Technical Specification Group Services and System Aspects
Meeting #22, Maui, Hawaii, USA, 15-18 December 2003

# TSGS#22(03)0658

**Source:** TSG SA WG2
**Title:** CRs on 23.228 (IMS Stage 2)
**Agenda Item:** 7.2.3

The following Change Requests (CRs) have been approved by TSG SA WG2 and are requested to be approved by TSG SA plenary #22.
Note: the source of all these CRs is now S2, even if the name of the originating company(ies) is still reflected on the cover page of all the attached CRs.

| Tdoc # | Title | Spec | CR # | cat | Version in | REL | WI | S2 meeting | Clauses affected |
|---|---|---|---|---|---|---|---|---|---|
| S2-034283 | Restrictions on Sessions without IMS required capabilities | 23.228 | 367r1 | F | 5.10.0 | 5 | IMS-CCR | S2-36 | 5.4.2 |
| S2-034285 | Clarification of Trust Domain restriction for IMS | 23.228 | 377r1 | F | 5.10.0 | 5 | IMS-CCR | S2-36 | 2, 5.11.2 |
| S2-034305 | Clarification of Trust Domain for IMS | 23.228 | 378r1 | B | 6.3.0 | 6 | IMS2 | S2-36 | 2, 5.11.2 |
| S2-033717 | Terminology correction on “IMS User” | 23.228 | 352 | F | 6.3.0 | 6 | IMS2 | S2-35 | 4.3.3.4 |
| S2-033767 | Forking preferences | 23.228 | 353r2 | C | 6.3.0 | 6 | IMS2 | S2-35 | 4.2.7 |
| S2-033580 | Clarification of user data storage | 23.228 | 358 | C | 6.3.0 | 6 | IMS2 | S2-35 | 4.3.3.4 |
| S2-033769 | Introduction of Session based messaging architecture | 23.228 | 359r2 | B | 6.3.0 | 6 | IMS2 | S2-35 | 5.16.1, 5.16.1.1, 5.16.2 and new sections 5.16.2.1 and subsection of that. |
| S2-033601 | PSTN-initiated Hold and Resume of a Mobile-PSTN Session | 23.228 | 361 | F | 6.3.0 | 6 | IMS2 | S2-35 | 5.11.1.1, 5.11.1.2, 5.11.1.3 (new) |
| S2-033766 | PSI User | 23.228 | 362r1 | C | 6.3.0 | 6 | IMS2 | S2-35 | 5.4.12.2, 5.4.12.4 |
| S2-033765 | Transfer of CSCF capability on Cx | 23.228 | 365r1 | F | 6.3.0 | 6 | IMS2 | S2-35 | 5.1.2.1 |
| S2-033768 | Support of Multi-terminals | 23.228 | 366r1 | F | 6.3.0 | 6 | IMS2 | S2-35 | 5.2.1 |
| S2-034329 | Forking support in MGCF and AS | 23.228 | 368r2 | C | 6.3.0 | 6 | IMS2 | S2-36 | 4.2.7 |
| S2-034383 | AS originated sessions | 23.228 | 369r3 | B | 6.3.0 | 6 | IMS2 | S2-36 | 4.2.4 |
| S2-034330 | Requirements for IM CN Subsystem signalling flag | 23.228 | 371r2 | B | 6.3.0 | 6 | IMS2 | S2-36 | 4.2.6, E.2.1 |
| S2-034332 | Terminal Capability with SIP Registration | 23.228 | 375r2 | C | 6.3.0 | 6 | IMS2 | S2-36 | 2, 5.2.1 |
| S2-034300 | HSS as database for the PSI handling | 23.228 | 379r1 | C | 6.3.0 | 6 | IMS2 | S2-36 | 5.4.12.2 |
| S2-034301 | PSI corrections | 23.228 | 380r1 | C | 6.3.0 | 6 | IMS2 | S2-36 | 5.4.12, 5.4.12.2 |

**3GPP TSG-SA WG2 Meeting #36**
**New York, USA, 24-28 November 2003**

***Tdoc ⌘S2-034283***

*CR-Form-v7*

# CHANGE REQUEST

⌘ **23.228** **CR** **367** ⌘**rev** **1** ⌘ Current version: **5.10.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

***Proposed change affects:*** UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Restrictions on Sessions without IMS required capabilities |
| ***Source:*** | ⌘ | Siemens |
| ***Work item code:*** | ⌘ | IMS-CCR |
| ***Date:*** | ⌘ | 25/11/2003 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel-5 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*
*2 (GSM Phase 2)*
*R96 (Release 1996)*
*R97 (Release 1997)*
*R98 (Release 1998)*
*R99 (Release 1999)*
*Rel-4 (Release 4)*
*Rel-5 (Release 5)*
*Rel-6 (Release 6)*

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | Recently, the capability to optionally support re-establishment of sessions without the IMS required pre-conditions has been introduced to stage 2 specifications. The purpose has been to provide the Release-5 hooks to support interworking with external SIP networks in release 6. A particular motivation has been forward-compatibility like support of Rel-5 UEs in Rel-6 networks and vice versa. It has also been agreed that this should be under operator control.<br>However even Rel-6 UEs will always initiate a session with pre-conditions, and it will use establishment without pre-conditions only as a fall back mechanism towards external SIP clients. Thus interworking with external networks is the source of sessions without IMS required extensions, nothing else. Therefor also the restriction an operator should and can enforce is on interworking with external networks (and clients) rather than on dedicated SIP headers. |
| ***Summary of change:*** | ⌘ | Impose operator restriction on interworking with external SIP networks rather than on SIP header level. This restriction is also in place. Thus it is proposed to remove the restiction on SIP header level. |
| ***Consequences if not approved:*** | ⌘ | Different interpretations of stage 2 specification will prevent stage 3 agreement. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 5.4.2 |

| ***Other specs affected:*** ⌘ | Y | N | | ⌘ |
|---|---|---|---|---|
| | | X | Other core specifications | |
| | | X | Test specifications | |
| | | X | O&M Specifications | |

***Other comments:*** ⌘

**How to create CRs using this form:**

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

### 5.4.2 Interworking with Internet

Depending on operator policy, the S-CSCF may forward the SIP request or response to another SIP server located within an ISP domain outside of the IM CN subsystem.

It is possible that a remote SIP client does not support IMS required capabilities such as “Preconditions”, "Update” and “100rel” as described in 3GPP TS 24.229. If the remote SIP client does not support these capabilities, then the same session may be re-initiated by relaxing the requirements on the capabilities (by setting them to the status of desired) following the principle set by RFC 3261 [12]. However, general mechanisms for interworking between the IM CN subsystem and SIP servers/clients on the Internet are not specified in this Release.

~~The home network may impose restriction on session initiation without the IMS required capabilities.~~

**3GPP TSG-SA WG2 Meeting #36** ***TdocS2-034285***
**New York, U.S.A, 24th – 28th November, 2003**

*CR-Form-v7*

# CHANGE REQUEST

⌘ **23.228** **CR** **377** ⌘**rev** **1** ⌘ Current version: **5.10.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

***Proposed change affects:*** UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Clarification of Trust Domain restriction for IMS |
| ***Source:*** | ⌘ | Ericsson |
| ***Work item code:*** | ⌘ | IMS-CCR |
| ***Date:*** | ⌘ | 25/11/2003 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel-5 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*

| | |
|---|---|
| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | Within 3GPP, there has been ambiguity regarding the issue of the implications of the undefined Trust domain and privacy handling. SA3 & CN1 held a joint workshop and an LS was sent to SA2 with the conclusion of the meeting. This CR reflects changes according to the meeting agreement. |
| ***Summary of change:*** | ⌘ | Add references to the two Privacy & Trust Domain RFCs and clarify the 3gpp trust domain assumption (ie. closed network) for Rel-5. |
| ***Consequences if not approved:*** | ⌘ | Significant ambiguity in stage 2 specification. |

| | | | | | |
|---|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 2, 5.11.2 | | | |
| ***Other specs affected:*** | ⌘ | **Y** / **N** | Other core specifications | ⌘ | 33.203 |
| | | Y | | | |
| | | N | Test specifications | | |
| | | N | O&M Specifications | | |
| ***Other comments:*** | ⌘ | | | | |

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

************First change ******************

# 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 TS 23.002: "Network Architecture".

[2] CCITT Recommendation E.164: "Numbering plan for the ISDN era".

[3] CCITT Recommendation Q.65: "Methodology – Stage 2 of the method for the characterisation of services supported by an ISDN".

[4] ITU Recommendation I.130: "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN"

[5] GSM 03.64: "Digital cellular telecommunication system (Phase 2+); Overall Description of the General Packet Radio Service (GPRS) Radio Interface; Stage 2".

[6] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[7] 3GPP TS 23.221: "Architectural Requirements".

[8] 3GPP TS 22.228: "Service requirements for the IP multimedia core network subsystem"

[9] 3GPP TS 23.207: "End-to-end QoS concept and architecture"

[10] 3GPP TS 24.228: "Signalling flows for the IP multimedia call control based on SIP and SDP"

[10a] 3GPP TS 24.229: " IP Multimedia Call Control based on SIP and SDP; Stage 3"

[11] 3GPP TS 25.301: "Radio interface protocol architecture"

[11a] 3GPP TS 29.207: " Policy control over Go interface "

[12] RFC 3261: "SIP: Session Initiation Protocol"

[13] RFC 2396: "Uniform Resource Identifiers (URI): Generic Syntax"

[14] RFC 2486: "The Network Access Identifier"

[15] RFC 2806: "URLs for Telephone Calls"

[16] RFC 2916: "E.164 number and DNS"

[16a] RFC 3041: "Privacy Extensions for Stateless Address Autoconfiguration in IPv6"

[17] ITU Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies"

[18] ITU Recommendation H.248: "Gateway control protocol"

[19] 3GPP TS 33.203: "Access Security for IP-based services"

[20] 3GPP TS 33.210: "Network Domain Security: IP network layer security "

[21] 3GPP TS 26.235: "Packet Switched Multimedia Applications; Default Codecs".

[22] 3GPP TR 22.941: " IP Based Multimedia Services Framework "

[23] 3GPP TS 23.060: “General Packet Radio Service (GPRS); Service description; Stage 2

[24] 3GPP TS 23.003: “Technical Specification Group Core Network; Numbering, addressing and identification”

[25] 3GPP TS 32.200: “Telecommunication management; Charging management; Charging principles”

[26] 3GPP TS 32.225: ” Telecommunication Management; Charging Management; Charging Data Description for IP Multimedia Subsystem”

[27] 3GPP TS 22.071: “Technical Specification Group Services and System Aspects,Location Services (LCS);Service description, Stage 1”

[28] 3GPP TS 23.271: “Technical Specification Group Services and System Aspects, Functional stage 2 description of LCS”

[29] 3GPP TS 23.078: “Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3 - Stage 2”

[30] 3GPP TS 29.228:“IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents”

[xx] IETF RFC 3323 (2002): "A Privacy Mechanism for the Session Initiation Protocol (SIP)".

[yy] IETF RFC 3325 (2002): "Private Extensions to the Session Initiation Protocol (SIP) for Asserted Identity within Trusted Network".

************Second change ******************

## 5.11.2 Procedures for anonymous session establishment

This section gives information flows for the procedures for an anonymous session. However, sessions are not intended to be anonymous to the originating or terminating network operators.

The purpose of the mechanism is to give an IMS user the possibility to withhold certain identity information as specified in [xx] and [yy].

The privacy mechanism for IMS networks shall not create states in the CSCFs other than the normal SIP states.

In this release, the IMS entities shall consider the IMS networks to be a single Trust Domain for Asserted Identity as described in [yy].

### 5.11.2.1 Signalling requirements for anonymous session establishment

The user shall be able to request that her identity information is not revealed to the terminating party..

If the originating user requests the session to be anonymous, the terminating side must not reveal any identity or signalling routing information to the destination endpoint. The terminating network should distinguish at least two cases, first where the originator intended the session to be anonymous, and second where the originator’s identity was deleted by a transit network.

### 5.11.2.2 Bearer path requirements for anonymous session establishment

Procedures for establishment of an anonymous bearer path are not standardised in this release.

************End change ******************

**3GPP TSG-SA WG2 Meeting #36** **Tdoc S2-034305**
**New York, U.S.A, 24th – 28th November, 2003**

CR-Form-v7

# CHANGE REQUEST

⌘ **23.228** **CR** **378** ⌘ **rev** **1** ⌘ Current version: **6.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

***Proposed change affects:*** UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Clarification of Trust Domain for IMS |
| ***Source:*** | ⌘ | Ericsson |
| ***Work item code:*** | ⌘ | IMS2 |
| ***Date:*** | ⌘ | 26/11/2003 |
| ***Category:*** | ⌘ | **B** |
| ***Release:*** | ⌘ | Rel-6 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*

| | |
|---|---|
| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | Alignment with Rel- 5 CR & Rel 6 feature addition to handle identification of trusted domain. Within 3GPP, there has been ambiguity regarding the issue of the implications of the undefined Trust domain and privacy handling. SA3 & CN1 held a joint workshop and an LS was sent to SA2 with the conclusion of the meeting. This CR reflects changes according to the meeting agreement as well as work that needs to be done for Rel 6 where features like presence and interworking with Internet require further work on trust domain relationship. |
| ***Summary of change:*** | ⌘ | Add references to the two Privacy & Trust Domain RFCs and clarify the 3GPP trust domain assumption for Rel-6 need resolution. |
| ***Consequences if not approved:*** | ⌘ | |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 2, 5.11.2 |

| | | Y | N | | |
|---|---|---|---|---|---|
| ***Other specs affected:*** | ⌘ | | N | Other core specifications | ⌘ |
| | | | N | Test specifications | |
| | | | N | O&M Specifications | |

| | | |
|---|---|---|
| ***Other comments:*** | ⌘ | |

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

************First change ******************

# 2 References

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[3] CCITT Recommendation Q.65: "Methodology – Stage 2 of the method for the characterisation of services supported by an ISDN".

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[10a] 3GPP TS 24.229: " IP Multimedia Call Control based on SIP and SDP; Stage 3"

[11] 3GPP TS 25.301: "Radio interface protocol architecture"

[11a] 3GPP TS 29.207: " Policy control over Go interface "

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[17] ITU Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies"

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[29] 3GPP TS 23.078: “Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3 - Stage 2”

[29a] 3GPP TS 22.340: “ IMS Messaging; Stage 1”

[30] 3GPP TS 29.228:“IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents”

[31] 3GPP TS 23.240: "3GPP Generic User Profile - Architecture; Stage 2"

[32] 3GPP TS 22.250: “IP Multimedia Subsystem (IMS) group management”; Stage 1”

[33] RFC 2766: “Network Address Translation-Protocol Translation (NAT-PT)”

[34] RFC 2663: “IP Network Address Translator (NAT) Terminology and Considerations”

[35] Transition Scenarios for 3GPP Networks, draft-ietf-v6ops-3gpp-cases-03.txt, work in progress

[36] 3GPP TS 23.141: “Technical Specification Group Services and System Aspects, Presence Service”

[37] 3GPP TS 26.xxx:” IMS messaging and Presence; Media formats and codecs”

[xx] IETF RFC 3323 (2002): "A Privacy Mechanism for the Session Initiation Protocol (SIP)".

[yy] IETF RFC 3325 (2002): "Private Extensions to the Session Initiation Protocol (SIP) for Asserted Identity within Trusted Network".

************Second change ******************

## 5.11.2 Procedures for anonymous session establishment

This section gives information flows for the procedures for an anonymous session. However, sessions are not intended to be anonymous to the originating or terminating network operators.

The purpose of the mechanism is to give an IMS user the possibility to withhold certain identity information as specified in [xx] and [yy].

The privacy mechanism for IMS networks shall not create states in the CSCFs other than the normal SIP states.

IMS entities shall determine whether they are communicating with an element of the same Trust Domain for Asserted Identity or not as described in [yy].

************End of change ******************

**3GPP TSG-SA WG2 Meeting #35**
**Bangkok, Thailand, 27-31 Oct 2003**

***Tdoc ⌘S2-033717***

*CR-Form-v7*

# CHANGE REQUEST

⌘ **23.228** **CR** **352** ⌘**rev** ⌘ Current version: **6.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

***Proposed change affects:*** UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Terminology correction on "IMS User" |
| ***Source:*** | ⌘ | Fujitsu |
| ***Work item code:*** | ⌘ | IMS2 |
| ***Date:*** | ⌘ | 28/10/2003 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel-6 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*

| | |
|---|---|
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| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | The present description in 4.3.3.4 specifies some behaviours of IMS user. However, IMS user can be easily understood as human beings and specifications can not specify the behaviour of human beings, but the devices they use. Therefore, some corrections on the terminologies are needed. |
| ***Summary of change:*** | ⌘ | Change the some "IMS Users" in 4.3.3.4 to "third party registration". |
| ***Consequences if not approved:*** | ⌘ | Incorrect terminology |

| | | | | | |
|---|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 4.3.3.4 | | | |
| | | **Y** | **N** | | |
| ***Other specs affected:*** | ⌘ | | **X** | Other core specifications | ⌘ |
| | | | **X** | Test specifications | |
| | | | **X** | O&M Specifications | |
| ***Other comments:*** | ⌘ | | | | |

**How to create CRs using this form:**
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

### 4.3.3.4 Relationship of private and public user identities

It is not a requirement for a user to be able to register on behalf of another user which is third party registration specified in [12] or for a device to be able to register on behalf of another device or for combinations of the above for the IM CN subsystem for this release.

**3GPP TSG-SA2 Meeting #35** ***Tdoc S2-033767***
**Bangkok, Thailand October 27 - 31, 2003**

*CR-Form-v7*

# CHANGE REQUEST

⌘ **23.228** **CR** **353** ⌘**rev** **2** ⌘ Current version: **6.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

***Proposed change affects:*** UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Forking preferences |
| ***Source:*** | ⌘ | Nokia |
| ***Work item code:*** | ⌘ | IMS2 |
| ***Date:*** | ⌘ | 27/10/2003 |
| ***Category:*** | ⌘ | **C** |
| ***Release:*** | ⌘ | Rel-6 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*

| | |
|---|---|
| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

***Reason for change:*** ⌘
As a native SIP feature, the capability to fork incoming requests has been added to IMS. However, it has not been defined yet how the S-CSCF decides whether to fork in a paralell or in a sequential manner.

***Summary of change:*** ⌘
When there are multiple contacts registered for a public user identity, the S-CSCF forks the terminating request to these contact addresses. The S-CSCF can perform forking either parallel or sequentially based on the information the S-CSCF has when receiving the request. The UE shall be able to indicate its relative preference to be used for forking during the registration as defined in the RFC 3261.

***Consequences if not approved:*** ⌘

***Clauses affected:*** ⌘ 4.2.7

| | Y | N | | | |
|---|---|---|---|---|---|
| ***Other specs affected:*** ⌘ | X | | Other core specifications | ⌘ | 24.229 |
| | | X | Test specifications | | |
| | | X | O&M Specifications | | |

***Other comments:*** ⌘

**How to create CRs using this form:**

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

## 4.2.7 Support of SIP forking

SIP forking is the ability of a SIP proxy server to fork SIP request messages to multiple destinations according to RFC 3261 [12].

The IM CN subsystem shall have the capability to fork requests to multiple destinations; this capability is subject to rules for forking proxies defined in RFC 3261 [12].

- The S-CSCF shall support the ability for a public user identity to be registered from multiple contact addresses, as defined in RFC 3261 [12]. The S-CSCF shall support forking so that an incoming SIP request addressed to a Public User Identity is proxied to multiple registered contact addresses. This allows forking across multiple contact addresses of the same Public User Identity.

- When multiple contact addresses have been registered, then the S-CSCF shall fork the incoming SIP request. If the UE has indicated preference information upon registration, then the S-CSCF shall use it to decide if parallel or sequential forking is used, as described in RFC 3261 [12]. If the UE has not indicated any preference for the contact addresses upon registration, or if the preferences for the contact addresses have equal value, then it is up to the S-CSCF if parallel or sequential forking is to be performed.

- Application Servers in the IMS may act as a forking proxy in the sense of RFC 3261 [12] and may fork a SIP request across multiple Public User Identities allocated to the same user. S-CSCFs shall provide the necessary support for forking by Application Servers.

Additionally, other networks outside the IM CN Subsystem are able to perform SIP forking.

UEs shall be ready to receive responses generated due to a forked request and behave according to the procedures specified in [12] and in this section.

The UE may accept or reject early dialogues from different terminations as described in [12], for example if the UE is only capable of supporting a limited number of simultaneous dialogs.

Upon the reception of a first final 200 OK (for INVITE), the UE shall acknowledge the 200 OK and cancel other early dialogues that may have been established. The UE may require updating the allocated resources according to the resources needed. In case the UE receives a subsequent 200 OK, the UE shall acknowledge the dialogue and immediately send a BYE to drop the dialog.

The UE shall be able to include preferences, in INVITE's, indicating that proxies should not fork the INVITE request.

On the terminating side, a UE shall be able to receive, as specified in [12], several requests for the same dialog that were forked by a previous SIP entity.

**3GPP TSG-SA WG2 Meeting #35**
**Bangkok, Thailand, 27-31 October, 2003**

***Tdoc ⌘S2-033580***

*CR-Form-v7*

# CHANGE REQUEST

⌘ **23.228** **CR** **358** ⌘**rev** **-** ⌘ Current version: **6.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

***Proposed change affects:*** UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Clarification of user data storage |
| ***Source:*** | ⌘ | Nokia |
| ***Work item code:*** | ⌘ | IMS2 |
| ***Date:*** | ⌘ | 27/10/2003 |
| ***Category:*** | ⌘ | **C** |
| ***Release:*** | ⌘ | Rel-6 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*

| | |
|---|---|
| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

***Reason for change:*** ⌘ The multiple IMS registration concept has been added to Rel6, however, it is not clearly stated in the specification how the user data related to such registrations is stored in the network. More specifically, it is not clear if all the user data related to shared Public User Identities are stored in the same HSS, or if they are allowed to be stored in different HSSs. This has an impact to stage-3 protocol design, hence needs to be clarified.

***Summary of change:*** ⌘ It is explicitly stated that all subscription data related to a single user is stored in a single HSS, even if the user has shared Public User Identifiers.

***Consequences if not approved:*** ⌘

***Clauses affected:*** ⌘ 4.3.3.4

***Other specs affected:*** ⌘

| Y | N | | |
|---|---|---|---|
| X | | Other core specifications | ⌘ 23.008, 29.228, 29.229 |
| | X | Test specifications | |
| | X | O&M Specifications | |

***Other comments:*** ⌘

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

### 4.3.3.4 Relationship of private and public user identities

The home network operator is responsible for the assignment of the private user identifier, and public user identifiers; other identities that are not defined by the operator may also exist.

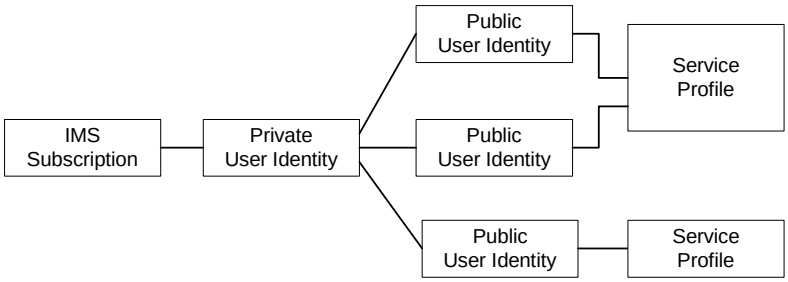


**Figure 4.5: Relationship of the private user identity and public user identities**

The IMS Service Profile is a collection of service and user related data as defined in 3GPP TS 29.228 [30]. The Service Profile is independent from the Implicit Registration Set, e.g. IMPUs with different Service Profiles may belong to the same Implicit Registration Set. Initial filter criteria in the service profile provide a simple service logic comprising of user / operator preferences that are of static nature i.e. they do not get changed on a frequent basis.

Application servers will provide more complex and dynamic service logic that can potentially make use of additional information not available directly via SIP messages (e.g. location, time, day etc.).

The IMS Service profile is defined and maintained in the HSS and its scope is limited to IM CN Subsystem. The service profile is downloaded from the HSS to the S-CSCF.Only one service profile per Public user identity is downloaded to the S-CSCF at a given time (such as at registration, update of a profile etc.) based on the Public user identities being served by the S-CSCF. Nothing precludes that multiple service profiles can be defined in the HSS for a subscription. Each Public user identity is associated with one and only one Service Profile. Each service profile is associated with one or more Public user identities.

An ISIM application shall securely store the home domain name of the subscriber. It shall not be possible for the UE to modify the information from which the home domain name is derived.

It is not a requirement for a user to be able to register on behalf of another user or for a device to be able to register on behalf of another device or for combinations of the above for the IM CN subsystem for this release.

Public User Identities may be shared across multiple UEs. Hence, a particular Public User Identity may be simultaneously registered from multiple UEs that use different Private User Identities and different contact addresses. Subscription data may restrict a user from having the same Public User Identity simultaneously registered from multiple contact addresses. If a Public User Identity belongs to an IMS subscription and it is shared among the Private User Identities, then it is assumed that all Private User Identities share the Public User Identity within the IMS subscription. The relationship for such a shared Public User Identity with Private User Identities, and the resulting relationship with service profiles, is depicted in Figure 4.6 below.

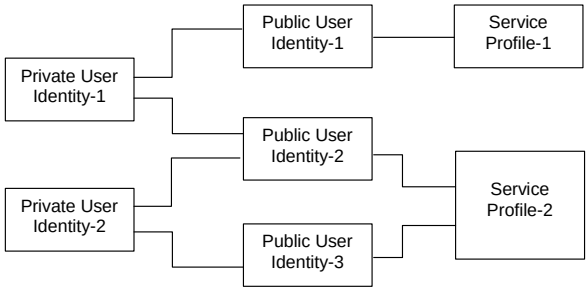


**Figure 4.6 – The relation of a shared Public User Identity (Public-ID-2) and Private User Identities**

All Service Profiles of a user, which share at least one common Private user identity through their relationship to public user identities, shall be associated to the same S-CSCF. Later releases may allow different Service Profiles that share the same Private user identity to be associated with different S-CSCFs.

All Service Profiles of a user shall be stored in the same HSS, even if the user has one or more shared Public User identities.

**3GPP TSG-SA2 Meeting #35**
**Bangkok, Thailand, 27th – 31st October, 2003**

***Tdoc ⌘S2-033769~~591~~***

*CR-Form-v7*

# CHANGE REQUEST

⌘ **23.228** **CR** **359** ⌘**rev** **2** ⌘ Current version: **6.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

***Proposed change affects:*** UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Introduction of Session based messaging architecture |
| ***Source:*** | ⌘ | Ericsson |
| ***Work item code:*** | ⌘ | IMS2 |
| ***Date:*** | ⌘ | 30/10/2003 |
| ***Category:*** | ⌘ | **B** |
| ***Release:*** | ⌘ | Rel-6 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*

| | |
|---|---|
| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | SA2 has until now left session based messaging architecture work incomplete, this contribution introduces the architecture and principles for support of session based messaging in IMS. |
| ***Summary of change:*** | ⌘ | Some additional architecture principles and flow examples section has been added for Session based messaging. |
| ***Consequences if not approved:*** | ⌘ | Stage 3 work for session based messaging within Rel-6 will be further delayed due to lack of overall architural work being not done. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 5.16.1, 5.16.1.1, 5.16.2 and new sections 5.16.2.1 and subsection of that. |

| | | Y | N | | |
|---|---|---|---|---|---|
| ***Other specs affected:*** | ⌘ | | N | Other core specifications | ⌘ |
| | | | N | Test specifications | |
| | | | N | O&M Specifications | |
| ***Other comments:*** | ⌘ | | | | |

**How to create CRs using this form:**
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downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

********** First Change**********

## 5.16 IMS messaging concepts and procedures

This clause describes architectural concepts and procedures for providing Messaging in the IM CN Subsystem. The service enablers for Messaging and possible reuse of IMS service enablers within this context as well security and charging expectations, addressing, privacy, content handling and limitations, filtering, media types and message lengths, etc. are to be further studied.

Any ISIM related architectural requirements would be studied as part of overall IMS Messaging.

### 5.16.1 Immediate Messaging

This sub-clause describes architectural concepts and procedures for fulfiling the requirements for –Immediate Messaging described in TS 22.340 [29a].

#### 5.16.1.1 Procedures to enable Immediate Messaging

IMS users shall be able to exchange immediate messages with each other by using the procedure described in this sub-clause. This procedure shall allow the exchange of any type of multimedia content (subject to possible restrictions based on operator policy and user preferences/intent), for example but not limited to:-

- Pictures, video clips, sound clips with a format defined by 3GPP TS 26.xxx [37]

The sender UE can include an indication in the message regarding the length of time the message will be considered valid.

##### 5.16.1.1.1 Immediate messaging procedure to registered public user identity

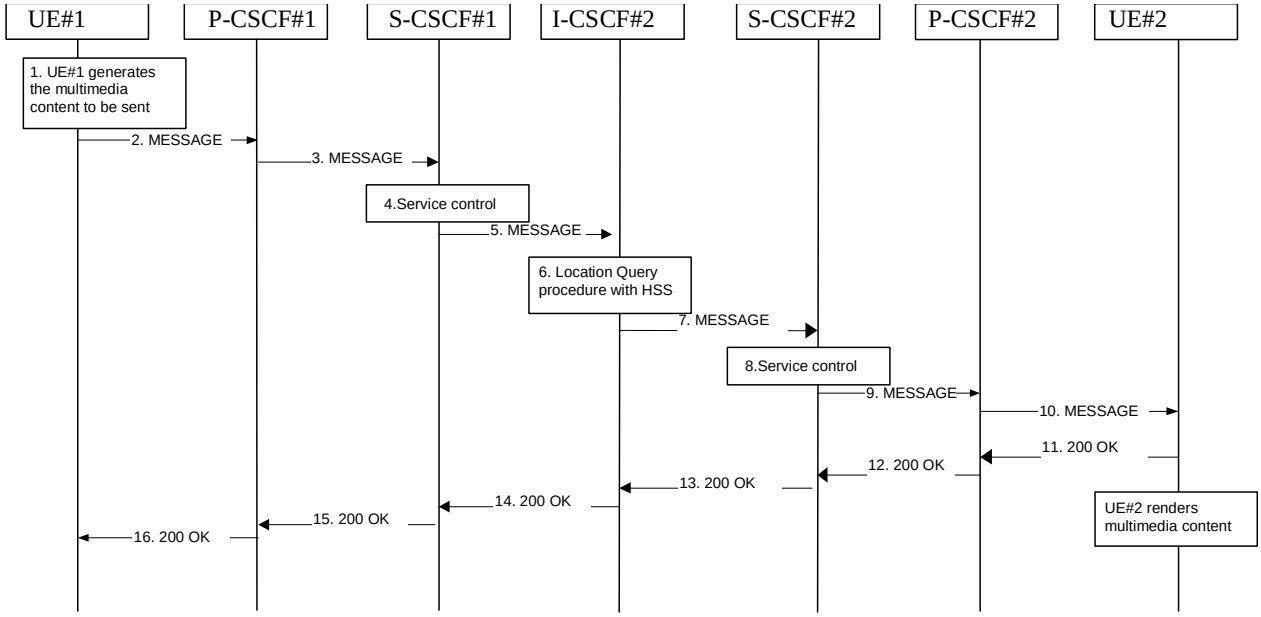


**Figure 5.47: Immediate Messaging procedure to registered public user identity**

1. UE#1 generates the multimedia content intended to be sent to UE#2.
2. UE#1 sends the MESSAGE request to P-CSCF#1 that includes the multimedia content in the message body.
3. P-CSCF#1 forwards the MESSAGE request to S-CSCF#1 along the path determined upon UE#1's most recent registration procedure.
4. Based on operator policy S-CSCF#1 may reject the MESSAGE request with an appropriate response, e.g. if content length or content type of the MESSAGE are not acceptable. S-CSCF#1 invokes whatever service control logic is appropriate for this MESSAGE request. This may include routing the MESSAGE request to an application server, which processes the request further on.
5. S-CSC#1 forwards the MESSAGE request to I-CSCF#2.
6. I-CSCF#2 performs Location Query procedure with the HSS to acquire the S-CSCF address of the destination user (S-CSCF#2).
7. I-CSCF#2 forwards the MESSAGE request to S-CSCF#2.
8. Based on operator policy S-CSCF#2 may reject the MESSAGE request with an appropriate response, e.g. if content length or content type of the MESSAGE are not acceptable. S-CSCF#2 invokes whatever service control logic is appropriate for this MESSAGE request. This may include routing the MESSAGE request to an application server, which processes the request further on.
   For example, the UE#2 may have a service activated that blocks the delivery of incoming messages that fullfill criterias set by the user. The AS may then respond to the MESSAGE request with an appropriate error response.
9. S-CSCF#2 forwards the MESSAGE request to P-CSCF#2 along the path determined upon UE#2's most recent registration procedure.
10. P-CSCF#2 forwards the MESSAGE request to UE#2. After receiving the MESSAGE UE#2 renders the multimedia content to the user.
11. – 16. UE#2 acknowledges the MESSAGE request with a response that indicates that the destination entity has received the MESSAGE request. The response traverses the transaction path back to UE#1.

#### 5.16.1.1.2 Immediate messaging procedure to unregistered public user identity

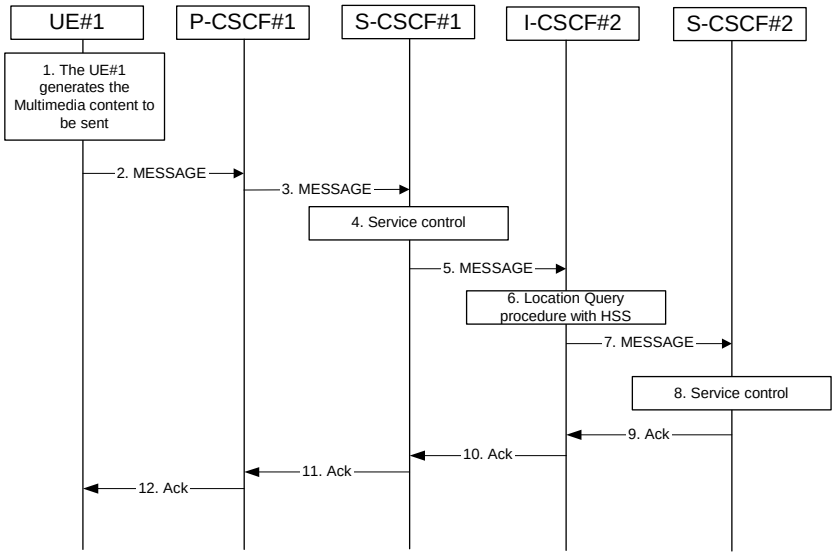


**Figure 5.48: Immediate messaging to unregistered public user identity, service control invoked**

1-5. The same actions apply as for when the Public user identity is registered, see step 1-5 in clause 5.16.1.1.1.

6. I-CSCF#2 interacts with the HSS as per the terminating procedures defined for unregistered public user identities in clause 5.12.1. If the public user identity has no services related to unregistered state activated the interaction with HSS would be as per the procedure defined in clause 5.12.2.

7. I-CSCF#2 forwards the MESSAGE request to S-CSCF#2.

8. Based on operator policy S-CSCF#2 may reject the MESSAGE request with an appropriate response, e.g. if content length or content type of the MESSAGE are not acceptable or the UE#2 does not have a service activated that temporarily hold the MESSAGE request in the network.

S-CSCF#2 invokes whatever service control logic appropriate for this MESSAGE request. This may include routing the MESSAGE request to an application server, which processes the request further on.

For example, the UE#2 may have a service activated that allows delivery of any pending MESSAGE request. The AS may then hold the MESSAGE request and deliver the MESSAGE request when the UE#2 becomes reachable. In this case, depending on user settings UE#2 controls the delivery of the pending MESSAGEs.

9-12. The MESSAGE request is acknowledged with an appropriate acknowledgement response. The acknowledgement response traverses the transaction path back to UE#1.

### 5.16.1.2 Immediate messages with multiple recipients

IMS users shall be able to send a single immediate message to multiple recipients, as specified in 3GPP TS 22.340 [29a]. The following means are supported to achieve this:

- A PSI identifying a new group is created in the appropriate Application Server, and members are added to this group (e.g. by the user via the Ut interface or by the operator via O&M mechanisms). Immediate messages addressed to this PSI will be routed to the AS hosting the PSI, and this AS shall create and send immediate messages addressed to a group member of the group identified by the PSI.

- The user can send an immediate message by indicating the individual addresses (Public User Identities for IMS recipients) of the intended recipients as part of the immediate message. The AS of the user shall then create and send immediate messages addressed to each one of the intended recipients.

## 5.16.2 Session-based Messaging

This subclause describes architectural concepts and procedures for fulfiling the requirements for Session-based Messaging described in TS 22.340 [29a].

### 5.16.2.1 Architectural principles

Session-based IMS messaging communications shall as much as possible use the same basic IMS session delivery mechanisms (e.g. routing, security, service control) as defined in clause 4 and 5 of this document. For session based messaging the session shall include a messaging media component, other media components may also be included. Once the session containing a messaging media component is established, messages in the session are transported between the session participants as per the parameters defined in the messaging media component part of the session description (SDP).

For addressing chat-group-type session based messaging the concept of Public Service Identities is used.

Session based messaging is available for users that are registered in the IMS.

The session based messaging shall be able to provide the following functionality:

-Per-message-based charging, as well as content- and size-based charging.

-Operator-controlled policy to be set on the size and content of the messages.

-Support for a messaging media component as part of a session where other media components are also included.

-Support for messaging-only sessions.

### 5.16.2.2 Procedures to enable Session based Messaging

IMS users shall be able to exchange session-based messages with each other by using the procedure described in this sub-clause. This procedure shall allow the exchange of any type of multimedia content (subject to possible restrictions based on operator policy and user preferences/intent), for example but not limited to:

- Pictures, video clips, sound clips with a format defined by 3GPP TS 26.xxx [37]

#### 5.16.2.2.1 Session based messaging procedure to registered public user identity

Editor's note: This sub-clause will describe session based messaging between two UEs.

#### 5.16.2.2.2 Session based messaging procedure using multiple UEs

Editor's note: This sub-clause will describe session based messaging between multiple UEs using for example a Chat session.

---

********** End of Change**********

**3GPP TSG-SA WG2 Meeting #35** **Tdoc ⌘S2-033601**
**Bangkok, Thailand, 27.-31. October 2003**

CR-Form-v7

# CHANGE REQUEST

⌘ **23.228** **CR** **361** ⌘**rev** **-** ⌘ Current version: **6.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

***Proposed change affects:*** UICC apps⌘ [X] ME [ ] Radio Access Network [ ] Core Network [X]

| | | |
|---|---|---|
| ***Title:*** | ⌘ | PSTN-initiated Hold and Resume of a Mobile-PSTN Session |
| ***Source:*** | ⌘ | Siemens |
| ***Work item code:*** | ⌘ | IMS-2 |
| ***Date:*** | ⌘ | 21/10/2003 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel-6 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*
*2 (GSM Phase 2)*
*R96 (Release 1996)*
*R97 (Release 1997)*
*R98 (Release 1998)*
*R99 (Release 1999)*
*Rel-4 (Release 4)*
*Rel-5 (Release 5)*
*Rel-6 (Release 6)*

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | Currently TS 23.228 currently gives two example flows for hold and resume procedures. However there is no flow, which shows a PSTN initiated hold. This has lead to ambiguity (see N3-030659 = S2-033314). |
| ***Summary of change:*** | ⌘ | Add a new sub-clause with a flow for a PSTN-initiated Hold and Resume of a Mobile-to-PSTN Session. |
| ***Consequences if not approved:*** | ⌘ | Ambiguity whether the IMS supports interworking with PSTN initiated hold and resume procedures. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 5.11.1.1, 5.11.1.2, 5.11.1.3 (new) |

| ***Other specs affected:*** ⌘ | Y | N | | ⌘ |
|---|---|---|---|---|
| | | X | Other core specifications | |
| | | X | Test specifications | |
| | | X | O&M Specifications | |

***Other comments:*** ⌘

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

## 5.11 Procedures to enable enhanced multimedia services

### 5.11.1 Session Hold and Resume Procedures

This section gives information flows for the procedures for placing sessions on hold that were previously established by the mechanisms of sections 5.4, 5.5, 5.6, and 5.7, and resuming the session afterwards. Two cases are presented: mobile-to-mobile (UE-UE), and a UE-initiated hold of a UE-PSTN session.

For a multi-media session, it shall be possible to place a subset of the media streams on hold while maintaining the others.

These procedures do not show the use of optional I-CSCFs. If an I-CSCF was included in the signalling path during the session establishment procedure, it would continue to be used in any subsequent flows such as the ones described in this section.

#### 5.11.1.1 Mobile-to-Mobile Session Hold and Resume Procedures

An IMS session was previously established between an initiating UE and a terminating UE. Each of these UEs has an associated P-CSCF, and a S-CSCF assigned in their home network. ~~These functional elements co-operate to clear the session, and t~~ The procedures are independent of whether ~~they~~ the P-CSCFs are located in the home or visited networks. Therefore there is no distinction in this section of home network vs. visited network.

The hold and resume procedures are identical whether the UE that initiated the session also initiates the session-hold, or whether the UE that terminated the session initiates the session-hold.

When a media stream has been placed on hold, it shall not be resumed by any endpoint other than the one that placed it on hold.

The procedures for placing a media stream on hold, and later resuming the media stream, are as shown in the following information flow:

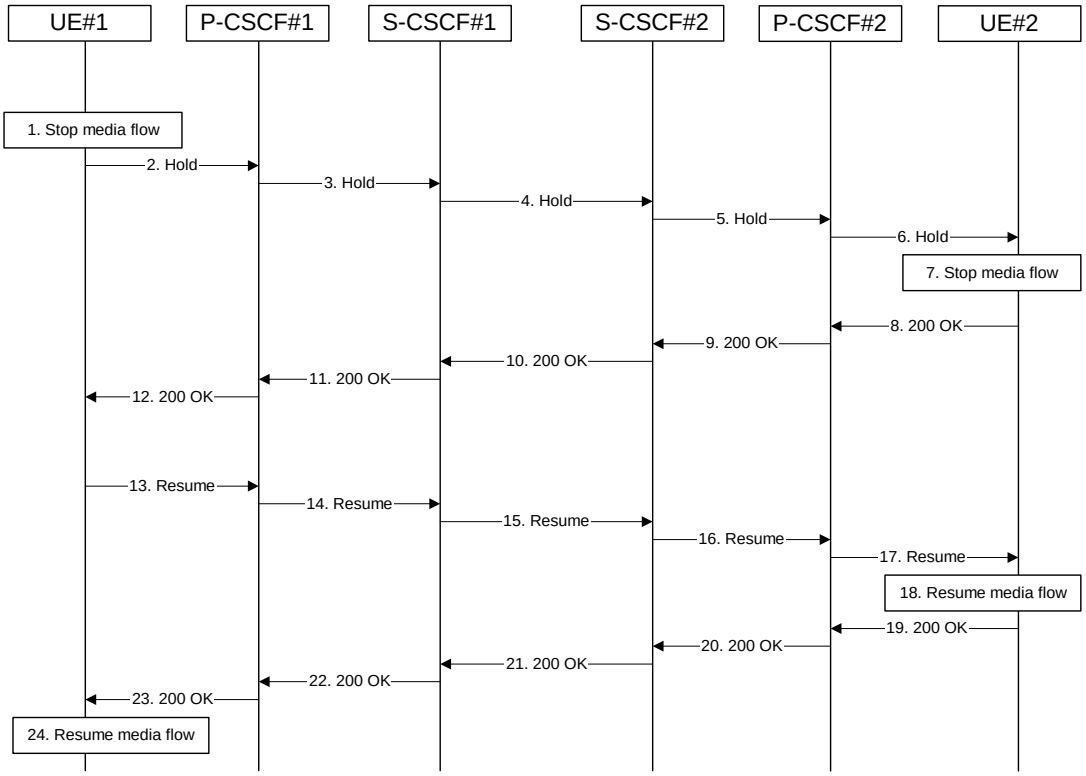


**Figure 5.28: Mobile to Mobile session hold and resume**

Information flow procedures are as follows:

1. UE#1 detects a request from the user to place a media stream on hold. UE#1 stops sending the media stream to the remote endpoint, but keeps the resources for the session reserved.
2. UE#1 sends a Hold message to its proxy, P-CSCF#1.
3. P-CSCF#1 forwards the Hold message to S-CSCF#1.
4. S-CSCF#1 forwards the Hold message to S-CSCF#2.
5. S-CSCF#2 forwards the Hold message to P-CSCF#2.
6. P-CSCF#2 forwards the Hold message to UE#2.
7. UE#2 stops sending the media stream to the remote endpoint, but keeps the resources for the session reserved.
8. UE#2 acknowledges receipt of the Hold message with a 200-OK final response, send to P-CSCF#2.
9. P-CSCF#2 forwards the 200 OK final response to S-CSCF#2.
10. S-CSCF#2 forwards the 200 OK final response to S-CSCF#1.
11. S-CSCF#1 forwards the 200 OK final response to P-CSCF#1.
12. P-CSCF#1 forwards the 200 OK final response to UE#1.
13. UE#1 detects a request from the user to resume the media stream previously placed on hold. UE#1 sends a Resume message to its proxy, P-CSCF#1.
14. P-CSCF#1 forwards the Resume message to S-CSCF#1.
15. S-CSCF#1 forwards the Resume message to S-CSCF#2.
16. S-CSCF#2 forwards the Resume message to P-CSCF#2.

17. P-CSCF#2 forwards the Resume message to UE#2.

18. UE#2 resumes sending the media stream to the remote endpoint.

19. UE#2 acknowledges receipt of the Resume message with a 200-OK final response, sent to P-CSCF#2.

20. P-CSCF#2 forwards the 200 OK final response to S-CSCF#2.

21. S-CSCF#2 forwards the 200 OK final response to S-CSCF#1.

22. S-CSCF#1 forwards the 200 OK final response to P-CSCF#1.

23. P-CSCF#1 forwards the 200 OK final response to UE#1.

24. UE#1 resumes sending the media stream to the remote endpoint.

### 5.11.1.2 Mobile-initiated Hold and Resume of a Mobile-PSTN Session

An IMS session was previously established between an initiating UE and a MGCF acting as a gateway for a session terminating on the PSTN, or between an initiating MGCF acting as a gateway for a session originating on the PSTN to a terminating UE. The UE has an associated P-CSCF, an S-CSCF assigned in its home network, and a BGCF that chooses the MGCF. ~~These functional elements co-operate to clear the session, and t~~The procedures are independent of whether the~~y~~ P-CSCF ~~are~~is located in the subscriber's home or visited network~~s~~. Therefore there is no distinction in this section of home network vs. visited network.

The session hold and resume procedure is similar whether the UE initiated the session to the PSTN, or if the PSTN initiated the session to the UE. The only difference is the optional presence of the BGCF in the case of a session initiated by the UE. Note that the BGCF might or might not be present in the signalling path after the first INVITE is routed.

The procedures for placing a media stream on hold, and later resuming the media stream, are as shown in the following information flow:

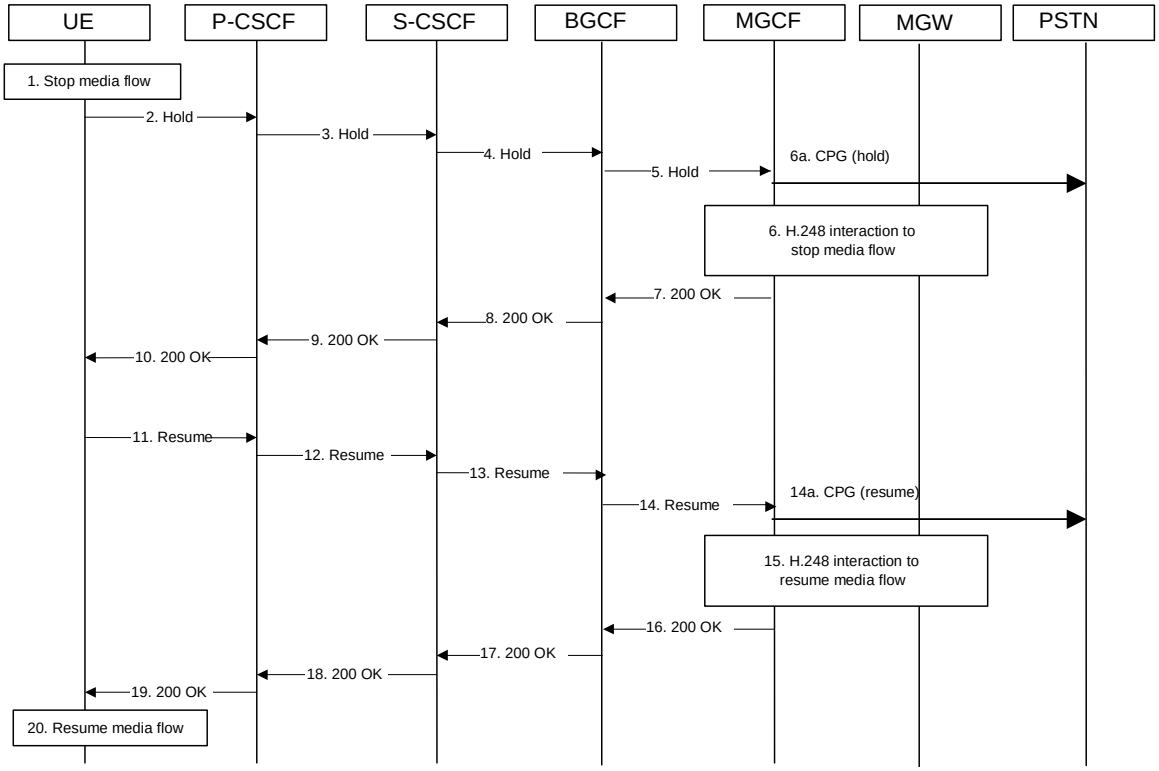


**Figure 5.29: Mobile-initiated Hold and Resume of a Mobile-PSTN Session~~Mobile to PSTN session hold and resume~~**

Information flow procedures are as follows:

1. UE detects a request from the user to place a media stream on hold. UE#1 stops sending the media stream to the remote endpoint, but keeps the resources for the session reserved.
2. UE sends a Hold message to its proxy, P-CSCF.
3. P-CSCF forwards the Hold message to S-CSCF.
4. S-CSCF forwards the Hold message to BGCF.
5. BGCF forwards the Hold message to MGCF.

5a MGCF sends a CPG(hold) in order to express that the call has been placed on hold.

6. MGCF initiates a H.248 interaction with MGW instructing it to stop sending the media stream, but to keep the resources for the session reserved.
7. MGCF acknowledges receipt of the Hold message with a 200-OK final response, send to BGCF.
8. BGCF forwards the 200-OK to the S-CSCF.
9. S-CSCF forwards the 200 OK final response to P-CSCF.
10. P-CSCF forwards the 200 OK final response to UE.
11. UE detects a request from the user to resume the media stream previously placed on hold. UE sends a Resume message to its proxy, P-CSCF.
12. P-CSCF forwards the Resume message to S-CSCF.
13. S-CSCF forwards the Resume message to BGCF.
14. BGCF forwards the Resume message to MGCF.

14a. MGCF sends a CPG(resume) in order to resume the call.

15. MGCF initiates a H.248 interaction with MGW instructing it to resume sending the media stream.
16. MGCF acknowledges receipt of the Resume message with a 200-OK final response, sent to BGCF.
17. BGCF forwards the 200 OK final response to the S-CSCF.
18. S-CSCF forwards the 200 OK final response to P-CSCF.
19. P-CSCF forwards the 200 OK final response to UE.
20. UE resumes sending the media stream to the remote endpoint.

#### 5.11.1.3 PSTN-initiated Hold and Resume of a Mobile-PSTN Session

An IMS session was previously established between an initiating UE and a MGCF acting as a gateway for a session terminating on the PSTN, or between an initiating MGCF acting as a gateway for a session originating on the PSTN to a terminating UE. The UE has an associated P-CSCF, an S-CSCF assigned in its home network, and a BGCF that chooses the MGCF. The procedures are independent of whether the P-CSCF is located in the subscriber's home or visited network. Therefore there is no distinction in this section of home network vs. visited network.

The session hold and resume procedure is similar whether the UE initiated the session to the PSTN, or if the PSTN initiated the session to the UE. The only difference is the optional presence of the BGCF in the case of a session initiated by the UE. Note that the BGCF might or might not be present in the signalling path after the first INVITE is routed.

The following information flow shows the procedures, where the session is set on hold from the PSTN side:

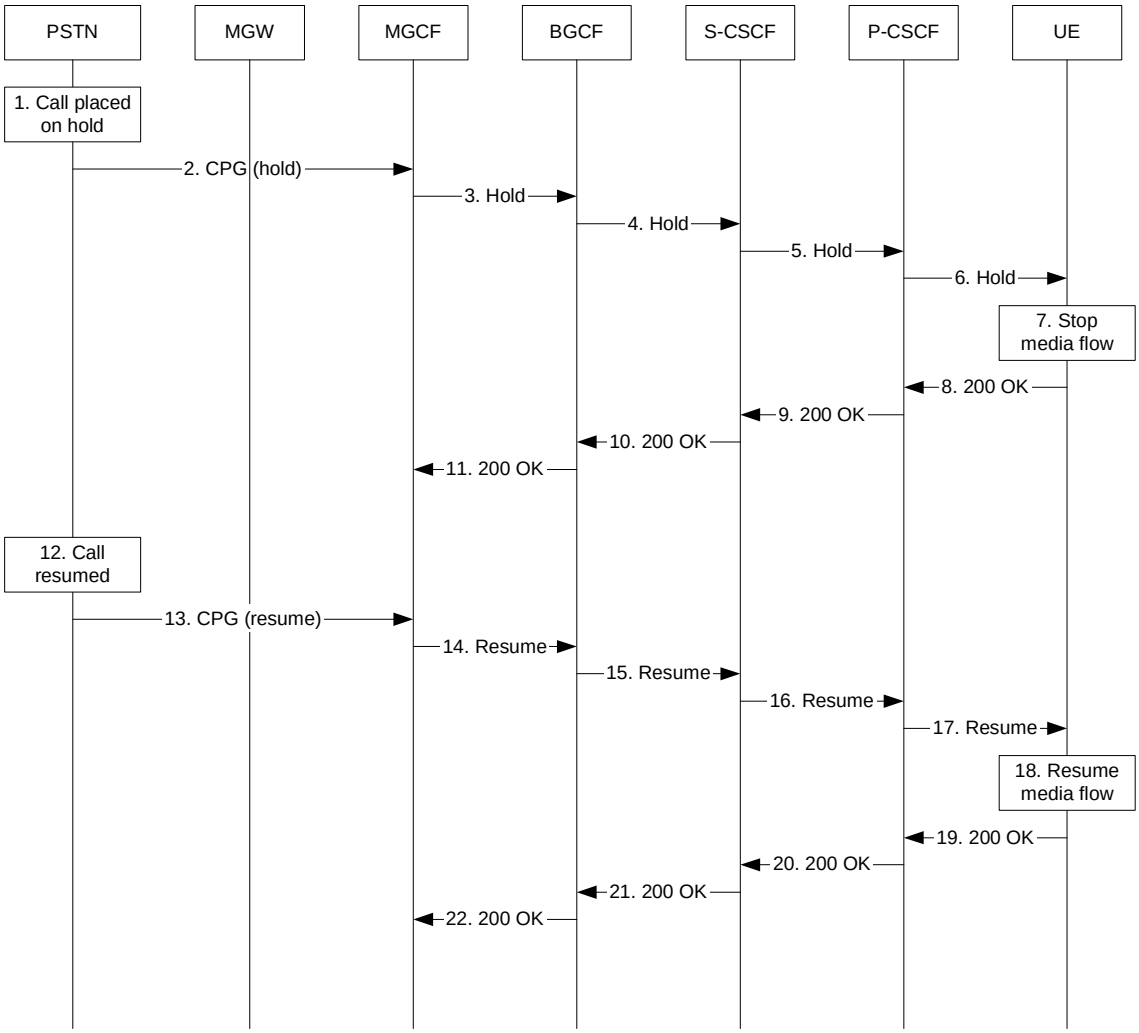


**Figure 5.29a: PSTN-initiated Hold and Resume of a Mobile-PSTN Session**

Information flow procedures are as follows:

1. The call is placed on hold in the PSTN.
2. The MGCF receives a CPG (hold) from the PSTN, which indicates that the call has been placed on hold.
3. MGCF sends a Hold message to BGCF.
4. BGCF forwards the Hold message to S-CSCF.
5. S-CSCF forwards the Hold message to P-CSCF.
6. P-CSCF forwards the Hold message to the UE.
7. UE stops sending the media stream to the remote endpoint, but keeps the resources for the session reserved.
8. The UE acknowledges receipt of the Hold message with a 200-OK final response, send to P-CSCF.
9. P-CSCF forwards the 200-OK final response to S-CSCF.
10. S-CSCF forwards the 200 OK final response to BGCF.
11. BGCF forwards the 200 OK final response to MGCF.
12. The call is resumed in the PSTN.

13. MGCF receives a CPG (resume) request from the PSTN, which indicates that the call is resumed.

14. MGCF sends a resume message to BGCF.

15. BGCF forwards the Resume message to S-CSCF.

16. S-CSCF forwards the Resume message to P-CSCF.

17. P-CSCF forwards the Resume message to UE.

18. UE resumes sending the media stream to the remote endpoint.

19. UE acknowledges receipt of the Resume message with a 200-OK final response, sent to P-CSCF.

20. P-CSCF forwards the 200 OK final response to the S-CSCF.

21. S-CSCF forwards the 200 OK final response to BGCF.

22. BGCF forwards the 200 OK final response to MGCF.

**3GPP TSG-SA WG2 Meeting #35**
**Bangkok, Thailand, 27.-31. October 2003**

***Tdoc ⌘S2-033766***

*CR-Form-v7*

# CHANGE REQUEST

⌘ **23.228** **CR** **362** ⌘**rev** **1** ⌘ Current version: **6.3.0** ⌘

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***Proposed change affects:*** UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

| | | |
|---|---|---|
| ***Title:*** | ⌘ | PSI User |
| ***Source:*** | ⌘ | Siemens |
| ***Work item code:*** | ⌘ | IMS-2 |
| ***Date:*** | ⌘ | 30/10/2003 |
| ***Category:*** | ⌘ | **C** |
| ***Release:*** | ⌘ | Rel-6 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*

| | |
|---|---|
| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | The term "PSI user" is used in TS 23.228, but a good definition or explanation is missing. |
| ***Summary of change:*** | ⌘ | Added explanation of term "PSI User". |
| ***Consequences if not approved:*** | ⌘ | TS 23.228 remains difficult to understand, which may delay stage 3 work. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 5.4.12.2, 5.4.12.4 |

| ***Other specs affected:*** ⌘ | Y | N | |
|---|---|---|---|
| | | X | Other core specifications |
| | | X | Test specifications |
| | | X | O&M Specifications |

⌘

***Other comments:*** ⌘

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

### 5.4.12.2 PSIs on the terminating side

The application server hosting the PSI may be invoked as a terminating application server with the AS and related PSIs configured in the home network, e.g. HSS. Such PSIs are globally routable and can be made available to users within and outside the operator domain, and can take the following form:

- Distinct PSIs (e.g. my_service@example.com).
- Wildcarded PSIs (chatlist_*@example.com): A range of PSIs with the same domain part in the SIP URI is defined using a wildcard indication in the userpart of the SIP-URI. Distinct PSIs can be created or deleted within the wildcarded range by the users using the Ut interface, or by the operator via O&M mechanisms.

For both the distinct PSIs and wildcarded PSIs, there are two ways to route towards the AS hosting the PSI:

a) The HSS maintains the assigned S-CSCF information and ISC Filter Criteria to route to the AS hosting the PSI according to IMS routing principles. In this case, the I-CSCF receives SIP requests at the terminating side, queries the HSS and directs the request to the S-CSCF assigned to the PSI. The S-CSCF forwards the session to the application server hosting the PSI according to the terminating ISC Filter Criteria.

b) The home database maintains the address information of the AS hosting the PSI. In this case, the AS address information for the PSI is returned to the I-CSCF in the location query response, in which case the I-CSCF will forward the request directly to the AS hosting the PSI.

In this case, the AS hosting the PSI in combination with its entry in the HSS or home database is referred to as "PSI user".

Figure 5.4.12.a depicts a routing example for incoming session where the HSS has the PSI defined in the database and then the session request is routed directly to the AS hosting the PSI.

NEXT CHANGE

### 5.4.12.4 PSI configuration in the HSS

In order to support configuration of an AS hosting a PSI in the HSS, the PSI hosted in the AS needs to be configured in the HSS. This configuration is required when the PSI has S-CSCF assigned. The configuration shall include procedures to allow:

- PSI to be configured in the HSS via operation and maintanence procedures,
- Allow authorization and verification of access as “PSI user” with the Public Service Identity assigned to the AS, e.g. for AS-originating requests,
- Allow access to “PSI user” information (e.g. the S-CSCF assigned) over the Cx reference point from the CSCF nodes,
- Allow defining the “PSI user” similar to the principle of IMS user, without requiring any subscription/access information (e.g. CS/PS domain data) that are required for IMS user.

Further functional requirements such as how S-CSCF is provisioned with the PSI data need to be studied.

Note that the PSI configuration in the HSS does not affect the filter criteria based access to AS as defined in the user profiles.

**3GPP TSG SA WG2 Meeting #35** **S2-033765**
**Bangkok, Thailand, 27th – 31st October 2003**

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# CHANGE REQUEST

⌘ **23.228** **CR** **365** ⌘**rev** **1** ⌘ Current version: **6.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

***Proposed change affects:*** UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Transfer of CSCF capability on Cx |
| ***Source:*** | ⌘ | Nortel Networks |
| ***Work item code:*** | ⌘ | IMS2 |
| ***Date:*** | ⌘ | 27/11/03 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel-6 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
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Detailed explanations of the above categories can be found in 3GPP TR 21.900.

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| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | Serving CSCF capabilities are given by the HSS to the I-CSCF so it can select an S-CSCF for the user. 23.228 says that it is the CSCF which is providing the capabilities to the HSS, which is the wrong way around. |
| ***Summary of change:*** | ⌘ | Cx reference point shall support the transfer of CSCF capability information from HSS to CSCF (and not from CSCF to HSS). |
| ***Consequences if not approved:*** | ⌘ | Misalignment with stage 3. |

| | | | | | |
|---|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 5.1.2.1 | | | |
| | | **Y** | **N** | | |
| ***Other specs affected:*** | ⌘ | | **X** | Other core specifications | ⌘ |
| | | | **X** | Test specifications | |
| | | | **X** | O&M Specifications | |
| ***Other comments:*** | ⌘ | | | | |

### 5.1.2.1 Assigning a Serving-CSCF for a user

When a UE attaches and makes itself available for access to IMS services by explicitly registering in the IMS, a S-CSCF shall be assigned to serve the UE.
The assignment of an S-CSCF is performed in the I-CSCF. The following information is needed in the selection of the S-CSCF:

1. Required capabilities for user services
   This information is provided by the HSS.

2. Operator preference on a per-user basis
   This information is provided by the HSS.

3. Capabilities of individual S-CSCFs in the home network
   This is internal information within the operator's network. This information may be used in the S-CSCF selection. This information is obtained by the I-CSCF by methods not standardised in this release.

4. Topological (i.e. P-CSCF) information of where the user is located
   This is internal information within the operator's network. This information may be used in the S-CSCF selection. The P-CSCF name is received in the registration request. The topological information of the P-CSCF is obtained by the I-CSCF by methods not standardised in Release 5.

5. Topological information of where the S-CSCF is located
   This is internal information within the operator's network. This information may be used in the S-CSCF selection. This information is obtained by the I-CSCF by methods not standardised in this release.

6. Availability of S-CSCFs
   This is internal information within the operator's network. This information may be used in the S-CSCF selection. This information is obtained by the I-CSCF by methods not standardised in this release.

In order to support the S-CSCF selection described above and to allow the S-CSCF to perform its tasks, it is required that the following types of information be transferred between the CSCF and the HSS:

1 The Cx reference point shall support the transfer of CSCF-UE security parameters from HSS to CSCF.

- This allows the CSCF and the UE to communicate in a trusted and secure way (there is no à priori trust relationship between a UE and a CSCF)

- The security parameters can be for example pre-calculated challenge-response pairs, or keys for an authentication algorithm, etc.

2 The Cx reference point shall support the transfer of service parameters of the subscriber from HSS to CSCF.

- This may include e.g. service parameters, application server address, triggers, information on subscribed media etc. The information on subscribed media is provided in the form of a profile identifier; details of the allowed media parameters associated with the profile identifier are configured in the S-CSCF.

3 The Cx reference point shall support the transfer of CSCF capability information from HSS to CSCF ~~to HSS~~.

- This may include e.g. supported service set, protocol version numbers etc.

4 The Cx reference point shall support the transfer of session signalling transport parameters from CSCF to HSS. The HSS stores the signalling transport parameters and they are used for routing mobile terminated sessions to the Serving-CSCF.

- The parameters may include e.g. IP-address and port number of CSCF, transport protocol etc.

The information mentioned in items 1 – 4 above shall be transferred before the CSCF is able to serve the mobile user. It shall also be possible to update this information while the CSCF is serving the user, for example if new services are activated for the user.

**3GPP TSG-SA WG2 Meeting #35**
**Bangkok, Thailand, 27-31 Oct 2003**

***Tdoc ⌘S2-033768***

*CR-Form-v7*

# CHANGE REQUEST

⌘ **23.228** **CR** **366** ⌘**rev** **1** ⌘ Current version: **6.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

***Proposed change affects:*** UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Support of Multi terminals |
| ***Source:*** | ⌘ | Fujitsu |
| ***Work item code:*** | ⌘ | IMS2 |
| ***Date:*** | ⌘ | 28/10/2003 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | Rel-6 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*

| | |
|---|---|
| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
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| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | SA1 has defined the service aspects of accessing IMS services with multiple terminals. The requirement has been stated in 22.228 section 5. Howere, there is lack of description on the registration reqirements needed to support the multi terminals. SIP allows one registration containing multiple contact addresses. However, this is not possible in the current release of IMS. Because each contact address (IP address) needs to have a security association with the P-CSCF, and the only procedure to establish the security association is registration. Therefore, each each contact address must register itself separatly with IMS. And this requirement needs to be stated in 23.228. |
| ***Summary of change:*** | ⌘ | One new requirement is proposed in 5.2.1 for IMS registration |
| ***Consequences if not approved:*** | ⌘ | Multi terminal is not supported |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 5.2.1 |

| | | N | | |
|---|---|---|---|---|
| ***Other specs affected:*** | ⌘ | | X | Other core specifications |
| | | | X | Test specifications |
| | | | X | O&M Specifications |

⌘

| | | |
|---|---|---|
| ***Other comments:*** | ⌘ | |

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

## 5.2 Application level registration procedures

The following sub-sections address requirements and information flows related to registration in the IP multimedia subsystem. Assumptions that apply to the various information flows are listed as appropriate.

### 5.2.1 Requirements considered for registration

The following points are considered as requirements for the purpose of the registration procedures.

1. The architecture shall allow for the Serving-CSCFs to have different capabilities or access to different capabilities. E.g. a VPN CSCF or CSCFs in different stages of network upgrade.

2. The network operator shall not be required to reveal the internal network structure to another network. Association of the node names of the same type of entity and their capabilities and the number of nodes will be kept within an operator's network. However disclosure of the internal architecture shall not be prevented on a per agreement basis.

3. A network shall not be required to expose the explicit IP addresses of the nodes within the network (excluding firewalls and border gateways).

4. It is desirable that the UE will use the same registration procedure(s) within its home and visited networks.

5. It is desirable that the procedures within the network(s) are transparent to the UE, when it register with the IM CN subsystem.

6. The Serving-CSCF is able to retrieve a service profile of the user who has IMS subscription.The Serving-CSCF knows how to reach the Proxy-CSCF currently serving the user who is registered.

7. The HSS shall support the possibility to bar a public user identity from being used for IMS non-registration procedures. The S-CSCF shall enforce these barring rules for IMS. Examples of use for the barring function are as follows:

-Currently it is required that at least one public user identity shall be stored in the ISIM application. In case the user/operator wants to prevent this public user identity from being used for IMS communications, it shall be possible to do so in the network without affecting the ISIM application directly.

8. The HSS shall support the possibility to restrict a user from getting access to IM CN Subsystem from unauthorized visited networks.

9. It shall be possible to register multiple public identities via single IMS registration procedure from the UE.

10. It shall be possible to register a Public User Identity that is simultaneously shared across multiple contact addresses via IMS registration procedures.

11. Registration of a public user identity shall not affect the status of already registered public user identity(s), unless due to requirements by Implicit Registration set defined in subclause 5.2.1a.

12. When multiple UEs share the same public identity (es), each UE shall be able to register its contact address with IMS.

**3GPP TSG-SA WG2 Meeting #36**
**New York, USA, 24.-28. November 2003**

***Tdoc ⌘S2-034329***

*CR-Form-v7*

# CHANGE REQUEST

⌘ **23.228** **CR** **368** ⌘**rev** **2** ⌘ Current version: **6.3.0** ⌘

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***Proposed change affects:*** UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Forking support in MGCF and AS |
| ***Source:*** | ⌘ | Siemens |
| ***Work item code:*** | ⌘ | IMS-2 |
| ***Date:*** | ⌘ | 27/11/2003 |
| ***Category:*** | ⌘ | **C** |
| ***Release:*** | ⌘ | Rel-6 |

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***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*
*2 (GSM Phase 2)*
*R96 (Release 1996)*
*R97 (Release 1997)*
*R98 (Release 1998)*
*R99 (Release 1999)*
*Rel-4 (Release 4)*
*Rel-5 (Release 5)*
*Rel-6 (Release 6)*

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | Support of SIP forking has been introduced in IMS with Release 6, and Release 5 already includes some support for forking occuring outside the IMS. Both requires support by the SIP user agents. Currently only the most important SIP user agent is mentioned in 23.228, namely the UE. However, the MGCF is another SIP user agent and some Application Servers may also behave as SIP user agents. |
| ***Summary of change:*** | ⌘ | Adopt the UE forking functionality for an MGCF. Include text that Application Servers that originate or terminate sessions should be capable to handle forked requests. |
| ***Consequences if not approved:*** | ⌘ | Insufficient guidance for stage 3 work. |

| | | | | | |
|---|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 4.2.7 | | | |
| | | **Y** | **N** | | |
| ***Other specs affected:*** | ⌘ | **X** | | Other core specifications | ⌘ 29.163 |
| | | | **X** | Test specifications | |
| | | | **X** | O&M Specifications | |
| ***Other comments:*** | ⌘ | | | | |

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## 4.2.7 Support of SIP forking

### 4.2.7.1 SIP Forking

SIP forking is the ability of a SIP proxy server to fork SIP request messages to multiple destinations according to RFC 3261 [12].

### 4.2.7.2 Forking within and outside the IM CN Subsystem

The IM CN subsystem shall have the capability to fork requests to multiple destinations; this capability is subject to rules for forking proxies defined in RFC 3261 [12].

- The S-CSCF shall support the ability for a public user identity to be registered from multiple contact addresses, as defined in RFC 3261 [12]. The S-CSCF shall support forking so that an incoming SIP request addressed to a Public User Identity is proxied to multiple registered contact addresses. This allows forking across multiple contact addresses of the same Public User Identity.

- Application Servers in the IMS may act as a forking proxy in the sense of RFC 3261 [12] and may fork a SIP request across multiple Public User Identities allocated to the same user. S-CSCFs shall provide the necessary support for forking by Application Servers.

Additionally, other networks outside the IM CN Subsystem are able to perform SIP forking.

### 4.2.7.3 Support for forked requests

UE~~s~~ and MGCF shall be ready to receive responses generated due to a forked request and behave according to the procedures specified in [12] and in this section.

The UE and MGCF may accept or reject early dialogues from different terminations as described in [12], for example if the UE is only capable of supporting a limited number of simultaneous dialogs.

Upon the reception of a first final 200 OK (for INVITE), the ~~UE~~ UE or MGCF shall acknowledge the 200 OK and cancel other early dialogues that may have been established. In this case t~~T~~he UE or MGCF may require updating the allocated resources according to the resources needed. In case ~~the UE~~it receives a subsequent 200 OK, the UE or MGCF shall acknowledge the dialogue and immediately send a BYE to drop the dialog.

The UE and MGCF may~~shall be able to~~ include preferences, in INVITE's, indicating that proxies should not fork the INVITE request.

On the terminating side, ~~a~~ UE and MGCF shall be able to receive, as specified in [12], several requests for the same dialog that were forked by a previous SIP entity.

Application Servers and MRFCs shall be capable to handle forked requests according to the procedures specified in [12].

**3GPP TSG-SA WG2 Meeting #36**
**New York, USA, 24-28 November 2003**

***Tdoc ⌘S2-034383***

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# CHANGE REQUEST

⌘ **23.228** **CR** **369** ⌘**rev** **3** ⌘ Current version: **6.3.0** ⌘

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***Proposed change affects:*** UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Application Server originated requests |
| ***Source:*** | ⌘ | Nokia |
| ***Work item code:*** | ⌘ | IMS2 |
| ***Date:*** | ⌘ | 04/12/2003 |
| ***Category:*** | ⌘ | **B** |
| ***Release:*** | ⌘ | Rel-6 |

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***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
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| | |
|---|---|
| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | The current stage-2 specification allows for Application Servers to originate requests, however, descriptions suggest that this is only applied on the terminating side. To provide full flexibility to services over IMS, the capability of allowing ASs to originate requests on behalf of users should be introduced. This implies adding the architectural capability for ASs to generate requests on the origination side. |
| ***Summary of change:*** | ⌘ | Text has been added introducing the support for Application Server to generate SIP requests and dialogs on behalf of users on the origination side. |
| ***Consequences if not approved:*** | ⌘ | |

| | | | | | |
|---|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 4.2.4 | | | |
| | | **Y** | **N** | | |
| ***Other specs affected:*** | ⌘ | | **X** | Other core specifications | ⌘ |
| | | | **X** | Test specifications | |
| | | | **X** | O&M Specifications | |
| ***Other comments:*** | ⌘ | | | | |

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## 4.2.4 IP multimedia Subsystem Service Control Interface (ISC)

The ISC interface is between the Serving CSCF and the service platform(s).

An Application Server (AS) offering value added IM services resides either in the user's home network or in a third party location. The third party could be a network or simply a stand-alone AS.

The Serving-CSCF to AS interface is used to provide services residing in an AS. Two cases were identified:

- Serving-CSCF to an AS in Home Network.

- Serving-CSCF to an AS in External Network (e.g., Third Party or Visited)

The SIP Application Server may host and execute services. The SIP Application Server can influence and impact the SIP session on behalf of the services and it uses the ISC interface to communicate with the S-CSCF.

The S-CSCF shall decide whether an Application Server is required to receive information related to an incoming SIP session request to ensure appropriate service handling.. The decision at the S-CSCF is based on (filter) information received from the HSS. This filter information is stored and conveyed on a per application server basis for each user. The name(s)/address(es) information of the application server(s) are received from the HSS.

The S-CSCF does not handle service interaction issues.

Once the IM SSF, OSA SCS or SIP Application Server has been informed of a SIP session request by the S-CSCF, the IM SSF, OSA SCS or SIP Application Server shall ensure that the S-CSCF is made aware of any resulting activity by sending messages to the S-CSCF.

From the perspective of the S-CSCF, The “SIP Application server”, “OSA service capability server” and “IM-SSF” shall exhibit the same interface behaviour.

When the name/address of more than one “application server” is transferred from the HSS, the S-CSCF shall contact the “application servers” in the order supplied by the HSS. The response from the first “application server” shall be used as the input to the second “application server”. Note that these multiple “application servers” may be any combination of the SIP Application server, OSA service capability server, or IM-SSF types.

The S-CSCF does not provide authentication and security functionality for secure direct third party access to the IM subsystem. The OSA framework provides a standardized way for third party secure access to the IM subsystem.

If a S-CSCF receives a SIP request on the ISC interface that was originated by an Application Server destined to a user served by that S-CSCF, then the S-CSCF shall treat the request as a terminating request to that user and provide the terminating request functionality as described above. Both registered and unregistered terminating requests shall be supported.

It shall be possible for an Application Server to generate SIP requests and dialogs on behalf of users. Such requests are forwarded to the S-CSCF serving the user, and the S-CSCF shall perform regular originating procedures for these requests.

Editor’s note: The detailed procedures for handling such requests (e.g. security, charging, routing, etc…) are FFS.

More specifically the following requirements apply to the IMS Service control interface:

1. The ISC interface shall be able to convey charging information as per 3GPP TS 32.200[25] and 3GPP TS 32.225[26]..

2. The protocol on the ISC interface shall allow the S-CSCF to differentiate between SIP requests on Mw, Mm and Mg interfaces and SIP Requests on the ISC interface.

**Figure 4.3: Void**

Besides the Cx interface the S-CSCF supports only one standardised protocol for service control, which delegates service execution to an “Application Server”. The protocol to be used on the ISC interface shall be SIP (as defined by RFC 3261 [12], other relevant RFC’s, and additional enhancements introduced to support 3GPP´s needs on the Mw, Mm, Mg interfaces). On the ISC interface, extensions to SIP shall be avoided but are not expressly prohibited.

The notion of a "SIP leg" used throughout this specification is identical to the notion of a call leg which is the same as a SIP dialog defined by RFC 3261 [12]. The same SIP leg that is received by the S-CSCF on the Mw, Mm and Mg interfaces is sent on the ISC interface. The same SIP leg that is received by the S-CSCF on the ISC interface is sent on the Mw, Mm and Mg interfaces.

Concerning the relationship between the SIP legs of the ISC interface and the SIP legs of the Mw, Mm, and Mg interfaces the S-CSCF acts as a SIP proxy, as shown in Figures 4.a-4e below.

Figures 4.3a-4.3e below depict the possible high-level interactions envisioned between the S-CSCF and the Application Server.

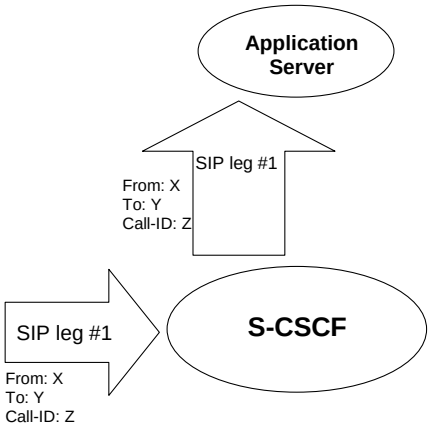


**Figure 4.3a: Application Server acting as terminating UA, or redirect server**

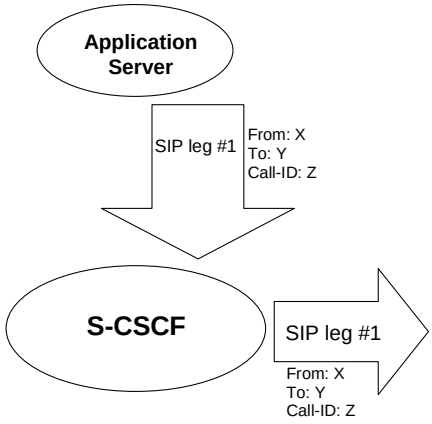


**Figure 4.3b: Application Server acting as originating UA**

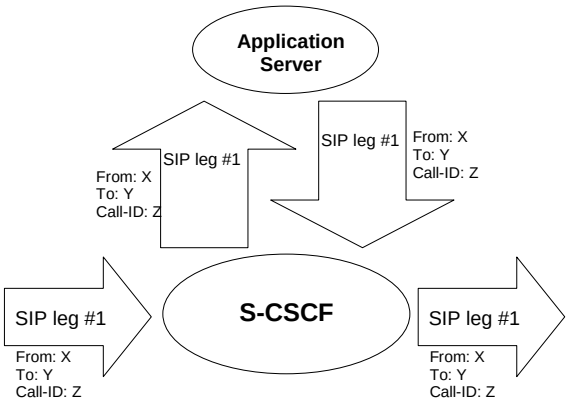


**Figure 4.3c: Application Server acting as a SIP proxy**

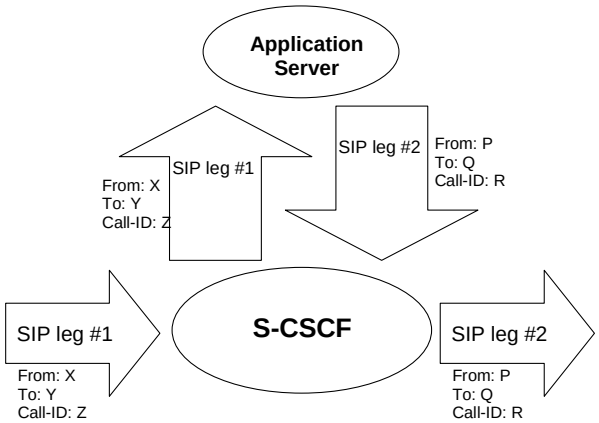


**Figure 4.3d: Application Server performing 3rd party call control**

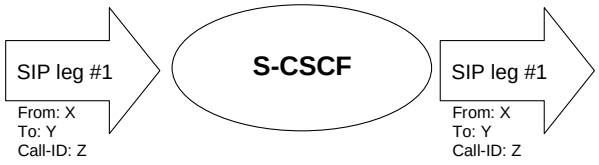


**Figure 4.3e: A SIP leg is passed through the S-CSCF without Application Server involvement**

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**New York, USA, 24-28 November 2003**

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# CHANGE REQUEST

⌘ **23.228** **CR** **371** ⌘**rev** **2** ⌘ Current version: **6.3.0** ⌘

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***Proposed change affects:*** UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Requirements for IM CN Subsystem signalling flag |
| ***Source:*** | ⌘ | Nortel Networks |
| ***Work item code:*** | ⌘ | IMS2 |
| ***Date:*** | ⌘ | 24/11/2003 |
| ***Category:*** | ⌘ | **B** |
| ***Release:*** | ⌘ | Rel-6 |

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|---|---|
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| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | A network with Bearer Flow charging capabilities (as introduced in release 6) allow operators to have more flexible way of providing services like filters and more enhanced charging capabilities.<br><br>The rel6 Flow Bearer charging requirements need to be documented in a more generic way as the ability to apply a special rating to at least SIP, DHCP, DNS and HTTP traffic. This can be achieved by a release 6 network that provides Bearer flow charging capabilities, with or without the UE including the IM CN Subsystem signalling flag. |
| ***Summary of change:*** | ⌘ | Addition of IP Flow charging capabilities as an alternative mechanism to the concept of dedicated PDP context signalling. |
| ***Consequences if not approved:*** | ⌘ | |

| | | | | | | |
|---|---|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 4.2.6, E.2.1 | | | | |
| ***Other specs affected:*** | ⌘ | **Y** | **N** | | | |
| | | **X** | | Other core specifications | ⌘ | 23.207 |
| | | | **X** | Test specifications | | |
| | | | **X** | O&M Specifications | | |
| ***Other comments:*** | ⌘ | | | | | |

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********** First Amended Section **********

### 4.2.6 QoS Requirements for IM CN subsystem signalling

The UE shall be able to establish a dedicated signalling IP-CAN bearer for IM Subsystem related signalling or utilize a general-purpose IP-CAN bearer for IM subsystem signalling traffic.

The use of a dedicated signalling IP-CAN bearer for IM Subsystem related signalling may provide enhanced QoS for signalling traffic.

If a dedicated signalling IP-CAN bearer is to be used for IM Subsystem related signalling, rules and restrictions may apply to the bearer according to operator implementation. A set of capabilities shall be standardised to provide user experience consistency and satisfy user expectation. The rules and restrictions on other capabilities beyond the standardised set are configured by the operator in the IP-CAN.

To enable the described mechanism to work without requiring end-user interaction and under roaming circumstances, it is a requirement for the UE to be made aware of the rules and restrictions applied by the visited network operator. As there is as yet no mechanism available in this Release for providing the information about the restrictions back to the UE, the available set of rules and restrictions in this Release is the set of capabilities as defined below.

The dedicated signalling IP-CAN bearer is subject to restrictions, the capabilities to be applied are defined as follows: all messages from the UE that use a dedicated signalling IP-CAN bearer shall have their destination restricted to:

-the P-CSCF assigned for this UE, or to any one of the set of possible P-CSCFs that may be assigned to this UE

-and towards DHCP and DNS servers within the IMS operator's domain where the P-CSCF is located.

The UE is not trusted to implement these restrictions, therefore the restrictions are enforced in the IP-CAN by the operator.

The IP-CAN shall be able to apply rules and restrictions for the IM CN subsystem traffic. In particular, the IP-CAN shall be able to identify IM CN subsystem signalling traffic in order for the operator to decide on what particular rating to apply to the IM CN subsystem signalling traffic. This includes the ability to apply a special rating to at least SIP, DHCP, DNS and HTTP traffic for IMS.

********** Next Amended Section **********

# E.2 QoS related concepts

## E.2.1 Application Level Signalling for IMS

When the UE uses GPRS-access for IMS services, it shall be able to establish a dedicated signalling PDP-Context for IM Subsystem related signalling or utilize a general-purpose PDP context for IM subsystem signalling traffic.

### E.2.1.1 QoS Requirements for Application Level Signalling

The UE shall be able to request prioritised handling over the radio for IM Subsystem related signalling by including the Signalling Indication in the QoS IE of the PDP Context to be used for this traffic as described in TS 23.207.

### E.2.1.2 Requirements for IM CN subsystem signalling flag

The IM CN Subsystem Signalling flag is used to indicate the dedicated signalling PDP context for IMS– signalling. If the network operator does not support a dedicated signalling PDP context or the UE does not include the IM CN Subsystem Signalling flag, the network will consider the PDP context as a general purpose PDP context.

A dedicated signalling PDP context provides dedicated IP-Connectivity Access Network bearers for IM CN subsystem signalling traffic, hence architectural requirements described in clause 4.2.6 for the usage of dedicated bearer resources shall be applied. The UE is not trusted to implement these restrictions, therefore the restrictions are enforced in the GGSN by the operator of the GGSN.

IP Flow based Charging functionality can be used to provide additional charging capabilities for dedicated signalling PDP context used for IMS signalling (as well as for a general-purpose PDP context) as described in section 4.2.6.

Whether the network is configured to support IM CN signalling flag or IP Flow based charging functionality or both, is dependent on the operator configuration policy.

### E.2.1.3 Application Level Signalling support for IMS services

In order to receive different level of support for application level signalling in a PDP context, the UE may choose one of the following options:

- Include both the IM CN Subsystem Signalling Flag in the PCO IE and the Signalling Indication in the QoS IE in PDP context activation procedure. This indicates to the network (radio & core) the requirement of using the PDP context for application level signalling after it has been negotiated with the networks, to provide prioritised handling over the radio interface (as described in sub clause E.2.1.1), with rules and restrictions applied in the network (as described in sub clause E.2.1.2).

- Include the IM CN Subsystem Signalling Flag in the PCO IE in the PDP context activation procedure. This indicates to the GPRS network the requirement of using PDP context for application level signalling with restricted handling as described in sub clause E.2.1.2, after it has been negotiated with the networks.

- Utilize a general purpose PDP Context with a negotiated QoS profile (this includes the possibility of having the sSignalling Iindication in the QoS IE).

The IM CN Subsystem signalling flag is used to reference rules and restrictions on the PDP context used for application level signalling, as described in section E.2.2.

The Signalling Indication in QoS IE provides prioritised handling over the radio interface and is detailed in 3GPP TS 23.107 & 3GPP TS 23.207.

Depending on the operator's policy, one or more of the above combinations may be allowed in the GPRS network.

## E.2.1a PDP context procedures for IMS

### E.2.1a.1 Establishing PDP Context for IM CN Subsystem Related Signalling

It shall be possible for the UE to convey to the network the intention of using the PDP context for IM Subsystem related signalling. For this purpose it uses the mechanism for 'PDP Context Used for Application Level Signalling Transport' as described in TS23.207 & Application Level Signalling in ssub clauses E.2.1.1, E.2.1.2 & E.2.1.3.

A IM CN Subsystem signalling flag determines any rules and restrictions that shall apply at the GGSN for that PDP context, these rules and restrictions are described in section 4.2.6. It shall not be possible to modify a general purpose PDP context into a dedicated PDP context for IM Subsystem related signalling and vice versa.

The IM CN subsystem signalling flag and the Signalling Indication in the QoS IE may be used independently of each other.

### E.2.1a.2 Deletion of PDP Context used to transport IMS SIP signalling

In case the GPRS subsystem deletes the PDP Context used to transport IMS SIP signalling, then according to clause 5.10.3.0 the UE shall initiate a procedure to re-establish a PDP Context for IMS signalling transport. If there are any IMS related PDP contexts active, the re-establishment of the PDP context to transport IMS signalling shall be performed by using the Secondary PDP Context Activation Procedure as defined in TS 23.060 [23].

**3GPP TSG-SA WG2 Meeting #36**
**USA, New York, 24-28 Nov 2003**

***Tdoc ⌘S2-034332***

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# CHANGE REQUEST

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***Proposed change affects:*** UICC apps⌘ [X] ME [ ] Radio Access Network [ ] Core Network [X]

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Terminal Capability with Registration |
| ***Source:*** | ⌘ | Fujitsu, Nokia, Ericsson |
| ***Work item code:*** | ⌘ | IMS2 |
| ***Date:*** | ⌘ | 19/11/2003 |
| ***Category:*** | ⌘ | **C** |
| ***Release:*** | ⌘ | Rel-6 |

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| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | In 22.228(IMS stage 1) , it has the following requirement:<br>"It shall be possible to support the multiple UEs associated with a single IMS service subscription. It shall be possible to share one Public User Identity between multiple UEs. It shall also be possible to identify the individual UEs with separate Public User Identities. IMS shall be able to route sessions towards the identified UE(s), e.g. based on UE capability, User preference and/or Network preferences."<br><br>The callee capabilities work in IETF outlines a mechanism how SIP User Agent capabilities can be indicated. Hence, it presents a rather straightforward solution to fullfill the requirement described above. |
| ***Summary of change:*** | ⌘ | The mechanism to indicate SIP User Agent capabilities upon IMS registration is porposed to be added. |
| ***Consequences if not approved:*** | ⌘ | |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 2, 5.2.1 |

| | | Y | N | | |
|---|---|---|---|---|---|
| ***Other specs affected:*** | ⌘ | | X | Other core specifications | ⌘ |
| | | | X | Test specifications | |
| | | | X | O&M Specifications | |

| | | |
|---|---|---|
| ***Other comments:*** | ⌘ | |

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

********** First change **********

# 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 TS 23.002: "Network Architecture".

[2] CCITT Recommendation E.164: "Numbering plan for the ISDN era".

[3] CCITT Recommendation Q.65: "Methodology – Stage 2 of the method for the characterisation of services supported by an ISDN".

[4] ITU Recommendation I.130: "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN"

[5] GSM 03.64: "Digital cellular telecommunication system (Phase 2+); Overall Description of the General Packet Radio Service (GPRS) Radio Interface; Stage 2".

[6] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[7] 3GPP TS 23.221: "Architectural Requirements".

[8] 3GPP TS 22.228: "Service requirements for the IP multimedia core network subsystem"

[9] 3GPP TS 23.207: "End-to-end QoS concept and architecture"

[10] 3GPP TS 24.228: "Signalling flows for the IP multimedia call control based on SIP and SDP"

[10a] 3GPP TS 24.229: " IP Multimedia Call Control based on SIP and SDP; Stage 3"

[11] 3GPP TS 25.301: "Radio interface protocol architecture"

[11a] 3GPP TS 29.207: " Policy control over Go interface "

[12] RFC 3261: "SIP: Session Initiation Protocol"

[13] RFC 2396: "Uniform Resource Identifiers (URI): Generic Syntax"

[14] RFC 2486: "The Network Access Identifier"

[15] RFC 2806: "URLs for Telephone Calls"

[16] RFC 2916: "E.164 number and DNS"

[16a] RFC 3041: "Privacy Extensions for Stateless Address Autoconfiguration in IPv6"

[17] ITU Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies"

[18] ITU Recommendation H.248: "Gateway control protocol"

[19] 3GPP TS 33.203: "Access Security for IP-based services"

[20] 3GPP TS 33.210: "Network Domain Security: IP network layer security "

[21] 3GPP TS 26.235: "Packet Switched Multimedia Applications; Default Codecs".

[22] 3GPP TR 22.941: " IP Based Multimedia Services Framework "

[23] 3GPP TS 23.060: “General Packet Radio Service (GPRS); Service description; Stage 2

[24] 3GPP TS 23.003: “Technical Specification Group Core Network; Numbering, addressing and identification”

[25] 3GPP TS 32.200: “Telecommunication management; Charging management; Charging principles”

[26] 3GPP TS 32.225: ” Telecommunication Management; Charging Management; Charging Data Description for IP Multimedia Subsystem”

[27] 3GPP TS 22.071: “Technical Specification Group Services and System Aspects,Location Services (LCS);Service description, Stage 1”

[28] 3GPP TS 23.271: “Technical Specification Group Services and System Aspects, Functional stage 2 description of LCS”

[29] 3GPP TS 23.078: “Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3 - Stage 2”

[29a] 3GPP TS 22.340: “ IMS Messaging; Stage 1”

[30] 3GPP TS 29.228:“IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents”

[31] 3GPP TS 23.240: "3GPP Generic User Profile - Architecture; Stage 2"

[32] 3GPP TS 22.250: “IP Multimedia Subsystem (IMS) group management”; Stage 1”

[33] RFC 2766: “Network Address Translation-Protocol Translation (NAT-PT)”

[34] RFC 2663: “IP Network Address Translator (NAT) Terminology and Considerations”

[35] Transition Scenarios for 3GPP Networks, draft-ietf-v6ops-3gpp-cases-03.txt, work in progress

[36] 3GPP TS 23.141: “Technical Specification Group Services and System Aspects, Presence Service”

[37] 3GPP TS 26.xxx:” IMS messaging and Presence; Media formats and codecs”

[xx] draft-ietf-sip-callee-caps-01 (October 2003): "Indicating User Agent Capabilities in the Session Initiation Protocol (SIP)"

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

********** Second change **********

## 5.2.1 Requirements considered for registration

The following points are considered as requirements for the purpose of the registration procedures.

1. The architecture shall allow for the Serving-CSCFs to have different capabilities or access to different capabilities. E.g. a VPN CSCF or CSCFs in different stages of network upgrade.

2. The network operator shall not be required to reveal the internal network structure to another network. Association of the node names of the same type of entity and their capabilities and the number of nodes will be kept within an operator’s network. However disclosure of the internal architecture shall not be prevented on a per agreement basis.

3. A network shall not be required to expose the explicit IP addresses of the nodes within the network (excluding firewalls and border gateways).

4. It is desirable that the UE will use the same registration procedure(s) within its home and visited networks.

5. It is desirable that the procedures within the network(s) are transparent to the UE, when it register with the IM CN subsystem.

6. The Serving-CSCF is able to retrieve a service profile of the user who has IMS subscription.The Serving-CSCF knows how to reach the Proxy-CSCF currently serving the user who is registered.

7. The HSS shall support the possibility to bar a public user identity from being used for IMS non-registration procedures. The S-CSCF shall enforce these barring rules for IMS. Examples of use for the barring function are as follows:

-Currently it is required that at least one public user identity shall be stored in the ISIM application. In case the user/operator wants to prevent this public user identity from being used for IMS communications, it shall be possible to do so in the network without affecting the ISIM application directly.

8. The HSS shall support the possibility to restrict a user from getting access to IM CN Subsystem from unauthorized visited networks.

9. It shall be possible to register multiple public identities via single IMS registration procedure from the UE.

10. It shall be possible to register a Public User Identity that is simultaneously shared across multiple contact addresses via IMS registration procedures.

11. Registration of a public user identity shall not affect the status of already registered public user identity(s), unless due to requirements by Implicit Registration set defined in subclause 5.2.1a.

12. The UE may indicate its capabilities and characteristics in terms of SIP User Agent capabilities and characteristics described in "draft-ietf-sip-callee-caps-01" [xx] during IMS registration.

**3GPP TSG-SA2 Meeting #36** ***Tdoc S2-034300***
**New York, U.S.A, 24th – 28th November, 2003**

*CR-Form-v7*

# CHANGE REQUEST

⌘ **23.228** **CR** **379** ⌘**rev** **1** ⌘ Current version: **6.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

***Proposed change affects:*** UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

| | | |
|---|---|---|
| ***Title:*** | ⌘ | HSS as database for the PSI handling |
| ***Source:*** | ⌘ | Ericsson |
| ***Work item code:*** | ⌘ | IMS2 |
| ***Date:*** | ⌘ | 26/11/2003 |
| ***Category:*** | ⌘ | **C** |
| ***Release:*** | ⌘ | Rel-6 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*
*2 (GSM Phase 2)*
*R96 (Release 1996)*
*R97 (Release 1997)*
*R98 (Release 1998)*
*R99 (Release 1999)*
*Rel-4 (Release 4)*
*Rel-5 (Release 5)*
*Rel-6 (Release 6)*

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | PSI functionality was included in the IMS architecture mentioning “database” as a general database instead of making use of the HSS. |
| ***Summary of change:*** | ⌘ | home database is replaced by HSS in all cases where IMS principles applies |
| ***Consequences if not approved:*** | ⌘ | Unspecified home database concept, leading to no clear stage 2 guidelines for stage 3 |

| | | | | | | |
|---|---|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 5.4.12.2 | | | | |
| | | **Y** | **N** | | | |
| ***Other specs affected:*** | ⌘ | **X** | | Other core specifications | ⌘ | 29.228 |
| | | | **X** | Test specifications | | |
| | | | **X** | O&M Specifications | | |
| ***Other comments:*** | ⌘ | | | | | |

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

-- Begin modified section --

## 5.4.12 Configuration and Routing principles for Public Service Identities

Depending on the service nature, different mechanisms may be used for configuration and routing of PSIs according to operator preference.

When PSIs are created, the uniqueness of a PSI shall be ensured.

Whenever possible, routing to/from a Public Service Identity (PSI) should be provided using basic principles used for IMS routing.

### 5.4.12.1 PSIs on the originating side

The application server hosting the PSI may be invoked as an originating application server. This can be achieved by modifying the filter information within the subscription information of the users intending to use the service identified by the PSI. The PSI is then made available to these users.

The SIP requests are directed to the corresponding application server hosting the service according to the originating filtering rules in the S-CSCF of the user who is using the service.

Such statically pre-configured PSIs are only available internally within IMS of the operator's domain.

### 5.4.12.2 PSIs on the terminating side

The application server hosting the PSI may be invoked as a terminating application server with the AS and related PSIs configured in the home network, e.g. HSS. Such PSIs are globally routable and can be made available to users within and outside the operator domain, and can take the following form:

- Distinct PSIs (e.g. my_service@example.com).
- Wildcarded PSIs (chatlist_*@example.com): A range of PSIs with the same domain part in the SIP URI is defined using a wildcard indication in the userpart of the SIP-URI. Distinct PSIs can be created or deleted within the wildcarded range by the users using the Ut interface, or by the operator via O&M mechanisms.

For both the distinct PSIs and wildcarded PSIs, there are two ways to route towards the AS hosting the PSI:

a) The HSS maintains the assigned S-CSCF information and ISC Filter Criteria to route to the AS hosting the PSI according to IMS routing principles. In this case, the I-CSCF receives SIP requests at the terminating side, queries the HSS and directs the request to the S-CSCF assigned to the PSI. The S-CSCF forwards the session to the application server hosting the PSI according to the terminating ISC Filter Criteria.

b) The ~~home database~~ HSS maintains the address information of the AS hosting the PSI. In this case, the AS address information for the PSI is returned to the I-CSCF in the location query response, in which case the I-CSCF will forward the request directly to the AS hosting the PSI.

Figure 5.4.12.a depicts a routing example for incoming session where the ~~HSS has the PSI defined in the database and then the~~ session request is routed directly to the AS hosting the PSI.

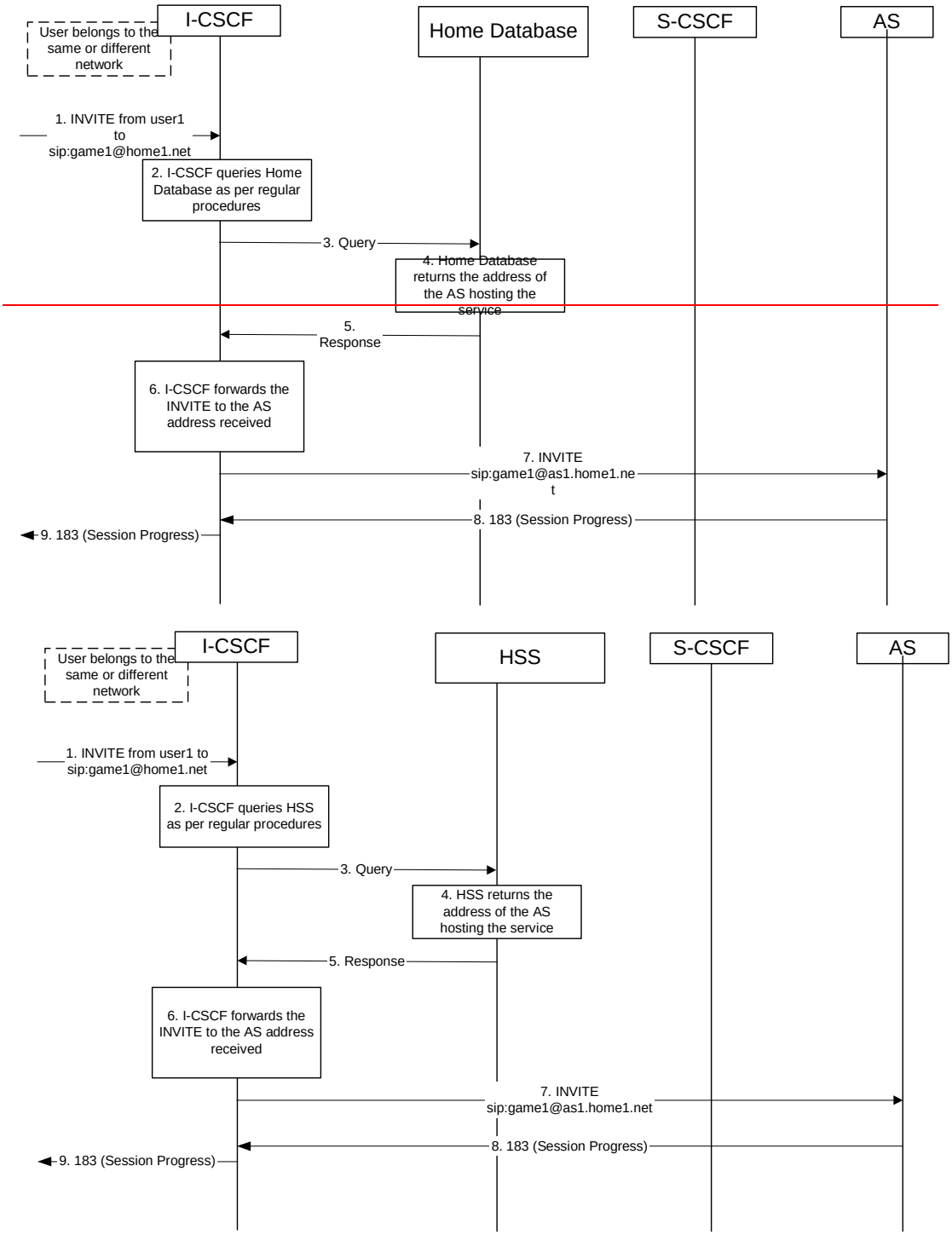


**Figure 5.4.12.a Incoming session, direct route towards the AS**

1. I-CSCF receives a request destined to the PSI.

2-3. I-CSCF queries ~~Home Database~~the HSS in order to determine the next hop in the routing path for the PSI.

4. ~~Home database~~HSS determines the routing information, i.e., the address of the AS hosting the PSI.

5. ~~Home database~~HSS returns the AS address to the I-CSCF.

6-7. I-CSCF forwards the request to the address received from the query.

8-9. Session setup completes as per existing procedures.

Figure 5.4.12.b depicts an example routing scenario where the basic IMS routing via S-CSCF is used to route the session.

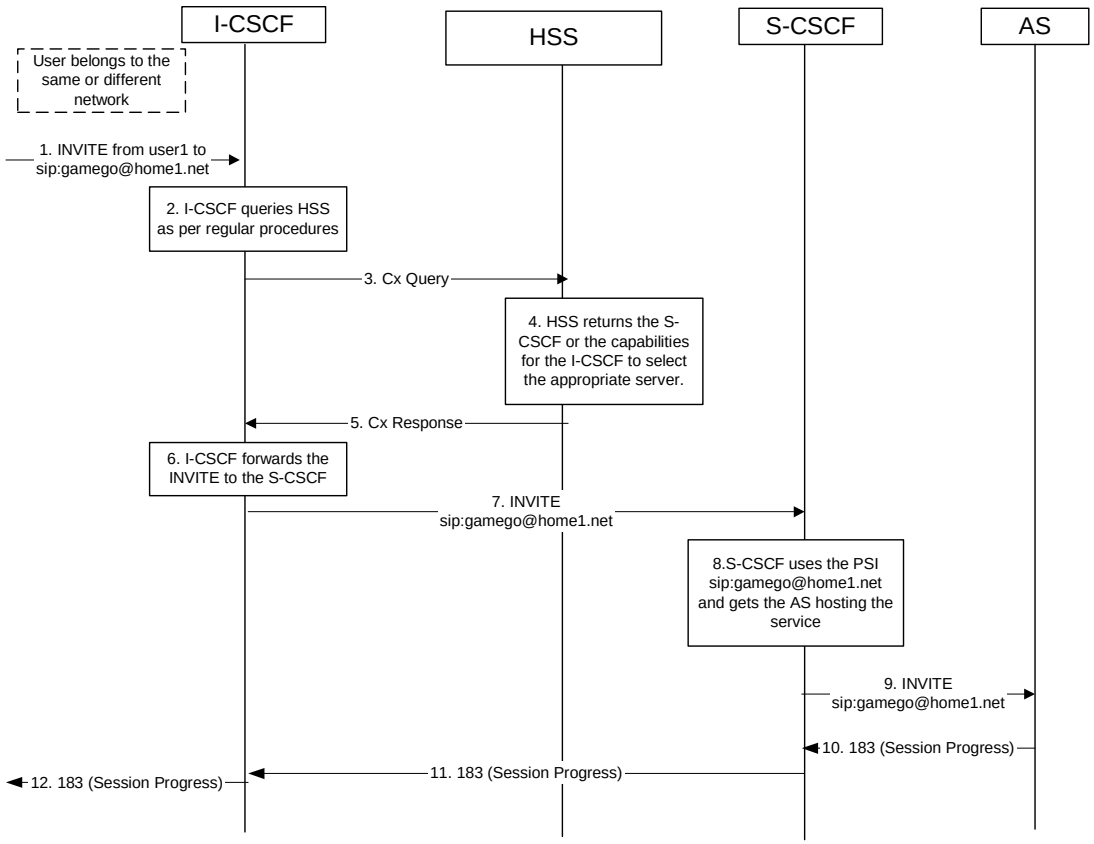


**Figure 5.4.12.b Incoming session, indirect route to AS via S-CSCF**

1. I-CSCF receives a request destined to the PSI.

2-3. I-CSCF queries HSS in order to determine the next hop in the routing path for the PSI.

4. HSS determines the routing information, which is the S-CSCF defined for the AS hosting the PSI.

5. HSS returns the S-CSCF address/capabilities to the I-CSCF.

6-7. I-CSCF, as per existing procedures, forwards the request towards the entity (i.e., S-CSCF) received from the query, or the I-CSCF selects a new S-CSCF if required.

8. S-CSCF evaluates the filter criteria and gets the AS address where to forward the request.

9. The request is then routed towards the AS identified by the filter criteria.

10-12. Session setup completes as per existing procedures.

### 5.4.12.3 Subdomain based PSIs on the originating and terminating side

Subdomains defined for PSIs allow both operators and users to define these PSIs for specific applications. For this purpose, subdomains are defined in the DNS infrastructure. Within the subdomain, specific PSIs can be created either statically or dynamically.

Subdomain based PSIs are globally routable and can be made available to users within and outside the operator domain.

In this case, there are two ways to route towards the AS hosting the PSI:

a) When the subdomain name is defined in the global DNS, then the originating S-CSCF receives the IP address of the AS hosting the PSI, when it queries DNS. The principles defined in RFC 3263 “Session Initiation Protocol (SIP): Locating SIP Servers” may be used. For example, a NAPTR query and then a SRV query may be used to get the IP address of the AS.

b) The PSI is resolved by the global DNS to an I-CSCF address in the domain where the AS hosting the PSI is located. The I-CSCF recognises the subdomain (and thus does not query the HSS). It resolves the same PSI to the address of the actual destination AS hosting the PSI using an internal DNS mechanism, and forwards the requests directly to the AS.

Figure 5.4.12.c shows an example of DNS based routing of an incoming session from an external network. The routing from the external network leads to the entry point of the IMS subsystem hosting the subdomain of the PSI.

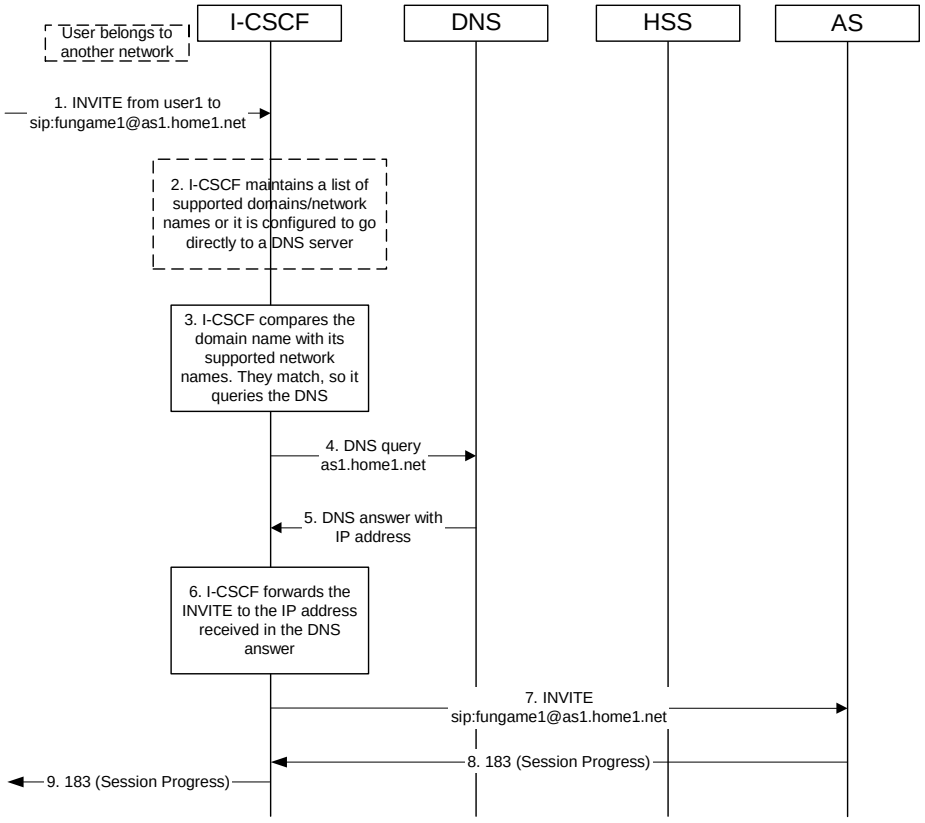


**Figure 5.4.12.c Incoming session, direct route to AS using DNS**

1. I-CSCF receives a request that is destined tothe PSI.

2. I-CSCF has been configured with the list of supported domains/network names, or it may have been configured to directly query a local DNS server.

3. In this case the I-CSCF checks the list and finds a match.

4. I-CSCF sends DNS query to find the route.

5. DNS server returns the IP address of the AS hosting the PSI.

6-7. I-CSCF forwards the request towards the IP address received from the query.

8-9. Session setup completes as per existing procedures.

### 5.4.12.4 PSI configuration in the HSS

In order to support configuration of an AS hosting a PSI in the HSS, the PSI hosted in the AS needs to be configured in the HSS. This configuration is required when the PSI has S-CSCF assigned. The configuration shall include procedures to allow:

- PSI to be configured in the HSS via operation and maintanence procedures,
- Allow authorization and verification of access as “PSI user” with the Public Service Identity assigned to the AS,
- Allow access to “PSI user” information (e.g. the S-CSCF) over the Cx reference point from the CSCF nodes,
- Allow defining the “PSI user” similar to the principle of IMS user, without requiring any subscription/access information (e.g. CS/PS domain data) that are required for IMS user.

Further functional requirements such as how S-CSCF is provisioned with the PSI data need to be studied.

Note that the PSI configuration in the HSS does not affect the filter criteria based access to AS as defined in the user profiles.

### 5.4.12.5 Requests originated by the AS hosting the PSI

The AS hosting the PSI may originate requests with the PSI as the originating party. For such originating requests, the home IMS network shall be capable to perform the following functions:

- In case network configuration hiding is to be applied, the request shall be routed as per the principles described in sub-clause 4.6.2.1. This means that the last hop within the originating IMS is an I-CSCF (THIG), which processes the request further on and routes it towards the destination network.
- Network Domain Security [20] shall be used where applicable.
- Charging requirements such as providing appropriate accounting and charging functions via the charging entities shall be supported according to 3GPP TS 32.200 [25].
- In case the target identity is a tel: URL, ENUM translation needs to be performed, and the request shall be routed based on the translation result.

Routing from the Originating AS hosting the PSI can be performed as follows:

a) The AS may forward the originating request to the destination network without involving a S-CSCF. If this option is applied where the target identity is a tel: URL, the AS performs an ENUM query and routes the request based on the translation result. ENUM support for an AS is optional. If an AS does not support ENUM, it shall be configured to use b) at least in case of tel: URLs.

b) In case the PSI has a S-CSCF assigned, the AS forwards the originating request to this S-CSCF, which then processes the request as per regular originating S-CSCF procedures.

To prevent fraudulent or unsecure IMS traffic possibly caused by AS originated requests, security and authentication procedures may be performed towards the AS.

## -- End modified section --

**3GPP TSG-SA WG2 Meeting #36** **Tdoc S2-034301**
**New York, U.S.A, 24th – 28th November, 2003**

CR-Form-v7

# CHANGE REQUEST

⌘ **23.228** **CR** **380** ⌘**rev** **1** ⌘ Current version: **6.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

***Proposed change affects:*** UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

| | | |
|---|---|---|
| ***Title:*** | ⌘ | PSI corrections |
| ***Source:*** | ⌘ | Ericsson |
| ***Work item code:*** | ⌘ | IMS2 |
| ***Date:*** | ⌘ | 26/11/2003 |
| ***Category:*** | ⌘ | **C** |
| ***Release:*** | ⌘ | Rel-6 |

*Use one of the following categories:*
***F*** *(correction)*
***A*** *(corresponds to a correction in an earlier release)*
***B*** *(addition of feature),*
***C*** *(functional modification of feature)*
***D*** *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

*Use one of the following releases:*

| | |
|---|---|
| *2* | *(GSM Phase 2)* |
| *R96* | *(Release 1996)* |
| *R97* | *(Release 1997)* |
| *R98* | *(Release 1998)* |
| *R99* | *(Release 1999)* |
| *Rel-4* | *(Release 4)* |
| *Rel-5* | *(Release 5)* |
| *Rel-6* | *(Release 6)* |

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | Some concepts for PSI are clarified for better stage 3 understanding |
| ***Summary of change:*** | ⌘ | Clarify that only the user part of the PSI can be modified by the users and that Distinct PSIs that can be changed by the user via Ut can either be individual or part o a wildcard PSI |
| ***Consequences if not approved:*** | ⌘ | Unclear stage 3 input |

| | | | | | |
|---|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 5.4.12, 5.4.12.2 | | | |
| | | **Y** | **N** | | |
| ***Other specs affected:*** | ⌘ | | **N** | Other core specifications | ⌘ |
| | | | **N** | Test specifications | |
| | | | **N** | O&M Specifications | |
| ***Other comments:*** | ⌘ | | | | |

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

-- First modified section --

## 5.4.12 Configuration and Routing principles for Public Service Identities

Depending on the service nature, different mechanisms may be used for configuration and routing of PSIs according to operator preference.

When PSIs are created, the uniqueness of a PSI shall be ensured. Note that only the username part of a PSI is definable within a predefined hostname(s).

Whenever possible, routing to/from a Public Service Identity (PSI) should be provided using basic principles used for IMS routing.

### 5.4.12.1 PSIs on the originating side

The application server hosting the PSI may be invoked as an originating application server. This can be achieved by modifying the filter information within the subscription information of the users intending to use the service identified by the PSI. The PSI is then made available to these users.

The SIP requests are directed to the corresponding application server hosting the service according to the originating filtering rules in the S-CSCF of the user who is using the service.

Such statically pre-configured PSIs are only available internally within IMS of the operator's domain.

### 5.4.12.2 PSIs on the terminating side

The application server hosting the PSI may be invoked as a terminating application server with the AS and related PSIs configured in the home network, e.g. HSS. Such PSIs are globally routable and can be made available to users within and outside the operator domain, and can take the following form:

- Distinct PSIs (e.g. my_service@example.com).
- Wildcarded PSIs (chatlist_*@example.com): A range of PSIs with the same domain part in the SIP URI is defined using a wildcard indication in the userpart of the SIP-URI.

Distinct PSIs can be created or deleted ~~within the wildcarded range~~, by the users using the Ut interface, or by the operator via O&M mechanisms.

For both the distinct PSIs and wildcarded PSIs, there are two ways to route towards the AS hosting the PSI:

a) The HSS maintains the assigned S-CSCF information and ISC Filter Criteria to route to the AS hosting the PSI according to IMS routing principles. In this case, the I-CSCF receives SIP requests at the terminating side, queries the HSS and directs the request to the S-CSCF assigned to the PSI. The S-CSCF forwards the session to the application server hosting the PSI according to the terminating ISC Filter Criteria.

b) The home database maintains the address information of the AS hosting the PSI. In this case, the AS address information for the PSI is returned to the I-CSCF in the location query response, in which case the I-CSCF will forward the request directly to the AS hosting the PSI.

Figure 5.4.12.a depicts a routing example for incoming session where the HSS has the PSI defined in the database and then the session request is routed directly to the AS hosting the PSI.

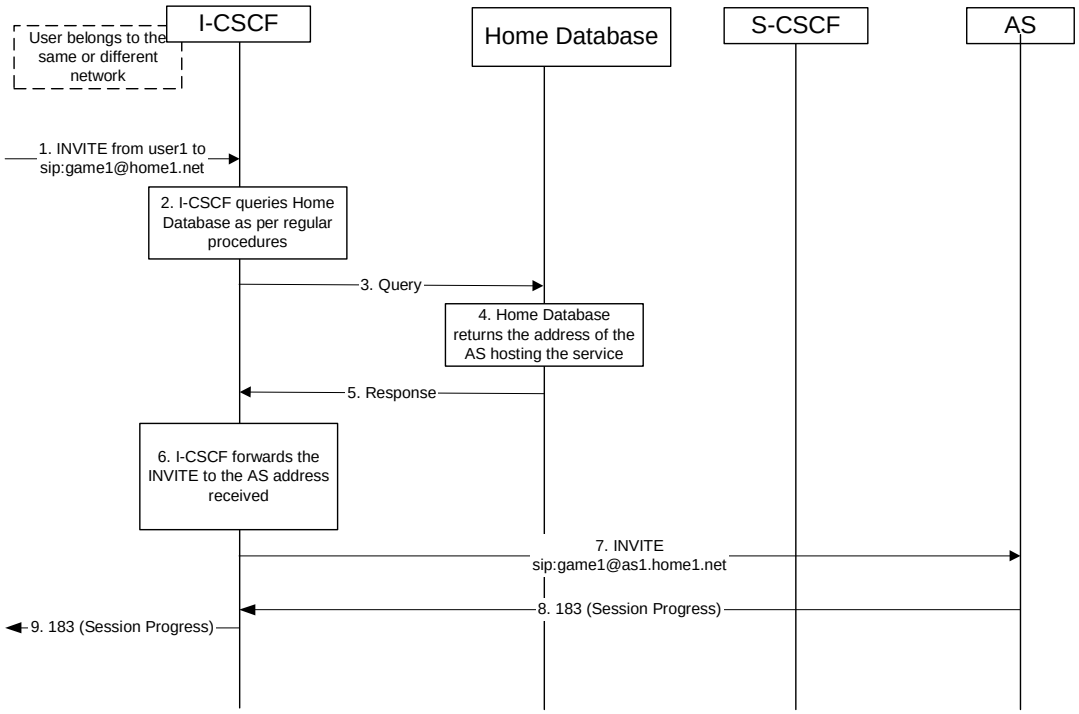


**Figure 5.4.12.a Incoming session, direct route towards the AS**

1. I-CSCF receives a request destined to the PSI.

2-3. I-CSCF queries Home Database in order to determine the next hop in the routing path for the PSI.

4. Home database determines the routing information, i.e., the address of the AS hosting the PSI.

5. Home database returns the AS address to the I-CSCF.

6-7. I-CSCF forwards the request to the address received from the query.

8-9. Session setup completes as per existing procedures.

Figure 5.4.12.b depicts an example routing scenario where the basic IMS routing via S-CSCF is used to route the session.

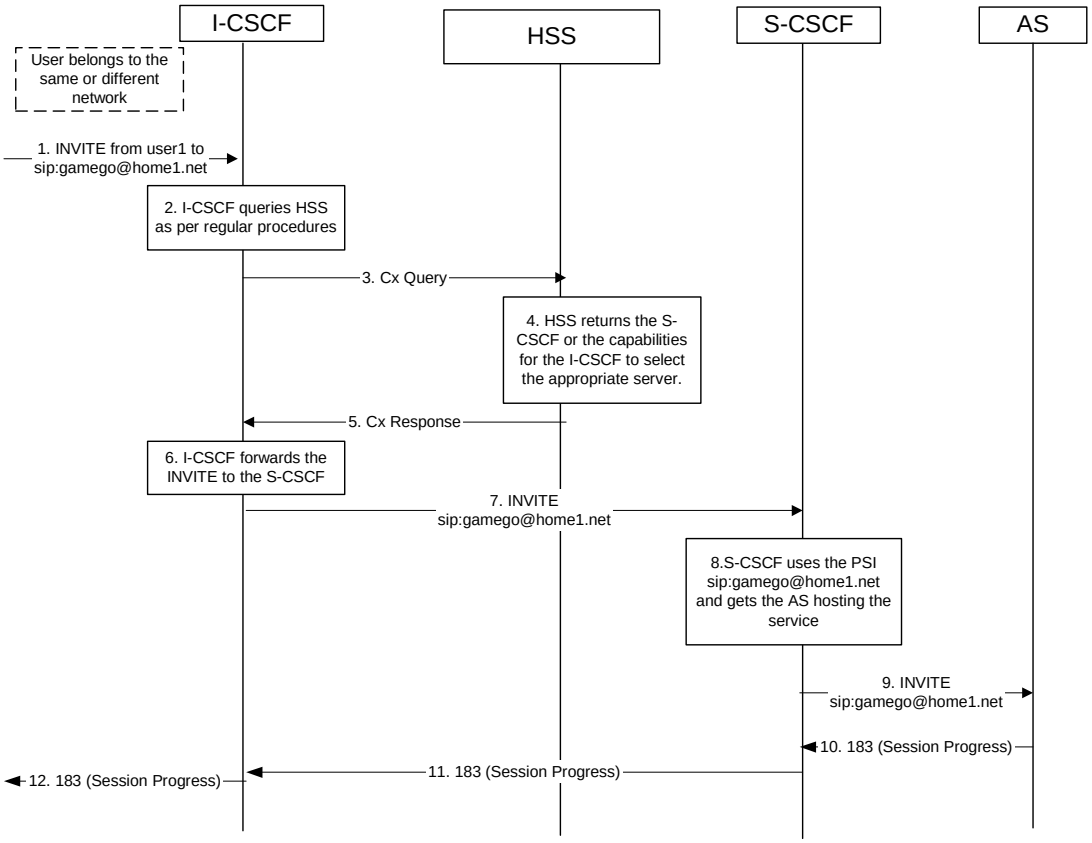


**Figure 5.4.12.b Incoming session, indirect route to AS via S-CSCF**

1. I-CSCF receives a request destined to the PSI.

2-3. I-CSCF queries HSS in order to determine the next hop in the routing path for the PSI.

4. HSS determines the routing information, which is the S-CSCF defined for the AS hosting the PSI.

5. HSS returns the S-CSCF address/capabilities to the I-CSCF.

6-7. I-CSCF, as per existing procedures, forwards the request towards the entity (i.e., S-CSCF) received from the query, or the I-CSCF selects a new S-CSCF if required.

8. S-CSCF evaluates the filter criteria and gets the AS address where to forward the request.

9. The request is then routed towards the AS identified by the filter criteria.

10-12. Session setup completes as per existing procedures.

# *******End of modification**********