session established using procedures shown in clause 6a.2 for which UE-1 is the Controller UE and UE-2 is a Controllee UE, which has a media flow-A with the remote party. The following flows shows how the Controller UE-1 adds a media flow-B to itself, which may result in a new Access Leg, or it could be an additional media flow for an already existing session for the Controller UE-1.

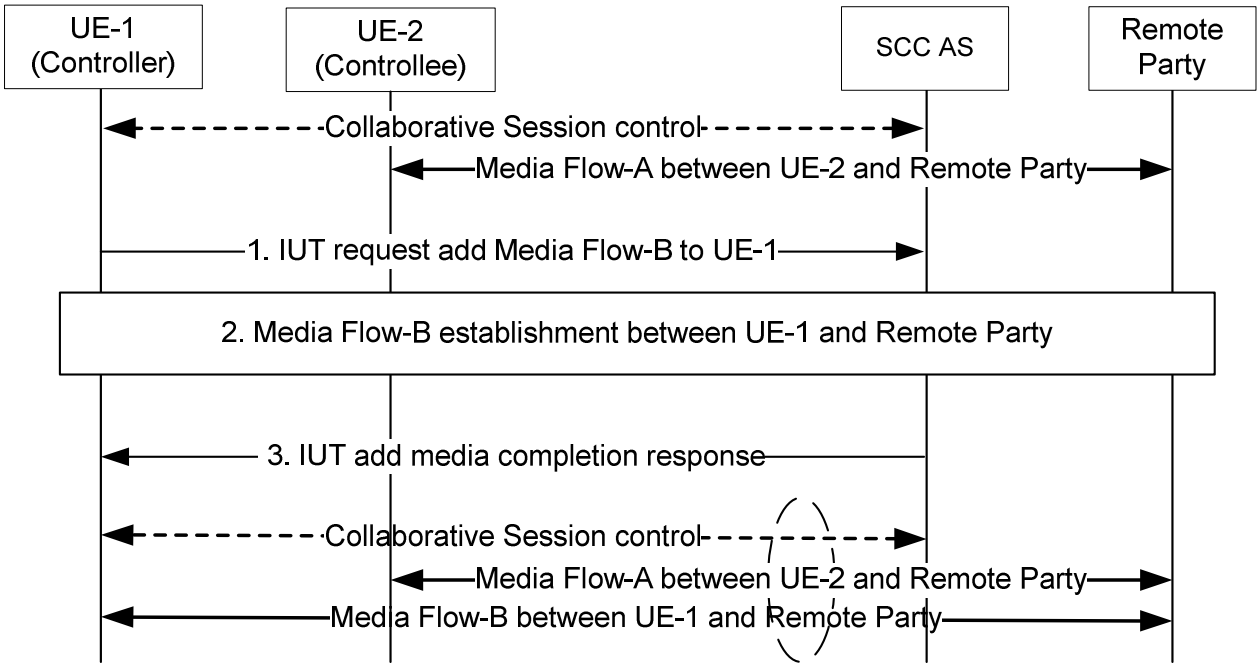

Figure 6a.4.1-1: Controller UE initiated add new media On Controller UE

1. Controller UE-1 decides to add a new media flow-B to itself, and performs an IUT add media request for the particular media requested. The IUT media transfer request shall include enough information for the SCC AS to:

   - identify that the added media flow is media flow-B;

   - identify that the target of the added media flow is the Controller UE-1 itself;

2. The new media flow-B is setup for Controller UE-1, and the Remote Leg is updated as well with the newly added media flow-B using the Remote Leg Update procedure as specified in clause 6a.1.2. After this, the new media flow-B will be established between the Controller UE-1 and the Remote Party.

3. The IUT addition of media is completed.

6a.4.2 Controller UE initiated add new media on Controllee UE

UE-1, UE-2 are engaged in a Collaborative Session established using procedures shown in clause 6a.2 for which UE-1 is the Controller UE and UE-2 is a Controllee UE, the following flows shows how the Controller UE-1 adds a media flow to Controllee UE-2 which could result in a new Access Leg for the Controllee UE-2, or it could be an additional media flow for an already existing session for the Controllee UE-2. The following information flow also applies to case in which UE-2 may not be part of Collaborative Session before the media addition. In this case, there is at least another Controllee UE involved in the Collaborative Session before the media addition, which is not shown in the information flow.

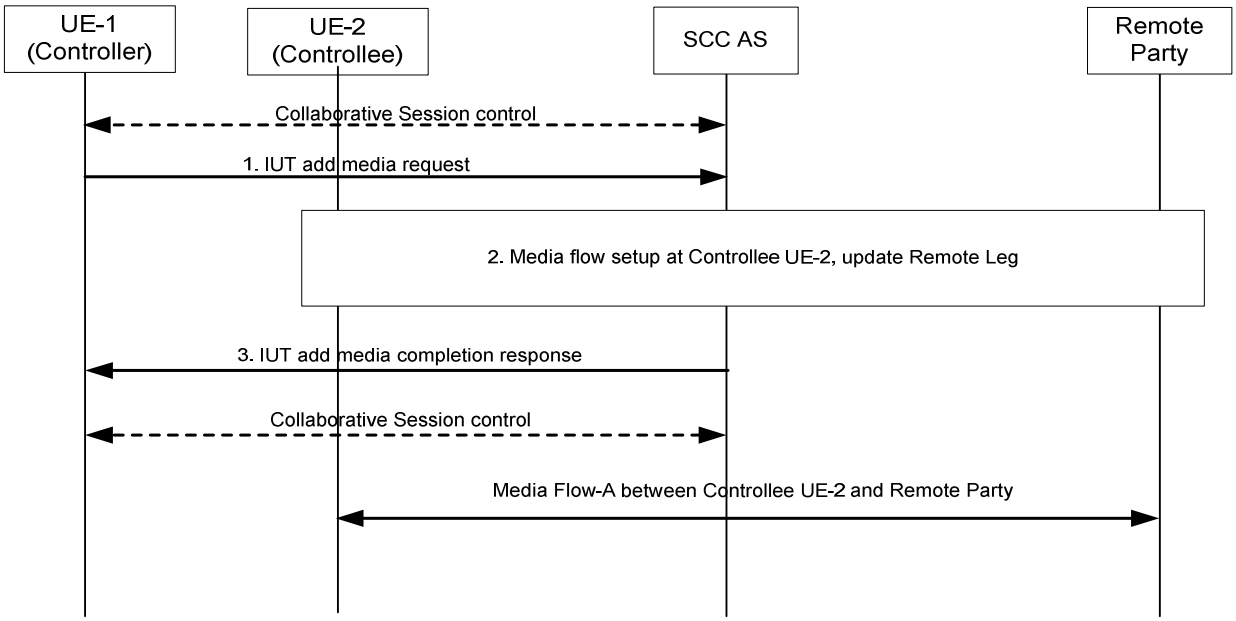

Figure 6a.4.2-1: Controller UE initiated add new media On Controllee UE

1 Controller UE-1 decides to add a new media flow to Controllee UE-2, and performs an IUT add media request for the particular media requested. The IUT add media request shall include enough information for the SCC AS to:

- identify that the added media flow is Media Flow-A;
- identify that the target of the added media flow is Controllee UE-2.

2 The new Media Flow-A is setup for Controllee UE-2. The Remote Leg is updated as well with the newly added media flow using the Remote Leg Update procedure as specified in clause 6a.1.2. After this, the new media flow will be established between Controllee UE-2 and the Remote Party.

3. The IUT addition of media is completed.

6a.4.3 Controller UE Initiated Release Media (media flow on the Controller UE)

The information flow shows the Controller UE releasing a media flow that is originated from the Controller UE. As a pre-requisite, there exists a Collaborative Session with two media flows, flow–A on the Controller UE (UE-1) and Flow–B on the Controllee UE (UE-2).

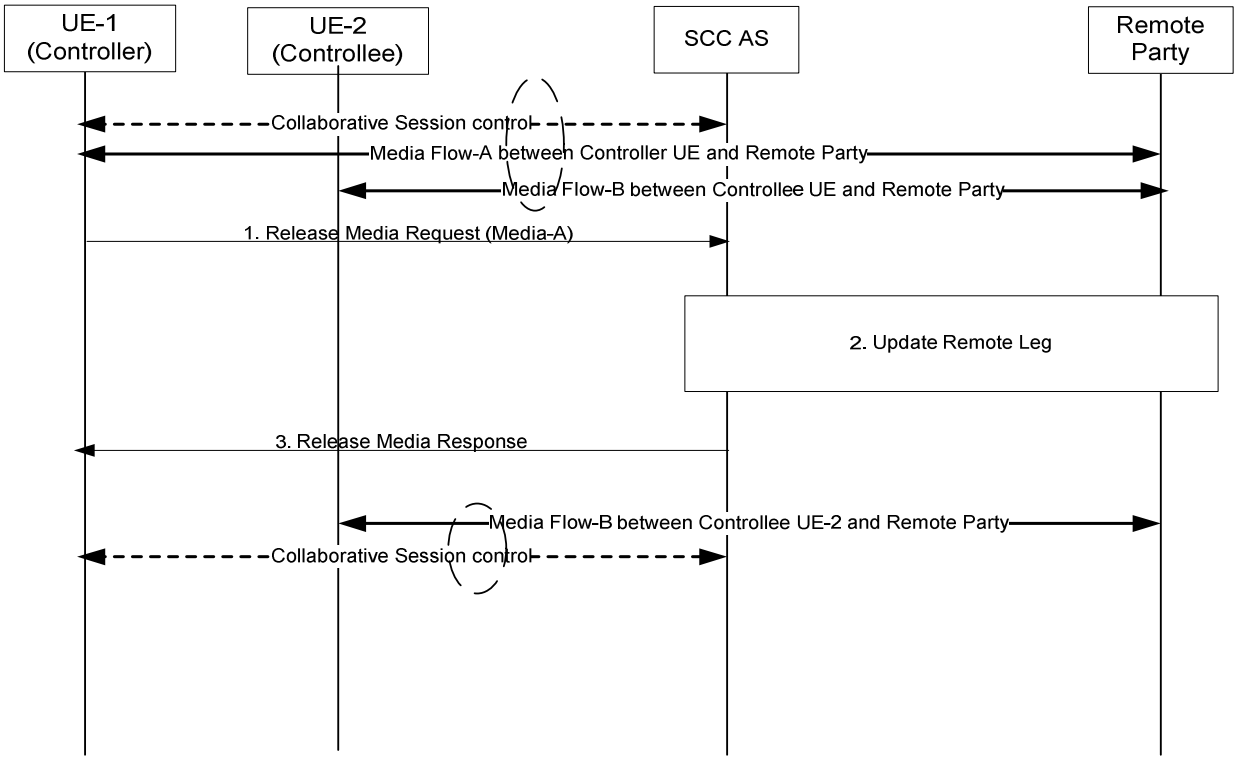

Figure 6a.4.3-1: Controller UE Initiated Media release – media on Controller UE

1. UE-1 sends a Release Media request to the SCC AS to remove Media-A from the Collaborative Session. The IUT media release request shall include enough information for the SCC AS to:

   - identify that the media is Media Flow-A;
   - identify that the released media is on UE-1;
   - keep the control of Collaborative Session in UE-1.

2. The SCC AS updates the Remote Leg with media flow –A removed.
3. The SCC AS sends release media response to UE-1. UE-1 releases media flow – A at its end.

The Collaborative Session continues to exist after the procedure is complete.

6a.4.4 Controller UE Initiated Release Media (media flow on the Controllee UE)

The information flow shows the Controller UE releasing a media flow from a Controllee UE. As a pre-requisite, there exists a Collaborative Session with two media flows, flow–A on the Controller UE (UE-1) and Flow–B on the Controllee UE (UE-2).

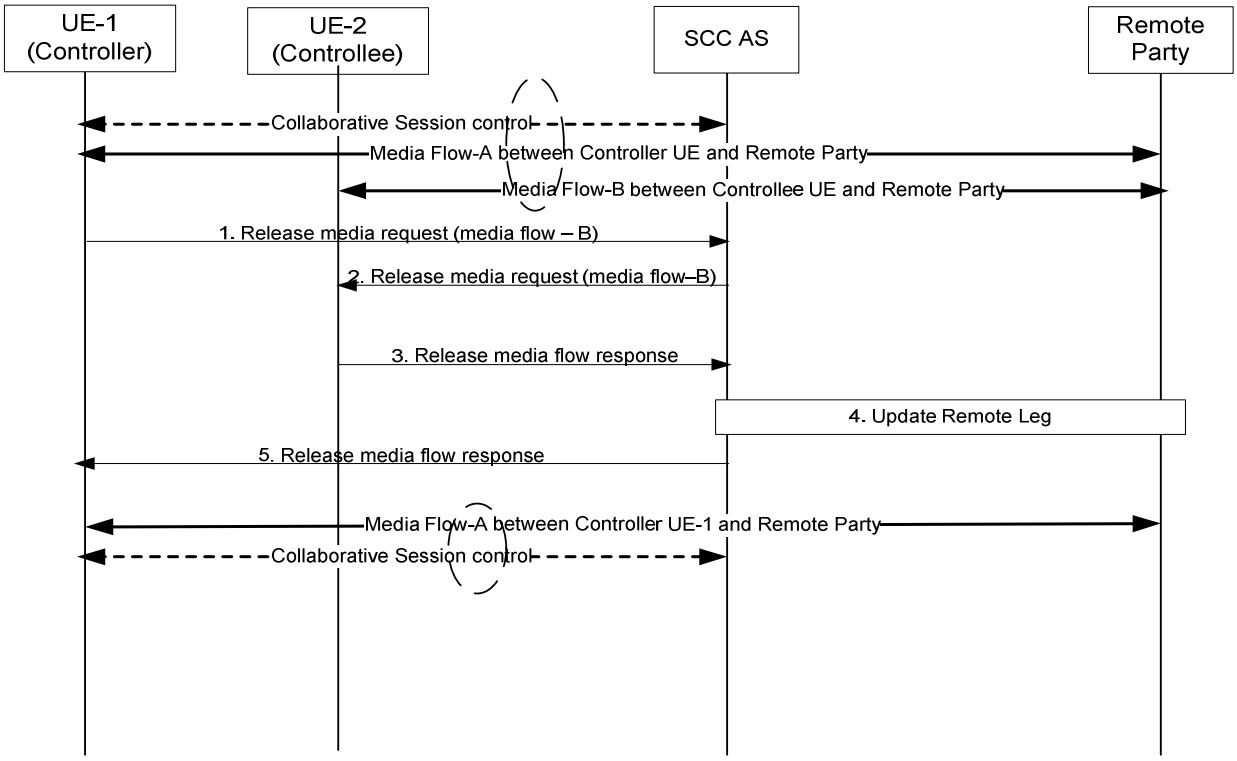

Figure 6a.4.4-1: Controller UE Initiated Media release – media flow on Controllee UE

1. UE-1 sends a Release Media request to the SCC AS to remove Media-A from the Collaborative Session. The request includes the information pertaining to media flow -B:

   - identify that the released media is Media Flow-B;
   - identify that the released media is on UE-2;
   - keep the control of Collaborative Session in UE-1.

2. The SCC identifies media flow B as associated with UE-2 (controlee UE) and sends the Release Media Request to UE-2. The request identifies the media flow–B that needs to be removed and the media flow is removed. If no more media flows remain on UE-2 that are participating in the Collaborative Session, the SCC AS releases the access leg from UE-2.

3. UE-2 sends back Release Media response back to SCC AS.

4. The SCC AS updates the Remote Leg with media flow–B removed.

Step 2 and step 4 may be executed in any order.

5. The SCC AS sends release media response to UE-1.

If UE-2 has left the Collaborative Session at step 2 and no other Controllee UE remain in this Collaborative Session, this Collaborative Session becomes a normal IMS session.

6a.4.5 Controllee UE initiated release media on itself

As per standard IMS UE behaviour, a Controllee UE may initiate a release of a media flow that it terminates. In this case, this media release on the access leg is notified to the Controller UE, which may decide to transfer this media flow to another UE under the same subscription, or to remove it from the Collaborative Session (i.e. remove it on the remote leg).

The following information flow shows a Controllee UE initiating the release of a media flow that it terminates, and Controller UE being informed of this release by the SCC AS. As a pre-requisite, there exists a Collaborative Session of which UE-1 is the Controller UE and UE-2 is a Controllee UE terminating a media flow, Media Flow A. There may be

other media flows (on UE 1, UE-2 or other UEs) within the Collaborative Session; such media flows and UEs are not shown on this information flow; they shall not be impacted by this operation.

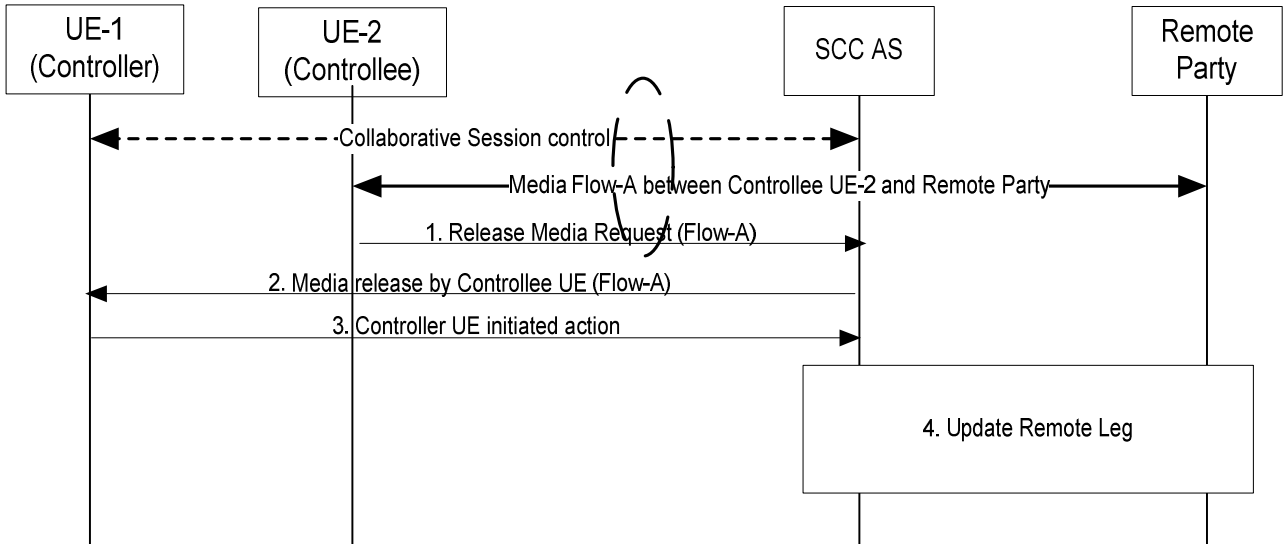

Figure 6a.4.5-1: Controllee UE initiated release media flow on itself

1. Controllee UE-2 sends a request to release Media Flow A (that it terminates), using standard IMS procedure.
2. The SCC AS identifies that Media Flow A is under Collaborative Session control of UE-1. The SCC AS indicates to Controller UE-1 that Controllee UE-2 has released Media Flow A.
3. Controller UE-1 initiates one of the following procedures, in order to transfer Media Flow A to another UE under the same subscription, or to remove it from the Collaborative Session:
   - Controller UE initiated media transfer from Controllee UE to Controller UE, specified in clause 6a.3.2;
   - Controller UE initiated media transfer from Controllee UE to another Controllee UE, specified in clause 6a.3.3;
   - Controller UE initiated release media (media flow on the Controllee UE), specified in clause 6a.4.3;
   - Controller UE initiated release Collaborative Session, specified in clause 6a.5.1.
4. The SCC AS updates the Remote Leg while executing the procedure initiated by Controller UE-1 at step 3.

6a.4.6 Controllee UE initiated modify media on itself

As per standard IMS UE behaviour, a Controllee UE may initiate a modification of a media flow that it terminates.

The following information flow shows a Controllee UE initiating the modification of a media flow that it terminates. As a pre-requisite, there exists a Collaborative Session of which UE-1 is the Controller UE and UE-2 is a Controllee UE terminating a media flow, Media Flow A. There may be other media flows (on UE-1, UE-2 or other UEs) within the Collaborative Session; such media flows and UEs are not shown on this information flow; they shall not be impacted by this operation.

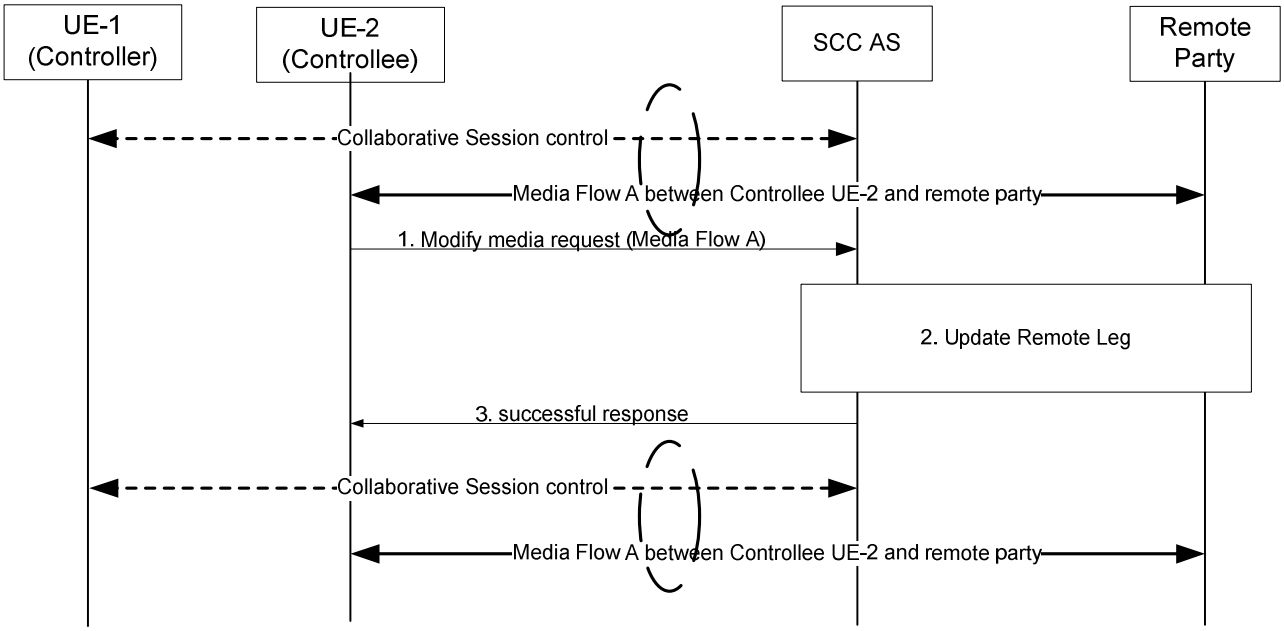

Figure 6a.4.6-1: Controllee UE initiated modify media flow on itself

1. Controllee UE-2 sends a request to modify the characteristics of Media Flow-A (that it terminates), using standard IMS procedure.
2. The SCC AS updates the Remote Leg for allowed media changes, providing the new media flow characteristics from UE-2.
3. The SCC AS sends a successful response to the request sent by UE-2 at step 1.

6a.4.7 Remote party initiated add new media

The following is an example of an information flow where remote party wants to modify an existing session with UE-1 to add Media Flow-B. In this information flow, UE-1 and UE-2 belong to the same user subscription. UE-1 is the Controller UE and UE-2 is a Controllee UE. If UE-2 is not involved in the Collaborative Session controlled by UE-1 before the media addition, there is at least another Controllee UE involved in the Collaborative Session before the media addition which is not shown in the information flow.

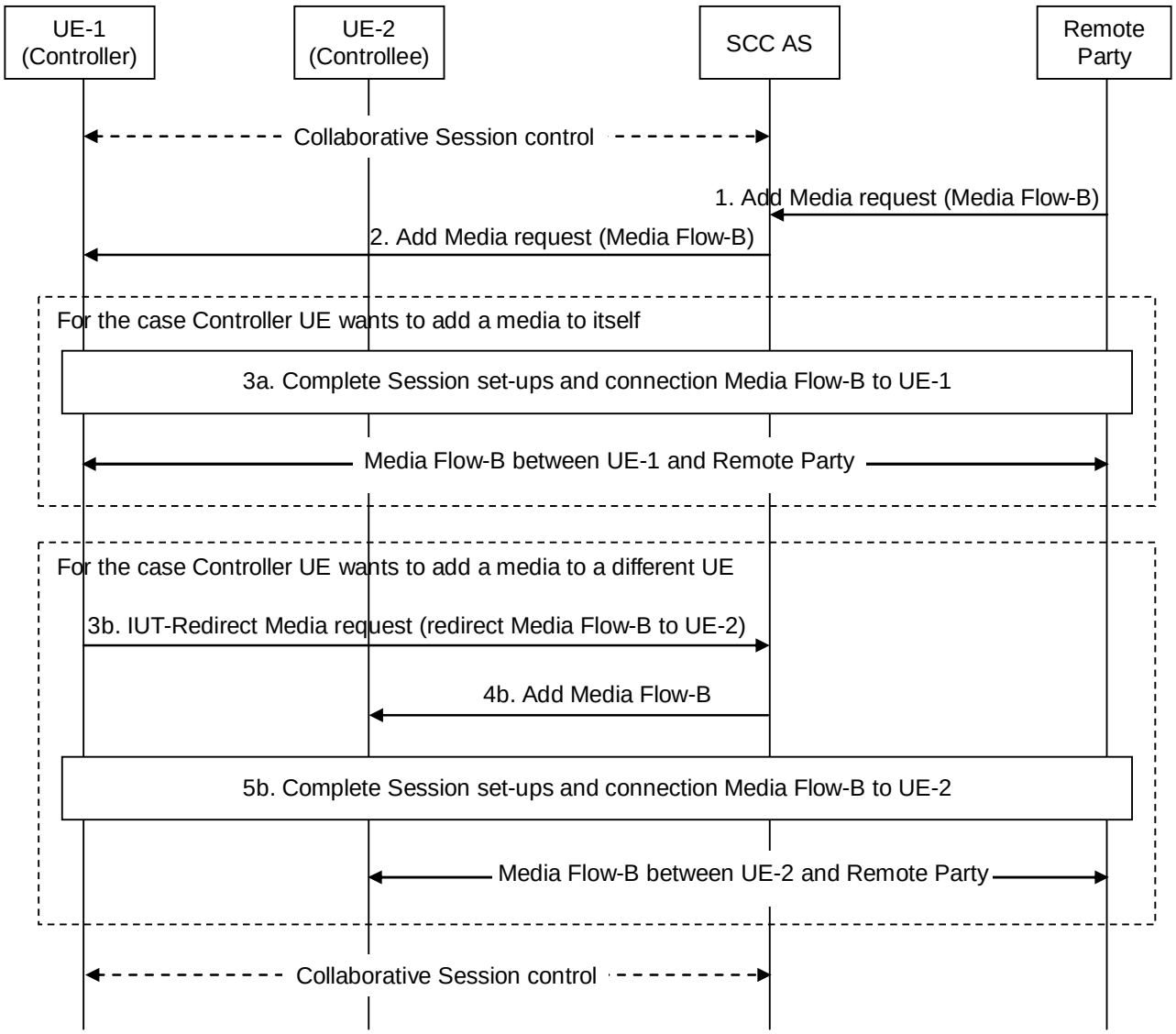

Figure 6a.4.7-1: Remote party initiated add new media

1. Remote party sends an Add Media request to add Media Flow-B to an existing session between UE-1 and remote party as per TS 23.228 [4].

2. SCC AS forwards the Add Media request to UE-1 according to the procedures defined in TS 23.228 [4].

Step 3a is for the case Controller UE wants to add Media Flow-B to itself.

3a. The session setup is completed. The new Media Flow-B will after this be established between UE-1 and remote party, and be involved in the Collaborative Session controlled by UE-1.

Steps 3b and 5b are for the case Controller UE wants to add Media Flow-B to a different UE while retaining control for the added media.

3b. Controller UE-1 sends an IUT-Redirect-Media request to SCC AS. The IUT-Redirect-Media request needs to include at least the following information:

- identify that Media Flow-B needs to be redirected to UE-2.

4b. SCC AS sends an Add Media Flow-B to UE-2.

5b. The session setup is completed. When the add media operation is completed, there is Media Flow-B between UE-2 and remote party. There is a Collaborative Session established between UE-1 and UE-2. The Media-B is controlled by UE-1.

NOTE 1: If UE-2 was not involved in the Collaborative Session controlled by UE-1 before the media addition, UE-2 becomes a Controllee UE when the media addition is completed.

NOTE 2: If remote party wants to add more than one media flows to an existing session, these media flows can be distributed to several different UEs by repeating the above steps 3b-5b.

6a.4.8 Remote party initiated release media

The following is an example of an information flow where remote party wants to remove one of media flows, Media Flow-B from an ongoing session. In this information flow, UE-1 and UE-2 belong to the same user subscription. UE-1 is a Controller UE and UE-2 is a Controllee UE.

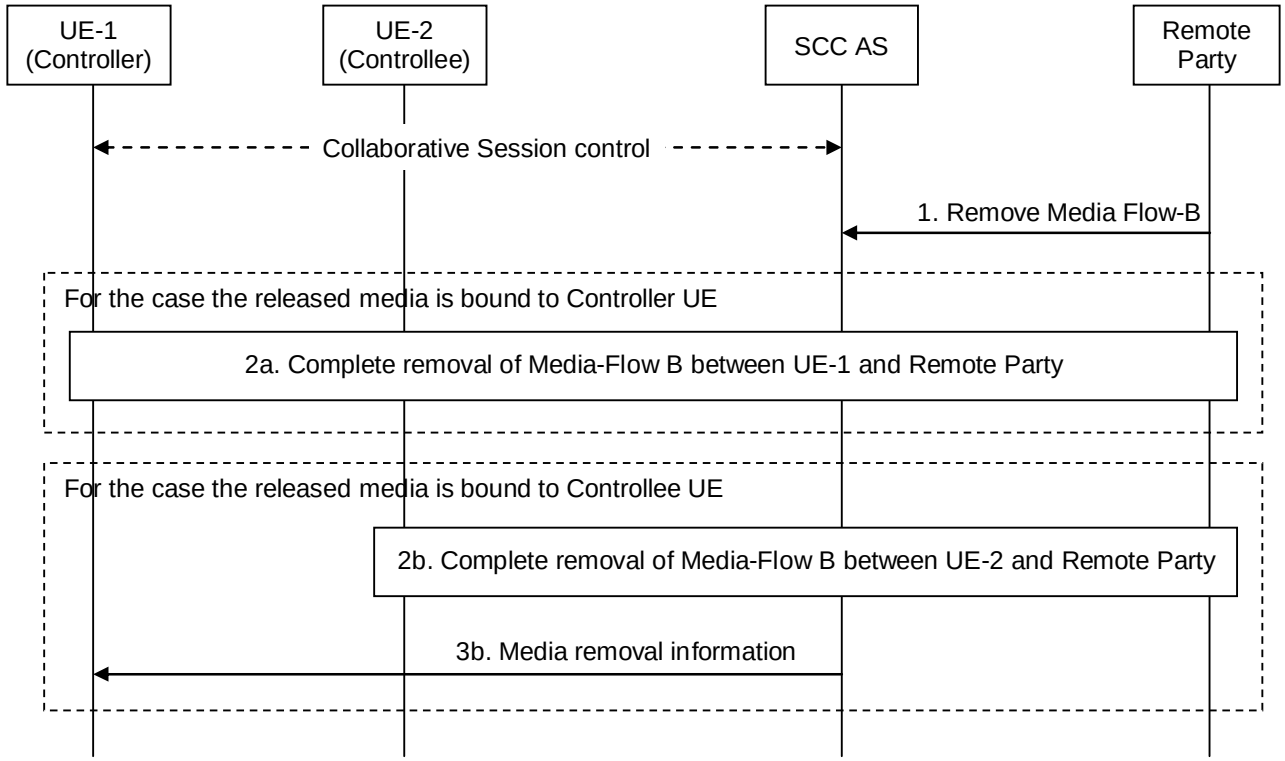

Figure 6a.4.8-1: Remote party initiated release media

1. Remote party uses standard IMS procedures defined in TS 23.228 [4] to remove Media Flow-B from the session.

Step 2a is for the case the released media is bound to Controller UE.

2a. The removal of Media Flow-B between Controller UE-1 and remote party is completed.

Steps 2b and 3b are for the case the released media is bound to Controllee UE.

2b. The removal of Media Flow-B between Controllee UE-2 and remote party is completed.

NOTE 1: If no more media remains on the Access Leg between SCC AS and Controllee UE-2, this Access Leg is released and Controllee UE-2 will no longer be part of the Collaborative Session.

3b. SCC AS informs Controller UE-1 that the Media Flow-B on UE-2 was removed.

NOTE 2: If no more Controllee UE remains after the media removal, the Collaborative Session is terminated and there will be a general IMS session between UE-1 and remote party.

6a.4.9 Remote party initiated media modification

A Collaborative Session is already established using procedures shown in clause 6a.2. The following is an example of an information flow where remote party wants to modify one of media flows, Media Flow-B from an ongoing session. In this information flow, UE-1 and UE-2 belong to the same user subscription. UE-1 is a Controller UE and UE-2 is a Controllee UE.

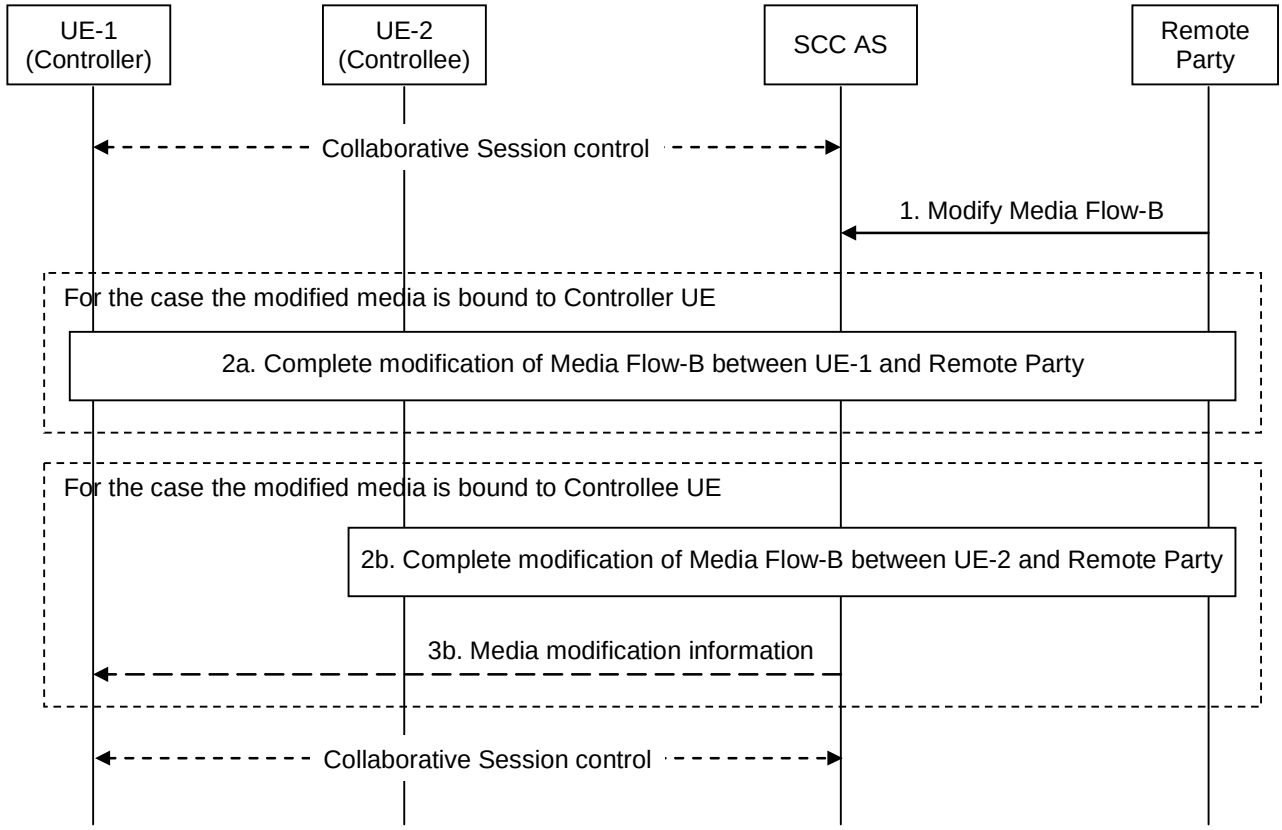

Figure 6a.4.9-1: Remote party initiated media modification

1. Remote party uses standard IMS procedures defined in TS 23.228 [4] to modify Media Flow-B from the session.

Step 2a is for the case the modified media is bound to Controller UE.

2a. The modification of Media Flow-B between Controller UE-1 and remote party is completed.

Steps 2b – 3b are for the case the modified media is bound to Controllee UE.

2b. The modification of Media Flow-B between Controllee UE-2 and remote party is completed.

3b. If the media modification is hold or resume, SCC AS informs Controller UE-1 that the Media Flow-B on UE-2 was modified.

6a.5 Collaborative Session release

6a.5.1 Controller UE Initiated Release Collaborative Session

The following information flow shows the Controller UE releasing a Collaborative Session to release all the media flows with remote party. As a pre-requisite, there exists a Collaborative Session with two media flows, Media Flow–A on the Controller UE (UE-1) and Media Flow–B on the Controllee UE (UE-2).

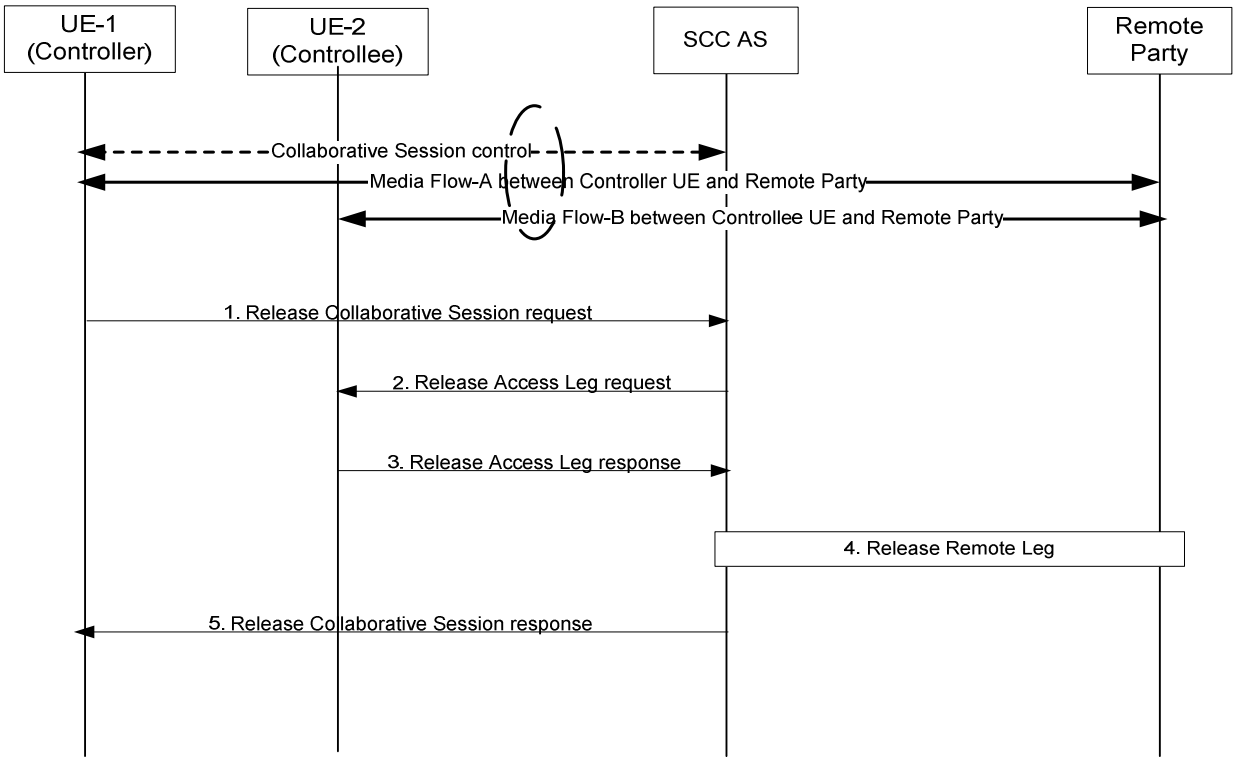

Figure 6a.5.1-1: Controller UE initiated Collaborative Session release

1. UE-1 sends a Release Collaborative Session request to the SCC AS to release the Collaborative Session and to release the Media Flow-B on UE-2: UE-1 removes Media Flow-A that is participating in the Collaborative Session.

2. The SCC AS identifies the Collaborative Session and the participating Access Leg from Controllee UE. SCC AS sends the Release Access Leg request to UE-2. The request identifies the Access Leg that needs to be released.

3. UE-2 releases the Access Leg and sends back Release Access Leg response to SCC AS.

4. The SCC AS releases the Remote Leg using IMS session release procedure as specified in TS 23.228 [4].

5. The SCC AS sends Release Collaborative Session response to UE-1.

6a.5.2 Remote Party Initiated Release Collaborative Session

The following shows the information flow where the remote party initiates the release of the session, which causes the SCC-AS to release the Collaborative Session.

UE-1 is a Controller UE and the other UEs are Controllee UEs.

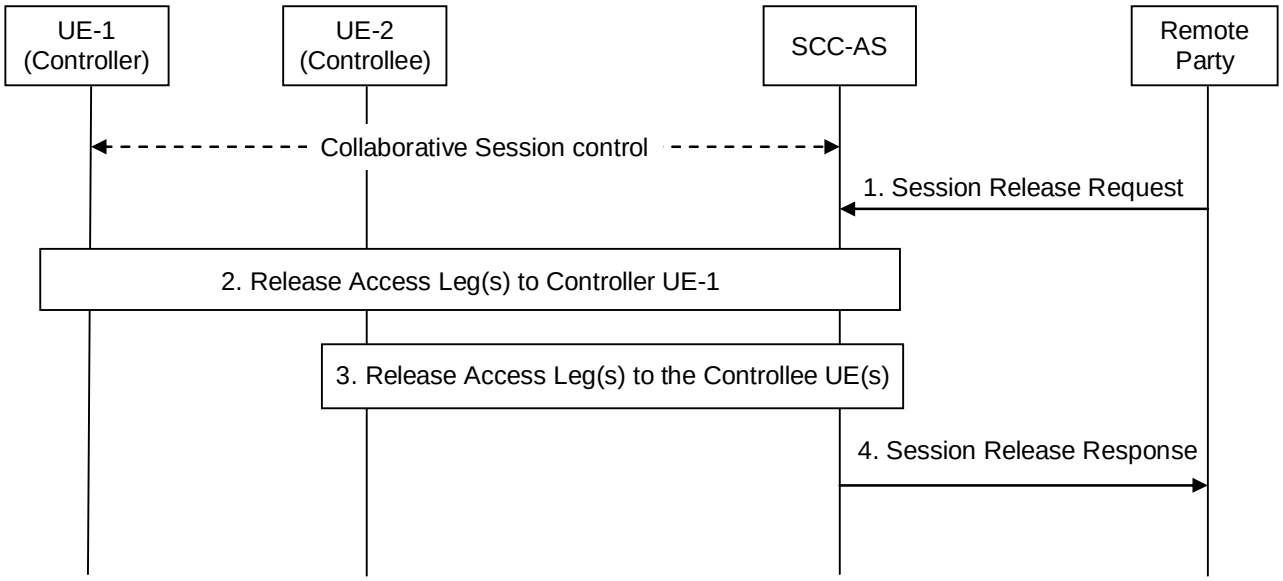

Figure 6a.5.2-1: Remote Party Initiated Release Collaborative Session

1. The Remote Party decides to release the session, and therefore a Session Release Request is sent by the remote party to the SCC-AS.
2. The SCC-AS releases the Access Leg(s) towards the Controller UE-1.
3. The SCC-AS releases the Access Leg(s) towards the different Controllee UEs. This occurs in parallel with step 2.
4. When all Access Legs that belonged to the Collaborative Session have been released, the SCC-AS responds to the remote party.

6a.6 Inter-UE Transfer without establishing a Collaborative Session

UE-1 and UE-2 are under the same user subscription and share the same service profile. UE-1 is involved in IMS session with remote party. The information flow in Figure 6a.6-1 shows transfer of the session from UE-1 to UE-2. Since the entire session is transferred simultaneously, the roles of the Controller UE and Controllee UE are not applicable.

NOTE 1: This signalling flow does not require the UE-2 to have IUT capabilities.

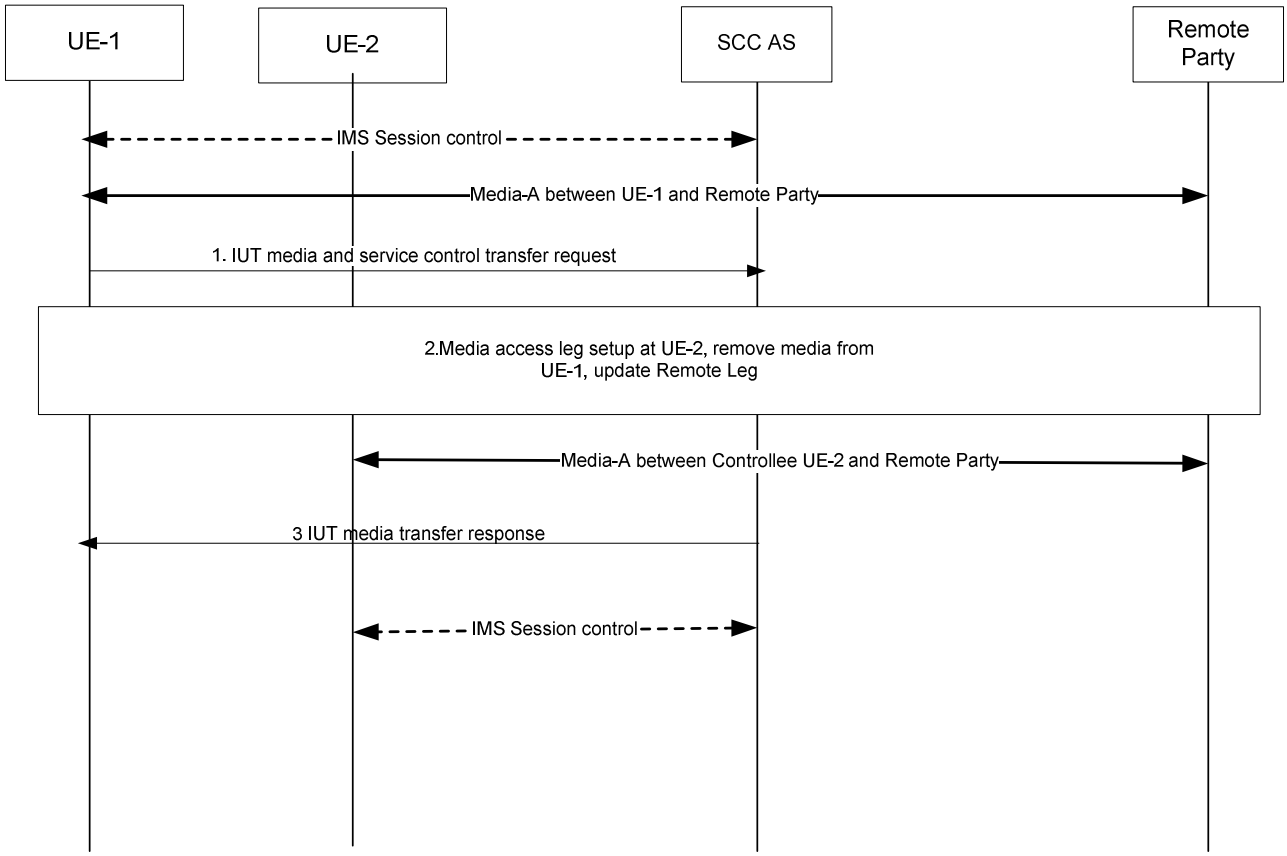

Figure 6a.6-1: Inter-UE transfer without establishing Collaborative Session

1. UE-1 sends IUT media and service control transfer request to the SCC AS to transfer the session that includes Media-A from UE-1 to UE-2. The IUT media and service control transfer request shall include enough information for the network to:

   - identify the transferred session;
   - identify that the target of the transferred session is UE-2;
   - identify the access leg of UE-1 to be transferred to UE-2.

2. The SCC AS initiates the media session setup procedure with UE-2 for the Media-A, and updates the Remote Party.

3. The SCC AS releases the session with UE-1.

When the above transfer is completed the SCC AS retains the service state (e.g. media flows status) of UE-2, and the UE-2 has the control of the IMS session.

NOTE 2: If, besides the Media-A, there are other media flows in an unrelated session between UE-1 and Remote Party, the other media flows are not impacted by the above session transfer operation.

NOTE 3: The set of Application Servers and services that are invoked for the overall session with the remote end is determined by the service profile of UE-1 and is not changed during this procedure. If UE-2 was under a different service profile than UE-1 (contrarily to what is assumed), this procedure would lead to a situation where UE-2 is involved in an IMS session for which the Application Servers and services that are invoked are those of the wrong service profile. This Release does not provide a solution to prevent this.

6a.7 Execution of supplementary services

6a.7.1 General

Even though the media components for the Collaborative Session are split onto multiple Access Legs of different UEs, the remote end is presented with one session including all the media components. This section describes the SCC AS and IUT UE procedures for handling supplementary services as described in TS 22.173 [15].

Within a Collaborative Session, the Controllee UEs can be under a different service profile than the Controller UE. The service profile of the Controller UE shall determine the set of Application Servers and services that are invoked for the overall session with the remote end.

For a Controllee UE's Access Leg where CS media is used, the interaction described in the following sections still apply. However, the operations on the CS media follow the procedures as described in TS 23.292 [5].

6a.7.2 Originating Identification Presentation (OIP)

The OIP service is not impacted by IUT.

6a.7.3 Originating Identification Restriction (OIR)

The OIR service is not impacted by IUT.

6a.7.4 Terminating Identification Presentation (TIP)

The TIP service is not impacted by IUT.

6a.7.5 Terminating Identification Restriction (TIR)

The TIR service is not impacted by IUT.

6a.7.6 Communication Diversion (CDIV)

The CDIV service is not impacted by IUT.

6a.7.7 Communication Hold (HOLD)

If the Controller UE wants to invoke the HOLD service on one or more media component(s), the Controller UE shall invoke the HOLD procedures, as defined in TS 24.610 [16]. The SCC AS shall act on the HOLD requests by updating all the Controllee UEs whose media status are changed and shall update the remote Access Leg using the procedures defined in TS 24.610 [16].

6a.7.7.1 Controller UE invoking the HOLD service on the media flow on a Controllee UE

The information flow shows a Controller UE invoking the HOLD service on the media flow that is originated from the Controllee UE. As a pre-requisite, there exists a Collaborative Session with two media flows, Media Flow–A on the Controller UE (UE-1) and Media Flow–B on the Controllee UE (UE-2). Only supplementary service execution for hold and resume is allowed for Controller UE on the media flow that is originated from the Controllee UE.

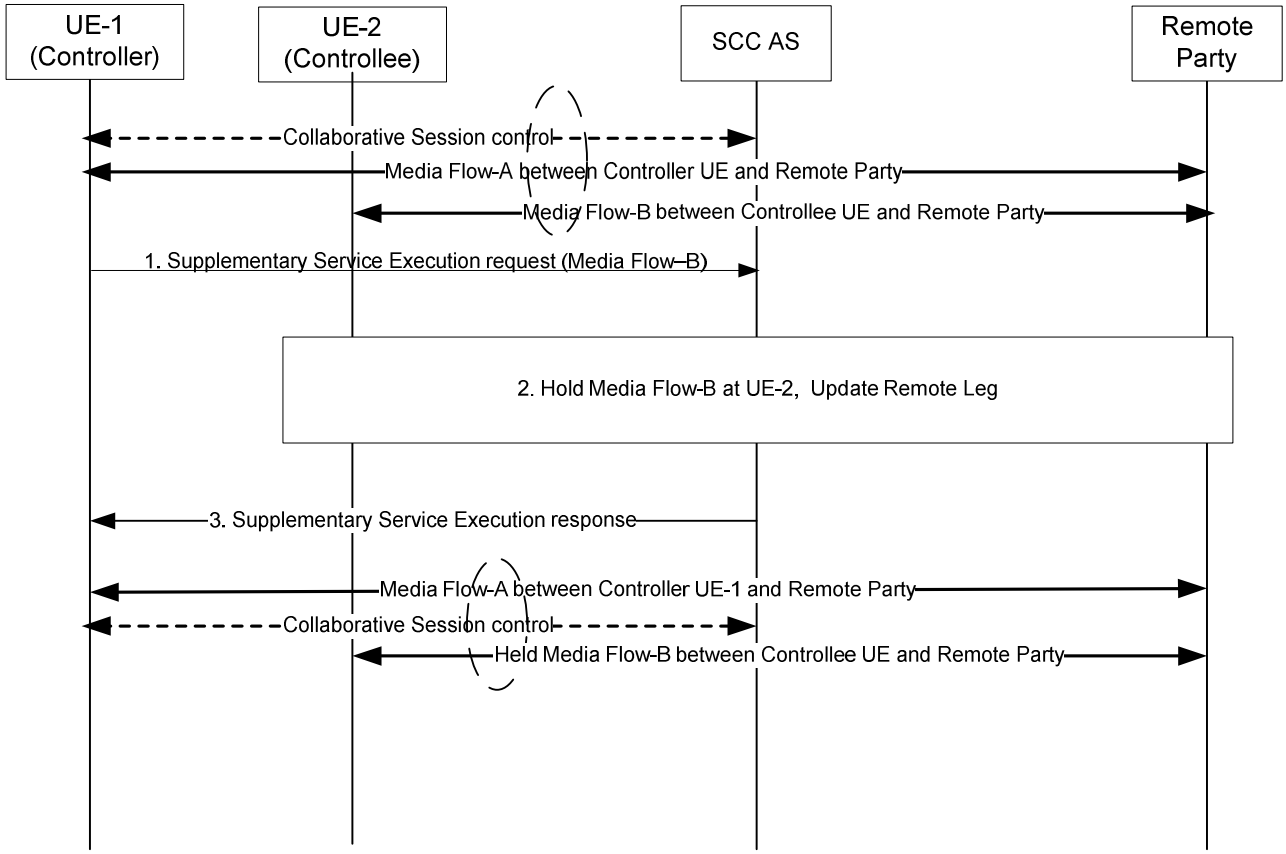

Figure 6a.7.7.1-1: Controller UE invoking the HOLD service on the media flow on a Controllee UE

1. UE-1 sends a Supplementary Service Execution request to invoke the HOLD service on Media Flow-B on UE-2. The IUT supplementary service execution request shall include enough information for the SCC AS to:

   - identify that the media to be held is Media Flow-B;

   - identify that the media to be held is on UE-2;

   - identify that the supplementary service to be executed on Media Flow-B is the HOLD service.

2. The SCC identifies Media Flow-B as associated with UE-2 and sends the Supplementary Service Execution request to UE-2. The request identifies the Media Flow–B that needs to be held.UE-2 holds the Media Flow-B. The SCC AS updates the Remote Leg with Media Flow–B held.

3. The SCC AS sends a Supplementary Service Execution response to UE-1.

6a.7.8 Communication Barring (CB)

The CB service is not impacted by IUT.

6a.7.9 Message Waiting Indication (MWI)

The MWI service is not impacted by IUT.

6a.7.10 Conference (CONF)

Only the Controller UE can invoke the CONF service for the Collaborative Session and it shall follow the procedures as defined in TS 24.605 [17] for any CONF service related operations.

When the remote end sends a request for the CONF service to replace an existing session, the SCC AS shall deliver the request for CONF service to the Controller UE, which then sets up new session following the procedures defined in TS 24.605 [17].

6a.7.11 Explicit Communication Transfer (ECT)

Only the Controller UE can invoke the ECT service on behalf of the Collaborative Session and it shall follow the procedures as specified in TS 24.629 [18]. 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 an ECT transfer request from the remote end to transfer the Collaborative Session, the SCC AS shall deliver the request to the Controller UE.

Upon receiving an ECT transfer request to transfer the Collaborative Session, the Controller UE shall establish a new session towards the transfer target following the procedures defined in TS 24.629 [18].

6a.7.12 Advice of Charge (AOC)

When the AOC service specified in TS 24.647 [19] is active, the SCC AS shall deliver charging information during the communication to the Controller UE.

6a.7.13 Closed User Groups (CUG)

The CUG service is not impacted by IUT.

6a.7.14 Three-Party (3PTY)

The 3PTY service in TS 24.605 [17] is considered as a special case of CONF service and the interaction with IUT is the same as that specified in clause 4.8.10 for CONF service.

6a.7.15 Flexible Alerting (FA)

The FA service is not impacted by IUT.

6a.7.16 Communication Waiting (CW)

The CW service is not impacted.

6a.7.17 Completion of Communications to Busy Subscriber (CCBS)/Completion of Communications by No Reply (CCNR)

The CCBS/CCNR service is not impacted.

6a.7.18 Customized Alerting Tones (CAT)

The CAT service is not impacted.

6a.7.19 Malicious Communication IDentification (MCID)

The MCID service is not impacted by IUT.

6a.7.20 Reverse Charging

The Reverse Charging service is not impacted by IUT.

6a.7.21 Personal Network Management (PNM)

The PNM service is not impacted by IUT.

6a.7.22 Customized Ringing Signal (CRS)

The CRS service is not impacted by IUT.

6a.8 IUT target discovery

6a.8.1 General

When initiating Inter-UE transfer procedures, the UE may use the following information:

- other UEs belonging to the same IMS subscription;
- the availability (e.g. online, offline etc) of the UEs;
- the capabilities (e.g. support of audio/video formats etc) of the UEs.

determination of UEs belonging to the same IMS subscription is based on either or both of static list stored in the UE and based on IMS registration. When based on IMS registration, the UE gets notified when other UEs under the same Implicit Registration Set become available and their capabilities and contact details. The static list, which contains a list of eligible UEs for Inter-UE Transfer, can be created manually by the user.

The availability and capabilities of the target UE(s) can be determined by the information flow described in the subsequent section.

6a.8.2 Information flow for IUT target availability and capabilities discovery

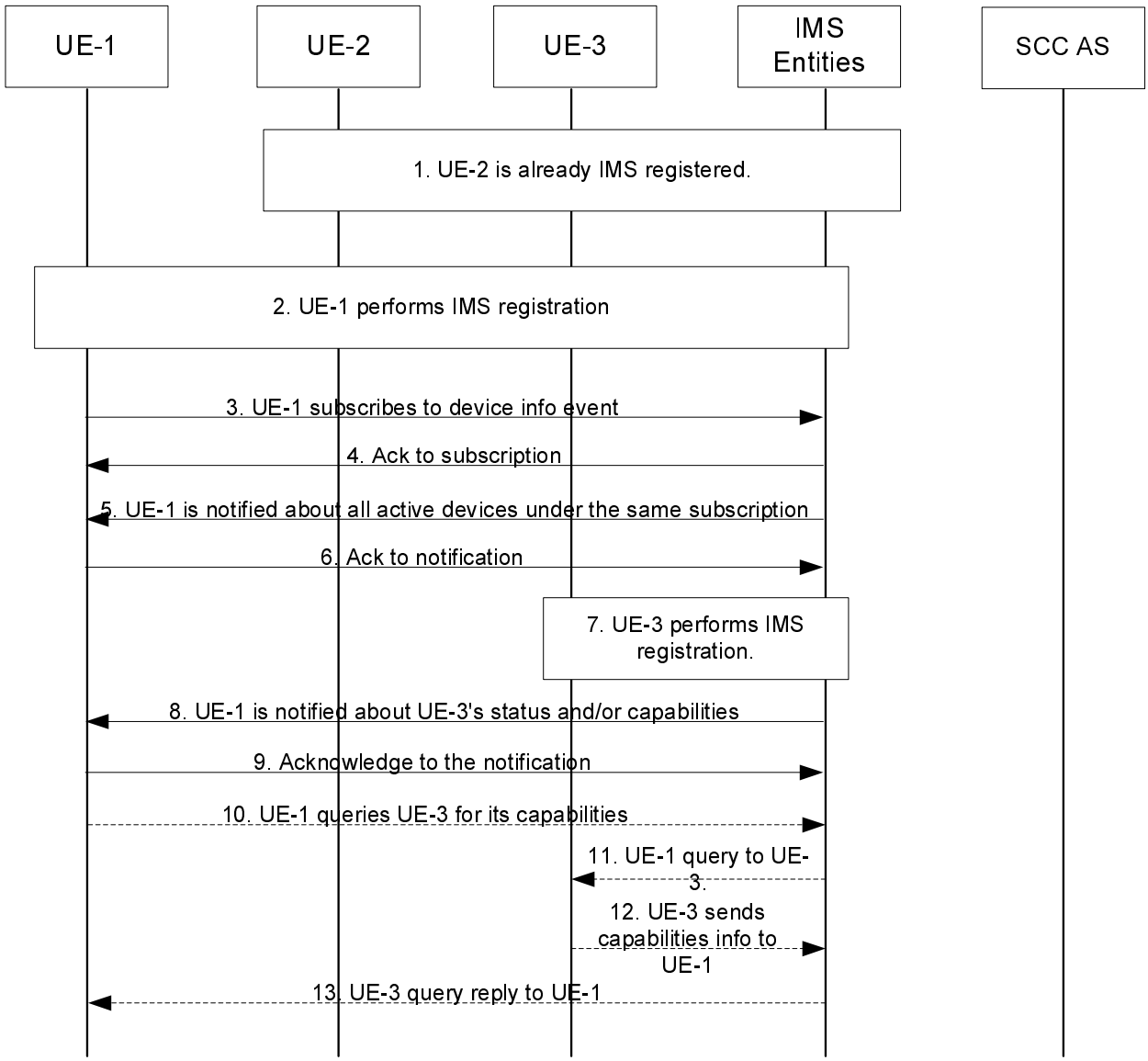

Figure 6a.8.2-1 Inter-UE Transfer target discovery based on IMS registration

1. UE-2 is IMS registered following the procedures defined in TS 23.228 [4].

2. UE-1 performs IMS registration following the procedures defined in TS 23.228 [4].

3 ~ 4. UE-1 is interested to discover the status and capabilities of other devices under the same subscription. It subscribes to an event package (e.g., reg-event, presence) for registration information and the capabilities information.

5 ~ 6. The IMS CN subsystem or presence AS notifies UE-1 of other devices (e.g. UE-2) status and, if available, capabilities information.

7. UE-3 performs IMS registration.

8 ~ 9. The IMS CN subsystem notifies UE-1 of UE-3's availability and, if available, capabilities information.

Optionally, if sufficient UE capabilities information is not included in step 8, then the following steps can be performed:

10 ~ 13. Among all the available devices, UE 1 is interested in performing Inter-UE transfer to UE-3. UE-1 performs capability query towards UE-3.

6b Void

6c Procedures and flows for SRVCC Emergency Session

6c.1 IMS Emergency origination flow

Figure 6c.1-1 provides flow for an emergency session established in IMS, illustrating how the emergency session is anchored in the EATF.

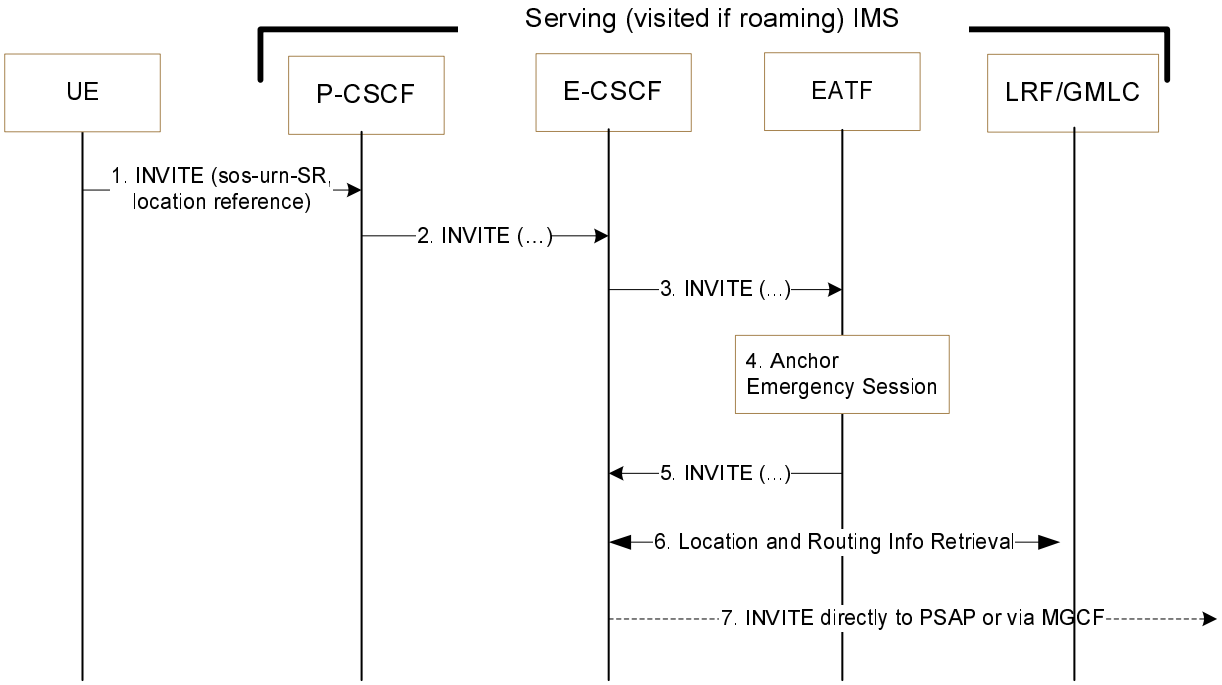

Figure 6c.1-1: UE initiating an emergency session in IMS

1. The UE initiates an IMS emergency session over EPS or GPRS and the procedures defined in TS 23.167 [23]. This involves the UE generating a SIP INVITE containing the UE's location information and the equipment identifier.

2. The P-CSCF selects an E-CSCF and forwards the INVITE to the E-CSCF.

3. The E-CSCF sends the INVITE to the EATF.

4. The EATF (acting as a routing B2BUA) anchors the emergency session, i.e. the EATF is inserted in the signalling path which invokes a 3pcc for enablement of Access Transfers for the call as specified in clause 6.3.1.3.

5. The EATF creates a new INVITE and sends it back to E-CSCF.

6. For this optional procedure, refer to TS 23.167 [23].

7. The E-CSCF uses the routing information to format the INVITE message, and it sends it directly to the PSAP, or to the PSAP via the MGCF.

6c.2 SRVCC session transfer of IMS emergency session

Figure 6c.2-1 provides flow for SRVCC for IMS emergency session.

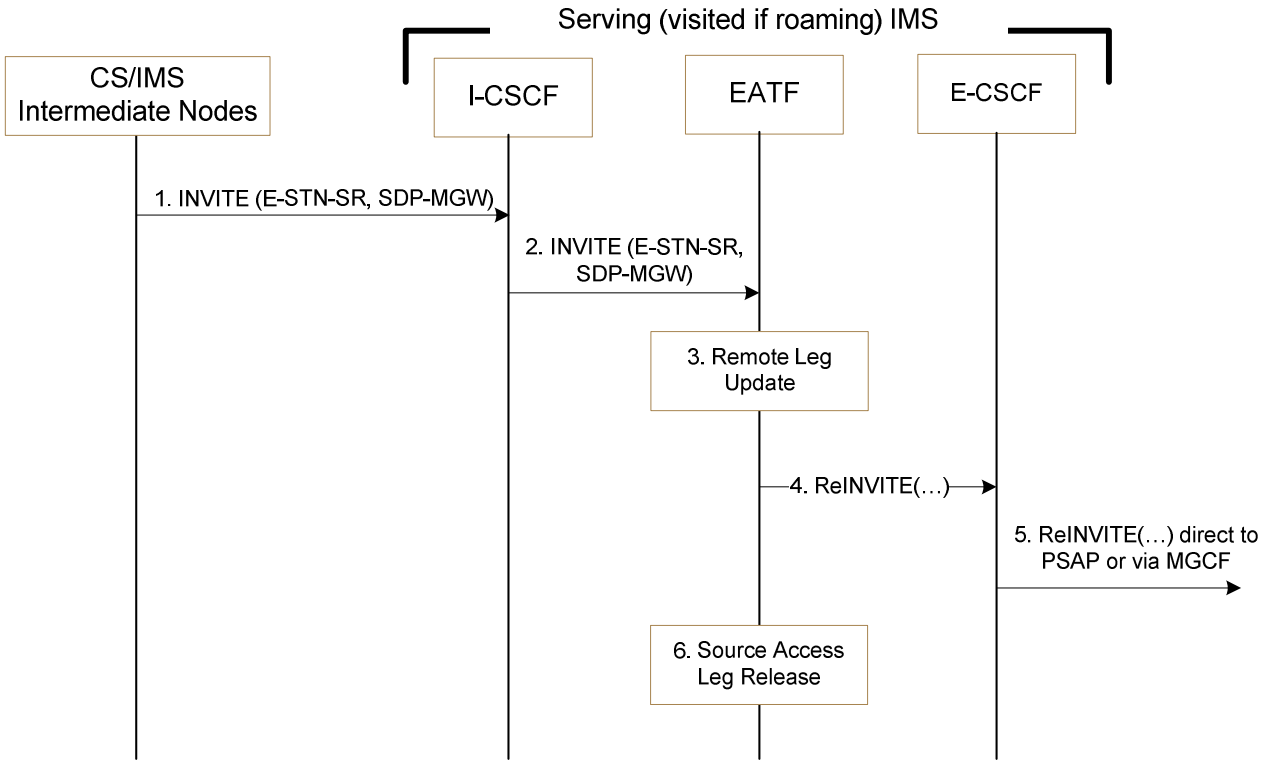

Figure 6c.2-1: IMS level Call flow for SRVCC for IMS emergency session with E-STN-SR

1. MSC Server initiates the session transfer with the E-STN-SR and it includes the equipment identifier.

2. The I-CSCF routes the INVITE directly to the EATF via I5 by using similar procedures to that defined in TS 23.228 [4] for PSI based Application Server termination.

NOTE: The use of indirect routeing for PSI based Application Server Termination as described in TS 23.228 [4] in clause 5.7.6 cannot be used for routing the INVITE to the EATF.

3 - 4. The EATF uses the E-STN-SR to determine that Access Transfer is requested. The EATF proceeds with the Access Transfer of the active session with bi-directional speech for the UE by updating the Remote Leg with the media description and other information using the Remote Leg Update procedure as specified in clause 6.3.1.5.

5. The E-CSCF forwards the Re-INVITE to the MGCF associated with the PSAP if the PSAP is located in the PSTN or CS Domain (the u-plane path is switched between the UE and the MGW) or the Re-INVITE is sent directly to an IP-capable PSAP (the u-plane path between the UE and the PSAP is switched end-to-end).

6. When session modification procedures complete, the source access leg (i.e. the access leg previously established over IMS) is released as specified in clause 6.3.1.6.

6c.3 SRVCC Support for UEs in Normal Mode

If the MSC enhanced for SRVCC has a SIP interface, it shall use the mechanism specified in TS 24.229 [26] additionally to carry the equipment identifier to the EATF.

If the MSC enhanced for SRVCC does not have a SIP interface, it shall convey the equipment identifier by using the IAM message to the MGCF. The MGCF shall use the mechanism specified in TS 24.229 [26] additionally to carry the equipment identifier to the EATF.

The EATF can then correlate the call legs according to the equipment identifier.

NOTE: The method for correlation of the call legs at the EATF if SIP or ISUP does not provide this information is implementation and configuration dependant.

6c.4 SRVCC Support for UEs in Limited Service Mode

To support SRVCC procedure for UEs in Limited Service Mode, the MSC enhanced for SRVCC will setup the call leg towards the EATF with the UE's equipment identifier.

If the MSC enhanced for SRVCC has a SIP interface, it shall use the mechanism specified in TS 24.229 [26] to carry equipment identifier as a SIP URI to the EATF.

If the MSC enhanced for SRVCC does not have a SIP interface, it shall convey the equipment identifier by using the IAM message to the MGCF. The MGCF shall use the mechanism specified in TS 24.229 [26] to carry equipment identifier as a SIP URI to the EATF.

The EATF can then correlate the call legs according to the equipment identifier.

NOTE: The method for correlation of the call legs at the EATF if SIP or ISUP does not provide this information is implementation dependant.

7 Security

7.1 General

There are no impacts on existing security mechanisms for the CS Domain or for IMS as a result of Session Transfers.

7.2 Access security for CS Domain

TS 33.102 [11] describes the Security Architecture for GSM and UMTS subscribers, SC places no additional requirements upon the CS domain security than those already in the detailed access specific specification e.g., above those described in TS 33.102 [11].

7.3 Access security for IMS

TS 33.203 [12] specifies the security features and mechanisms for secure access to the IM subsystem (IMS). SC places no additional requirements upon the IMS above those described in TS 33.203 [12].

8 Charging

8.1 Charging strategy

To ensure the completeness and correctness of charging during Session Transfer procedure, and to avoid possible double billing in IMS and CS, the following strategy should be applied:

- Provide cohesive charging records with a complete service continuity history for the whole duration of a SC subscriber multimedia session by the SCC AS.
- For cases of CS origination and CS termination, correlate the charging records generated in CS and IMS for the subscriber multimedia session, to avoid double billing to the subscriber.
- Treat the charging records generated in the transferring-in access network for the call(s)/session(s) established during the Session Transfer as subsequent Access Legs, and therefore do not impact the direction of the initial call(s)/session(s) for the purpose of charging.

- Keep the start of charging in the transferring-in access network align with the stop of charging in the transferring-out access network, to avoid double billing to the subscriber during the Session Transfer.

To avoid online charging correlation in IMS and CS domain, the SC online charging should be performed only in IMS, i.e. prepaid service logic in CS domain should not be invoked for anchored CS origination/termination call and subsequent CS origination call established for performing Session Transfer. In addition, the SCC AS should report information related to the initial multimedia session establishment as well as the information related to the Session Transfer procedure to OCS for correct credit control purpose.

8.2 Accounting strategy

To assist in performing the settlement between operators, the following strategy shall be applied:

- Provide cohesive charging records with a complete service continuity history for the whole duration of a SC subscriber multimedia session by the SCC AS.

- Use the charging records for subsequent Access Legs generated in CS/IMS domain and the charging records generated in MGCF performing CS-IMS interworking, taking the complete service continuity history described above as reference, to perform the settlement between the providers of CS domain and IMS.

- Use the access network information in IMS charging records, taking the complete service continuity history described above as reference, to perform the settlement between the providers of IP-CAN and IMS Core.

- Additional reconciliation for I1 flows can also be applied, due to such flows being uniquely identifiable from other flows over the same bearer (see clause 4.8 of TS 23.292 [5] for more information).

- At least in roaming scenarios, the SCC-AS returns the ICID of the original access leg to the MSC-Server for the MSC-Server to include in charging records.

Annex A (informative): Controller UE and Controllee UE operations

A.1 General

Table A.1-1 provides an overview of Controller UE and Controllee UE operations.

Table A.1-1: Controller UE and Controllee UE operations

Operations		Controller UE	Controller UE Comment	Controllee UE	Controllee UE Comment
Add Media flow (local end initiating case)	Add media flow by creating a new Access Leg on the same UE	Yes	Standard SC procedures.	No	
	Add media flow by creating a new Access Leg on a different UE	Yes	New capability of Inter-UE.	No	The Controllee UE can accept/reject media flow addition using Standard IMS procedures.
	Add media flow to an existing Access Leg on the same UE	Yes	Standard IMS procedures.	No	
	Add media flow to an existing Access Leg on a different UE	Yes	New capability of Inter-UE.	No	The Controllee UE can accept/reject media flow addition using Standard IMS procedures.
Remove Media flow (local end initiating case)	Remove media flow from an Access Leg on the same UE.	yes	Standard IMS procedures.	Yes	If all the media flows are removed from the Access Leg, the Access Leg is released.
	Remove media flow an Access Leg on a different UE	Yes	New capability of Inter-UE.	No	
Invoke Supp Services	MMTEL service control with media on same UE (TS 22.173 [15])	Yes	Standard IMS procedures.	No	
	MMTEL service control with media on different UE (TS 22.173 [15])	Yes	New capability of Inter-UE.	No	
Collaborative Session Release		Yes	New capability of Inter-UE.	No	
Transfer Media flow	Transfer (in/out) of the media flow	Yes		No	Only Controller UE can initiate the transfer.

Annex B (informative): Change history

Change history								
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**Old**	**New**
2009-03	SP-43	SP-090123	0091	3	B	Information flow of real time media transfer from PS to the CS	8.3.0	9.0.0
2009-06	SP-44	SP-090350	0105	4	B	Addition of IUT call flow for controller initiated release collaborative session	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0106	1	B	Addition of IUT call flow for Controller Initiated Release Media- on a controller	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0107	2	B	Addition of IUT call flow for Controller Initiated Release Media- on a controlee UE	9.0.0	9.1.0
2009-06	SP-44	SP-090354	0112	1	B	Delete subclause 4.3.2	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0113	4	B	Enhance Scope for support of IUT scenarios	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0114	2	B	Addition of IUT definitions and abbreviations	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0115	5	B	IUT Architectural Requirements	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0116	2	B	IUT architecture model and reference points	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0117	3	B	Information flow for IUT - Remote Party initiated Collaborative Session termination procedure	9.0.0	9.1.0
2009-06	SP-44	SP-090358	0119	6	B	Interaction of session transfer and supplementary services	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0121	5	B	Information flow for IUT - Remote Party initiated media addition for a Collaborative Session	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0122	5	B	Information flow for IUT - Remote Party initiated release media for a Collaborative Session	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0124	5	B	Procedure for Collaborative Session.	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0125	5	B	Information flow of Controller Initiated Transfer Media: Controller to Controllee	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0126	5	B	Information flow of Controller Initiated Transfer Media: Controllee to Controllee	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0127	5	B	Information flow of Controller Initiated Add New Media: On Controllee	9.0.0	9.1.0
2009-06	SP-44	SP-090354	0130	4	B	Changes for SR VCC Emergency	9.0.0	9.1.0
2009-06	SP-44	SP-090350	0131	5	B	IUT without Collaborative Session flow	9.0.0	9.1.0
2009-06	SP-44	SP-090323	0132	2	A	Clarify terminology regarding Access Transfer and Session Transfer	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0136	5	B	Information flow for Controllee Initiated Modify Media	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0137	1	B	Controller/Controllee UE operations on a Collaborative Session	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0138	5	B	Collaborative Session establishment with new media on another UE	9.0.0	9.1.0
2009-06	SP-44	SP-090323	0142	1	A	Mid-call service support for Single Radio VCC where the Gm reference point is retained upon PS-level handover.	9.0.0	9.1.0
2009-06	SP-44	SP-090323	0143	-	F	Put I1 content back into Release 9 version of TS 23.237.	9.0.0	9.1.0
2009-06	SP-44	SP-090323	0145	-	A	Correlation CS anchored call with IMS Registration	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0146	2	D	Editorial corrections related to the use of 'Service Control'	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0147	2	B	Information flow for Controllee Initiated Release Media	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0149	2	B	SCC AS and UE functions for IUT	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0155	2	B	IUT interaction with MMTEL	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0156	1	B	Controller & Controllee UE operations	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0157	1	B	Access Domain Selection for Inter-UE Transfer	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0159	2	B	Mid-call services with speech and video session during session transfer	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0164	1	B	Information flow of Establish Collaborative Session by transferring media	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0165	-	B	Information flow of Controller Initiated Transfer Media Controllee to Controller	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0166	2	B	Add Origination, termination, registration subsection for IUT	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0167	1	F	Changes for section 6 and 6.3 to make it specific to Access transfer	9.0.0	9.1.0
2009-06	SP-44	SP-090349	0170	2	C	Contents of User Preferences for T-ADS	9.0.0	9.1.0
2009-06	SP-44	SP-090351	0171	2	B	Information flow for IUT - Remote Party initiated media modification for a Collaborative Session	9.0.0	9.1.0
2009-06	SP-44	SP-090352	0173	1	B	User preferences and IMS SC	9.0.0	9.1.0
2009-06	SP-44	SP-090352	0174	1	B	MSC Server enhancement to support mid-call services during access transfer	9.0.0	9.1.0
2009-06	SP-44	SP-090352	0177	2	F	Emergency calls out of scope for Inter-UE Transfer scenarios	9.0.0	9.1.0

Change history								
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**Old**	**New**
2009-06	SP-44	SP-090354	0178	1	B	Session Correlation for SRVCC	9.0.0	9.1.0
2009-06	SP-44	SP-090352	0179	1	B	Adding Inter-UE Transfer related basic assumptions	9.0.0	9.1.0
2009-06	SP-44	SP-090352	0180	-	B	Clarification of Session Transfer concepts to cover Inter-UE Transfer	9.0.0	9.1.0
2009-06	SP-44	SP-090352	0181	1	B	Modify information for Service Continuity to cover IUT	9.0.0	9.1.0
2009-06	SP-44	SP-090352	0184	1	B	IUT target discovery	9.0.0	9.1.0
2009-06	SP-44	SP-090352	0186	2	B	Information flow of Controller UE initiated media addition on itself	9.0.0	9.1.0
2009-06	SP-44	SP-090352	0187	2	B	Addition of IUT call flow for Controller Initiated modify Media- on a controllee	9.0.0	9.1.0
2009-06	SP-44	SP-090354	0188	2	B	Domain transfer procedure for SR-VCC Emergency	9.0.0	9.1.0
2009-06	SP-44	SP-090354	0189	-	B	Support Limited Service Mode for SR-VCC Emergency	9.0.0	9.1.0
2009-06	SP-44	SP-090354	0191	2	B	Mid-Call Services for SR-VCC session transfer using I1	9.0.0	9.1.0
2009-09	SP-45	SP-090603	0192	1	F	Corrections to SCC AS and UE roles	9.1.0	9.2.0
2009-09	SP-45	SP-090603	0193	-	F	Resolve Editor's Notes in Annex	9.1.0	9.2.0
2009-09	SP-45	SP-090603	0194	2	F	IUT Concepts	9.1.0	9.2.0
2009-09	SP-45	SP-090603	0195	-	F	IUT Flow Cleanups	9.1.0	9.2.0
2009-09	SP-45	SP-090603	0196	2	C	Discovery of UEs belonging to the same subscription for IUT	9.1.0	9.2.0
2009-09	SP-45	SP-090603	0197	1	F	Enhance scope to align with Rel-9 added functionality	9.1.0	9.2.0
2009-09	SP-45	SP-090603	0198	1	D	Editorial corrections	9.1.0	9.2.0
2009-09	SP-45	SP-090603	0199	1	F	Existing media treatment during Collaborative Session establishment	9.1.0	9.2.0
2009-09	SP-45	SP-090603	0205	-	F	Requirements of session transfer	9.1.0	9.2.0
2009-09	SP-45	SP-090603	0207	1	F	Remote Leg Update procedures for IUT	9.1.0	9.2.0
2009-09	SP-45	SP-090603	0208	-	F	Correcting a reference in "PS - CS Access Transfer: Conferencing - for UEs not using ICS capabilities"	9.1.0	9.2.0
2009-09	SP-45	SP-090603	0209	1	D	Editorial corrections: SRVCC, etc.	9.1.0	9.2.0
2009-09	SP-45	SP-090604	0212	2	F	Corrections on co-existence of ICS UE and mid-call assisted MSC-S	9.1.0	9.2.0
2009-09	SP-45	SP-090604	0213	-	F	Session Continuity for ICS UEs when multiple active voice sessions exist	9.1.0	9.2.0
2009-09	SP-45	SP-090604	0215	2	F	Clarifications on UE release of sessions prior to session transfer for non ICS UE	9.1.0	9.2.0
2009-09	SP-45	SP-090604	0216	1	F	Session Transfer for ICS UE when no session with active voice media exists.	9.1.0	9.2.0
2009-09	SP-45	SP-090601	0217	-	F	Renaming of E-SCC AS to EATF	9.1.0	9.2.0
2009-09	SP-45	SP-090604	0218	1	F	Restriction on TCP usage for inter-UE transfer NOT IMLEMENTED as Clause 6a.0.1 was deleted by CR0194R2.	9.1.0	9.2.0
2009-09	SP-45	SP-090604	0219	1	F	Alignment of User Preferences	9.1.0	9.2.0
2009-09	SP-45	SP-090604	0221	-	F	Registration in IMS when performing SRVCC	9.1.0	9.2.0
2009-09	SP-45	SP-090604	0222	-	F	Inconsistent description of access transfer procedures: MSC Server assisted mid-call feature	9.1.0	9.2.0
2009-09	SP-45	SP-090604	0225	-	F	Deleting transfer of Collaborative Session control in the table describing Controller UE and Controllee UE operations	9.1.0	9.2.0
2009-09	SP-45	SP-090604	0226	-	F	Correcting and Clarifying description of Controller UE initiated add new media on Controllee UE	9.1.0	9.2.0
2009-09	SP-45	SP-090604	0227	-	F	Clarifying description of Controller UE Initiated Release Collaborative Session	9.1.0	9.2.0
2009-12	SP-46	SP-090768	0235	3	A	Correcting terminations section inline with TS 23.292	9.2.0	9.3.0
2009-12	SP-46	SP-090791	0230	-	F	Corrections to SCC AS functionalities	9.2.0	9.3.0
2009-12	SP-46	SP-090791	0232	-	F	General corrections to indicate support of Access Transfer of video session	9.2.0	9.3.0
2009-12	SP-46	SP-090791	0233	-	F	A correction to the 'Basic Assumptions' of PS-CS Service Continuity	9.2.0	9.3.0
2009-12	SP-46	SP-090791	0236	1	F	Clarifications to the support of I1	9.2.0	9.3.0
2009-12	SP-46	SP-090791	0237	1	F	Support for single held sessions in SRVCC	9.2.0	9.3.0
2009-12	SP-46	SP-090791	0242	1	F	Information provided when sending IUT request	9.2.0	9.3.0
2009-12	SP-46	SP-090791	0243	-	F	Updates of the references to IUT 'Remote Leg Update' section	9.2.0	9.3.0
2009-12	SP-46	SP-090791	0244	1	F	Clarifying terminology and requirement regarding Service Continuity and Access Transfer	9.2.0	9.3.0
2009-12	SP-46	SP-090791	0245	1	F	Clarifying the PS-CS Access Transfer for voice and video	9.2.0	9.3.0
2009-12	SP-46	SP-090790	0247	1	F	IMS emergency session continuity related architecture update	9.2.0	9.3.0
2010-03	SP-47	SP-100142	0251	1	F	Correcting mismatched descriptions of IUT operation related to supplementary service execution	9.3.0	9.4.0
2010-03	SP-47	SP-100124	0255	1	A	Correction on media splitting case	9.3.0	9.4.0
2010-03	SP-47	SP-100142	0257	1	F	Correction on media splitting case	9.3.0	9.4.0

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Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**Old**	**New**
2010-03	SP-47	SP-100142	0259	1	F	MSC assisted mid-call feature corrections	9.3.0	9.4.0
2010-03	SP-47	SP-100152	0261	3	F	Support for held session in Dual-Radio	9.3.0	9.4.0
2010-06	SP-48	SP-100322	0271	1	F	Merging content of clause 6b into clause 6c and renaming of leftover 'E-SCC AS' to 'EATF'	9.4.0	9.5.0
2010-07						Editorial correction to previous entry in history table	9.5.0	9.5.1
2010-09	SP-49	SP-100537	0285	-	F	Corrections and clarifications related to IUT service profiles	9.5.1	9.6.0
2010-09	SP-49	SP-100541	0297	1	F	Clarification on STN-SR	9.5.1	9.6.0
2010-09	SP-49	SP-100541	0300	1	F	Modification the usage for instance ID in session transfer	9.5.1	9.6.0
2010-09	SP-49	SP-100536	0312	1	F	SRVCC for emergency call and use of equipment identifier	9.5.1	9.6.0
2010-09	SP-49	SP-100539	0329	-	F	Revised scope clause for alignment	9.5.1	9.6.0
2010-12	SP-50	SP-100677	0332	-	F	Removing a note that is no long valid according to stage 3	9.6.0	9.7.0
2011-03	SP-51	SP-110063	0362	2	F	Correction to correlation of charging information collected at the MSC for SRVCC in roaming scenarios	9.7.0	9.8.0

History

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