Technical Specification Group Services and System Aspects **TSGS#19(03)0303**

Meeting #20, Hämeenlinna, Finland
09-12 June 2003

Source: **TSG SA WG2**
Title: **CRs on 23.228**
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 #20.
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
S2-032173	AS use of the MRFC	23.228	297r3	B	6.1.0	6	IMS2	S2-32
S2-032102	Barring and roaming restrictions	23.228	313r1	F	5.8.0	5	IMS-CCR	S2-32
S2-032103	Barring and roaming restrictions	23.228	314r1	A	6.1.0	6	IMS2	S2-32
S2-032205	Capability to route non-SIP URIs	23.228	295r1	F	6.1.0	6	IMS2	S2-31
S2-032107	Clarifications on multiple registrations	23.228	302r1	C	6.1.0	6	IMS2	S2-32
S2-031402	Corrections and Clean-Up after Re-organisation of TS 23.228	23.228	288	F	6.1.0	6	IMSCOOP	S2-31
S2-032193	Data Format at Sh Reference Point	23.228	305r2	B	6.1.0	6	IMS2	S2-32
S2-032192	Enhancements for Messaging	23.228	291r4	C	6.1.0	6	IMS2	S2-32
S2-031557	Format of Public Service Identities	23.228	287r2	C	6.1.0	6	IMS2	S2-31
S2-032098	Guidelines for the UE to apply IPv6 privacy mechanism in conjunction with IMS	23.228	300r1	F	5.8.0	5	IMS-CCR	S2-32
S2-032099	Guidelines for the UE to apply IPv6 privacy mechanism in conjunction with IMS	23.228	301r1	A	6.1.0	6	IMS-CCR	S2-32
S2-031610	GUP for IMS Subscription Management	23.228	272r5	B	6.1.0	6	GUP	S2-31
S2-032203	Handling of IMS signalling information in QoS and PCO IEs at GGSN	23.228	292r2	F	5.7.0	5	IMS-CCR	S2-31
S2-032202	Handling of IMS signalling information in QoS and PCO IEs at GGSN	23.228	293r2	A	6.1.0	6	IMS-CCR	S2-31
S2-032104	Implicit Registration with multiple Service Profiles	23.228	317r1	F	5.8.0	5	IMS-CCR	S2-32
S2-032204	Implicit Registration with multiple Service Profiles	23.228	318r2	A	6.1.0	6	IMS-CCR	S2-32
S2-032096	IMS corrections	23.228	298r1	F	5.8.0	5	IMS-CCR	S2-32
S2-032097	IMS corrections	23.228	299r1	A	6.1.0	6	IMS-CCR	S2-32
S2-032139	IMS Group Management	23.228	286r3	B	6.1.0	6	IMS2	S2-32
S2-031545	Refreshing sessions	23.228	284r2	B	6.1.0	6	IMS2	S2-31
S2-032108	Public Service Identities Definition	23.228	306r1	C	6.1.0	6	IMS2	S2-32
S2-032113	S-CSCF requirements at registration	23.228	319	F	5.8.0	5	IMS-CCR	S2-32
S2-032114	S-CSCF requirements at registration	23.228	311r1	A	6.1.0	6	IMS-CCR	S2-32
S2-031553	SLF on Sh interface	23.228	296r3	B	6.1.0	6	IMS2	S2-31

3GPP TSG-SA WG2 Meeting #31
Seoul, Korea, 7-11 April 2003

Tdoc ⌘S2-031402

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **288** ⌘ **rev** **-** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	Corrections and Clean-Up after Re-organisation of TS 23.228
Source:	⌘	Siemens
Work item code:	⌘	IMSCOOP
Date:	⌘	02/04/2003
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:	⌘	CR 280 significantly revised and restructured TS 23.228. This CR corrects a few errors, which were introduced in this process.
Summary of change:	⌘	Changes include: - reference to Annex in Scope clause is corrected; - terminology for dedicated IP-CAN bearer for IMS related signalling is clarified; - a non-editorial change from CR280 in 5.4.6.3 is removed; - clarify that PEF is used for SBLP interactions; - acronym PEF is used consistently for policy enforcemant function in IP-CAN; - use of term “binding” is corrected; - GPRS specific text (on use of APN) is moved to Annex E; - a few other terminology corrections; - several other editorial corrections.
Consequences if not approved:	⌘	Severall editorial errors and misleading text remain in TS23.228, which may mislead stage 3 work.

Clauses affected:	⌘	1, 4.1, 4.2.6, 5.1, 5.4, Annex E

		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.

1 Scope

This document defines the stage-2 service description for the IP Multimedia Core Network Subsystem (IMS), which includes the elements necessary to support IP Multimedia (IM) services. ITU-T Recommendation I.130 [4] describes a three-stage method for characterisation of telecommunication services, and ITU-T Recommendation Q.65 [3] defines stage 2 of the method.

This document does not cover the Access Network functionality except as they relate to provision of IM services, these aspects are covered in the normative Annex ~~X~~E. ~~The~~ 3GPP TS 23.060 [23] ~~contains~~ describes GPRS. ~~Access Network description and the~~ GSM 03.64 [5] contains an overall description of the GSM GPRS radio interface. 3GPP TS 25.301 [11] contains an overall description of the UMTS Terrestrial Radio Access Network.

This document identifies the mechanisms to enable support for IP multimedia applications. In order to align IP multimedia applications wherever possible with non-3GPP IP applications, the general approach is to adopt non-3GPP specific IP based solutions.

*** NEXT SET OF CHANGES ***

4.1 Relationship to CS domain and ~~-~~ the IP-Connectivity Access Network

The IP multimedia subsystem utilizes the IP-CAN to transport multimedia signalling and bearer traffic. The IP-CAN maintains the service while the terminal moves and hides these moves from the IP multimedia subsystem.

The IP multimedia subsystem is independent of the CS domain although some network elements may be common with the CS domain. This means that it is not necessary to deploy a CS domain in order to support an IP multimedia subsystem based network.

*** NEXT SET OF CHANGES ***

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.

*** NEXT SET OF CHANGES ***

5.1 CSCF related procedures

5.1.0 Establishing IP-Connectivity Access Network bearer for IM CN Subsystem Related Signalling

Before the UE can request IM services, an appropriate IP-CAN bearer must be available to carry IM Subsystem related signalling.

5.1.1 Procedures related to local CSCF discovery

The Proxy-CSCF discovery shall be performed using one of the following mechanisms:

- As part of the establishment of connectivity towards the IP-Connectivity Access Network, if the IP-Connectivity Access Network provides such means.

- Alternatively, the P-CSCF discovery may be perfomed after the IP connectivity has been established. To enable P-CSCF discovery after the establishment of IP connectivity, the IP-Connectivity Access Network shall provide the following P-CSCF discovery option to the UE:

  Use of DHCP to provide the UE with the domain name of a Proxy-CSCF and the address of a Domain Name Server (DNS) that is capable of resolving the Proxy-CSCF name, as described below in clause 5.1.1.1.

5.1.1.1 DHCP/DNS procedure for P-CSCF discovery

The DHCP relay agent within the IP-Connectivity Access Network relays DHCP messages between UE and the DHCP server.

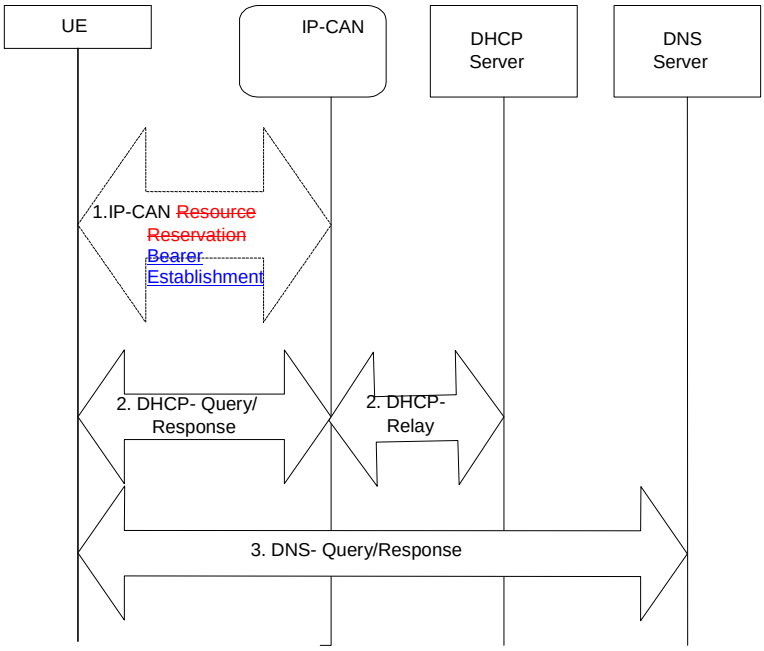

Figure 5.0a: P-CSCF discovery using DHCP and DNS

1. ~~Reserve~~ Establish an IP-Connectivity Access Network bearer if not already available by using the procedures available in the IP-Connectivity Access Network.

2. The UE requests a DHCP server and additionally requests the domain name of the P-CSCF and IP addresses of DNS servers. It may require a multiple DHCP Query/Response message exchange to retrieve the requested information.

3. The UE performs a DNS query to retrieve a list of P-CSCF(s) IP addresses from which one is selected. If the response does not contain the IP addresses, an additional DNS query is needed to resolve a Fully Qualified Domain Name (FQDN) to an IP address.

After reception of domain name and IP address of a P-CSCF the UE may initiate communication towards the IM subsystem.

*** NEXT SET OF CHANGES ***

5.3.2.1 Network Initiated Application (SIP) De-registration, Registration Timeout

The following flow shows a network initiated IM CN subsystem terminal application (SIP) de-registration based on a registration timeout. A timer value is provided at initial registration and is refreshed by subsequent re-registrations. The flow assumes that the timer has expired. The locations (home or visited network) of the P-CSCF and S-CSCF are not indicated as the scenario remains the same for all cases.

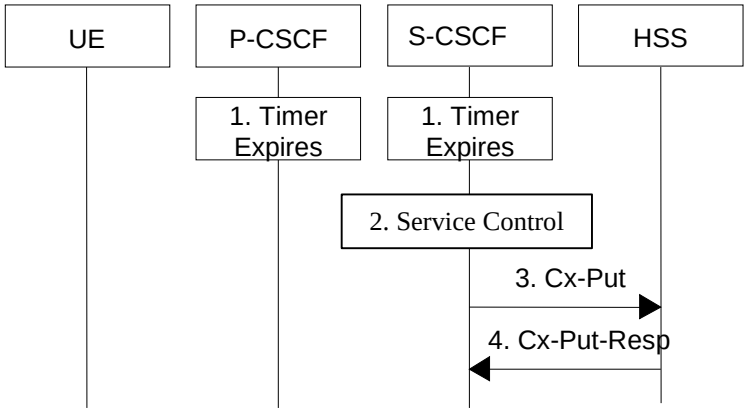

Figure 5.4: Network initiated application de-registration, registration timeout

1. The registration timers in the P-CSCF and in the S-CSCF expire. The timers are assumed to be close enough that no external synchronisation is required. The P-CSCF updates its internal databases to remove the public user identity ~~-~~from being registered. It is assumed that any cleanup of IP-Connectivity Access Network ~~bearer~~ resources will be handled by independent means.

2. Based on the filter criteria, the S-CSCF shall send de-registration information to the service control platform and perform whatever service control procedures are appropriate. Service control platform removes all subscription information related to this specific public user identity.

3. Based on operator choice the S-CSCF can send either Cx-Put (public user identity, private user identity, clear S-CSCF name) or Cx-Put (public user identity, private user identity, keep S-CSCF name), and the public user identity is no longer considered registered in the S-CSCF. The HSS then either clears or keeps S-CSCF name for that public user identity according to the request. In both cases the state of the public user identity is stored as unregistered in the HSS. If the S-CSCF name is kept, then the HSS shall be able to clear the serving S-CSCF at any time.

4. The HSS shall send Cx-Put Resp to the S-CSCF to acknowledge the sending of Cx-Put.

*** NEXT SET OF CHANGES ***

5.4.4 Requirements for IP multi-media session control

In order for operators to be able to offer a “carrier-grade” IP multimedia service, and to require bearers whose features (e.g. Bandwidth) are coherent with the media components negotiated through CSCFs, the following features shall be offered:

1. Both end points of the session shall be able to negotiate (according to service /UE settings,) which resources (i.e. which media components) need to be established before the destination party is alerted. The session signalling shall ensure that these resources (including IP-Connectivity Access Network resources and IP multimedia backbone resources) are made available or reserved before the destination UE rings.

This should nevertheless not prevent the UE from offering to the end-user the choice of accepting or rejecting the components of the session before establishing the bearers.

2. Depending on regulatory requirements, the IP multimedia service shall be able to charge the originating party for the IP-Connectivity Access Network service of both originating and destination side or when reverse charging applies to charge the terminating party for the IP-Connectivity Access Network service of both originating and terminating side. This implies that it should be easy to correlate CDR held by the IP-Connectivity Access Network service ~~(e.g. GPRS)~~ with a session.

3. The session control function of IP multimedia network of an operator (CSCF) shall be able (according to operator choice) to have a strict control (e.g. on source /destination IP address, QoS) on the flows associated with session established through SIP entering the IP multimedia bearer network from IP-Connectivity Access Network service. This does not mean that CSCF is the enforcement point (which actually is the Gateway between the IP-Connectivity Access Network and the IP multimedia network) but that the CSCF may be the final decision point for this control.

4. The session control and bearer control mechanisms shall allow the session control to decide when user plane traffic between end-points of a SIP session may start/shall stop. This allows this traffic to start/stop in synchronisation with the start/stop of charging for a session.

5. The IP-Connectivity Access Network service shall be able to notify the IP multimedia session control when the IP-Connectivity Access Network service has either modified or suspend\ed or released the bearer(s) of a user associated with a session (because e.g. the user is no longer reachable).

6. The solution shall comply with the architectural rules relating to separation of bearer level, session control level, and service level expressed in 23.221[7].

*** NEXT SET OF CHANGES ***

5.4.6.3 Mechanism for bearer establishment

In order to fulfil the above requirements, it is needed that the destination user can be pre-alerted before the bearer establishment and negotiation and IP-Connectivity Access Network bearer activation has taken place. This gives room for the destination user to choose the media streams and codecs required before an expensive resource (as the air interface is) is established.

Figure 5.7 shows the mechanism for the bearer establishment in which the pre-alerting occurs before the initial bearer creation procedures are performed. Furthermore, a user interaction may also occur after the initial bearers are created as shown in figure 5.7. If the session originator receives multiple provisional responses for the same session indicating that the session has been forked in the network, the UE may choose to process a pre-configured number of responses. In the case of multiple responses, the resources requested by the UE shall be the “logical OR” (i.e. least upper bound) of the resources indicated in the multiple responses to avoid allocation of unnecessary resources. The UE shall never request more resources then was originally proposed in the Original INVITE.

The "Other x-CSCFs" entity in figure 5.7 comprises several CSCFs: I-CSCF and S-CSCFs. For the sake of simplicity only the IP-Connectivity Access Network is shown,and the Policy Decision Functions have been omitted from the diagram.

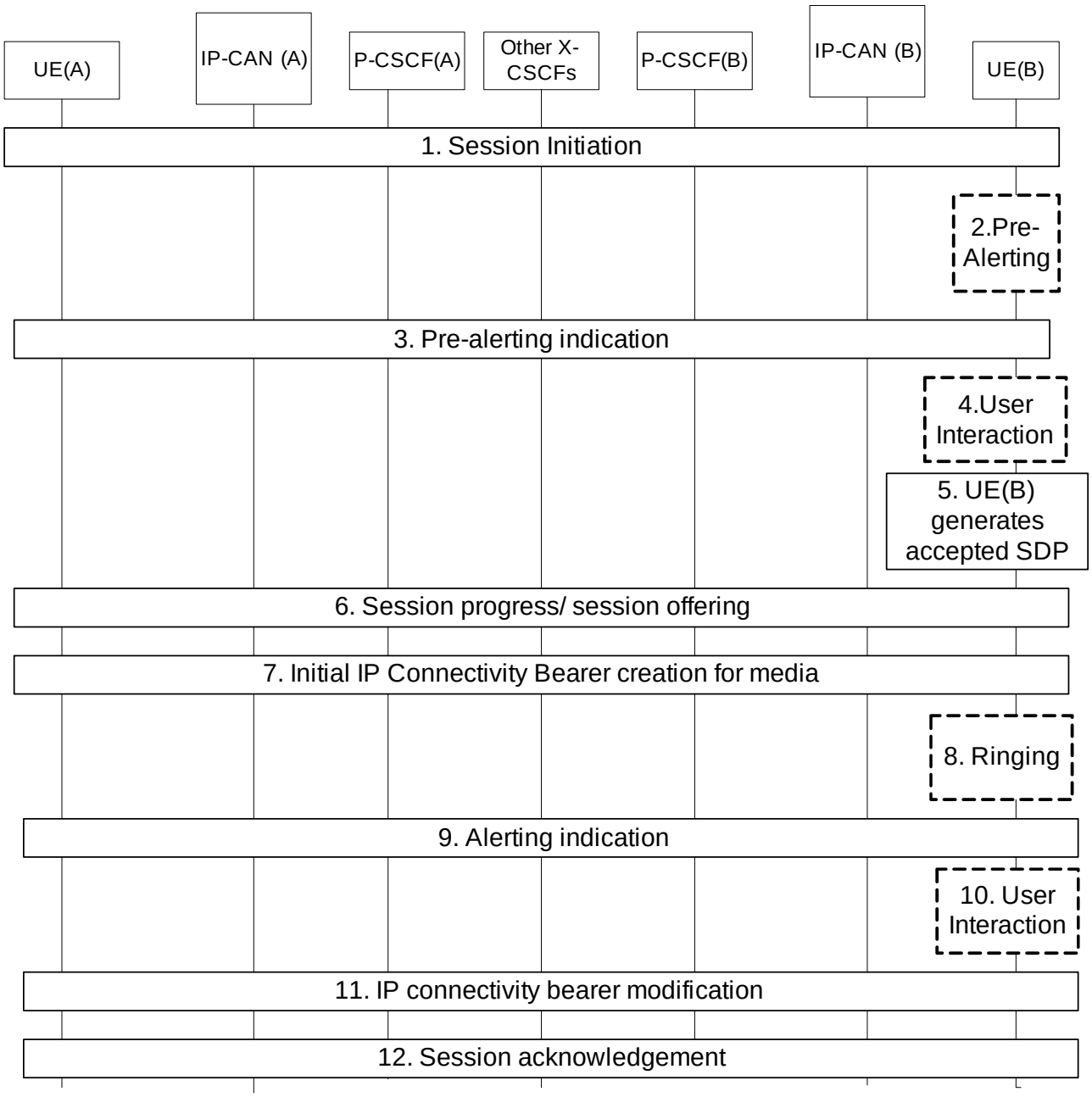

Figure 5.7: Bearer establishment showing optional pre-alerting

1. UE(A) starts a Session Initiation procedure to UE(B) that includes an SDP proposal.

The steps 2-4 are optional and may depend on terminal implementation and/or terminal pre-configured settings.

2. The user at UE(B) is pre-alerted.
3. An indication of the pre-alerting may be sent towards UE(A).
4. User at UE(B) will then interact and express his/her wishes regarding the actual session.
5. UE(B) generates accepted SDP based on terminal settings, terminal pre-configured profiles and optionally the user's wishes.
6. The accepted SDP is forwarded to UE(A) in the payload of a reliable SIP response.
7. ~~If the media requires separate IP-CAN bearer, i~~Initial bearer creation procedure is performed. During this bearer creation step the resources in the UE(A)'s and UE(B)'s IP-CANs are reserved. Bearer resources in external networks may also be reserved at this point.

The steps 8-10 are also optional and may be skipped.

8. Terminal at UE(B) starts ringing.
9. The alerting indication is sent towards UE(A).
10. User at UE(B) may interact and express his/her wishes regarding the actual session.
11. UE(A) and UE(B) may perform bearer modification procedure at this point, if the initial bearers reserved in step 7 and the wishes of user at UE(B) are different. During this bearer modification step the resources in the IP-CANs of UE(A)~~'s~~ and UE(B)~~'s access network~~ may be modified, and the resource reservation in the external network may also be modified.
12. Session initiation procedure is acknowledged.

5.4.6.4 Session progress indication to the originating UE

The pre-alerting or alerting indications returned to the originating UE shall enable the

originating UE to inform the calling user of the session progress prior to the arrival of the incoming media (for example the originating UE may synthesise ringing locally).

5.4.7 Interaction between QoS and session signalling

At IP-CAN bearer ~~reservation~~ activation the user shall have access to either IP-CAN services without service-based local policy, or IP-CAN services with service-based local policy. It is operator choice whether to offer both or only one of these alternatives for accessing the IM Subsystem.

When using IP-CAN without service-based local policy, the bearer is established according to the user's subscription, local operator's IP bearer resource based policy, local operator's admission control function and roaming agreements.

When using IP-CAN with service-based local policy, Service-Based Local Policy decisions (e.g., authorisation and control) are also applied to the bearer.

The description in this clause and the following sub-clauses (sub-clauses 5.4.7.1 – 5.4.7.7) is applicable for the case when service-based local policy is employed.

The IP-Connectivity Access Network contains a Policy Enforcement Function (PEF) that has the capability of policing packet flow into the IP network, and restricting the set of IP destinations that may be reached from/through an IP-CAN bearer according to a packet classifier. This service-based policy 'gate' function has an external control interface that allows it to be selectively 'opened' or 'closed' on the basis of IP destination address and port. When open, the gate allows packets to pass through (to the destination specified in the classifier) and when closed, no packets are allowed to pass through. The control is performed by a PDF, which is a logical entity of the P-CSCF. (Note: If the PDF is implemented in a separate physical node, the interface between the PDF and the P-CSCF is not standardised).

There are eight interactions defined for service-based local policy:

1. Authorize QoS Resources.
2. Resource Reservation with Service-based Local Policy.
3. Approval of QoS Commit for resources authorised in (1), e.g. 'open' the 'gate'.
4. Removal of QoS Commit for resources authorised in (1), e.g. 'close' the 'gate'.
5. Revoke Authorisation for IP-CAN and IP resources.
6. Indication of IP-CAN bearer release from the PEF in the IP-Connectivity Access Network to the PDF.
7. Authorization of IP-CAN bearer modification
8. Indication of IP-CAN bearer modification from the PEF in the IP-Connectivity Access Network to the PDF.

These requirements and functional description of these interactions are explained further in the following sections. The complete specification of the interface between the Policy Decision Function and the Policy Enforcement Function is contained in TS 23.207.

5.4.7.1 Authorize QoS Resources

The Authorize QoS Resources procedure is used during an establishment of a SIP session. The P-CSCF(PDF) shall use the SDP contained in the SIP signaling to calculate the proper authorisation. The PDF authorizes the required QoS resources.

The authorisation shall include binding information, which shall also be provided by the UE in the allocation request to the IP-CAN, which enables accurate matching of requests and authorisations. The binding information includes an Authorisation Token sent by the P-CSCF to the UE during SIP signaling, and one or more Flow Identifiers, which are used, by the UE, the ~~Policy Enforcement Function~~PEF within the IP-Connectivity Access Networkand PDF to uniquely identify the media component(s). If forking has occurred, the P-CSCF will re-use the same Authorisation Token in all subsequent provisional responses belonging to the same session. If the least upper bound of the requested resources is changed due to a subsequently received response then an update of the authorised resources is performed.

The authorisation shall be expressed in terms of the IP resources to be authorised and shall include limits on IP packet flows, and may include restrictions on IP destination address and port.

5.4.7.1a Resource Reservation with Service-based Local Policy

The IP-CAN provides the Policy Enforcement Point that implements the policy decisions for performing admission control and authorising the IP-CAN and IP BS QoS Resource request, and policing IP flows entering the external IP network.

Authorisation of IP-CAN and IP QoS Resources shall be required for access to the IP Multimedia Subsystem. The IP-CAN shall determine the need for authorisation, possibly based on provisioning and/or based on ~~the~~ requested parameters, which ~~are~~may be IP-CAN specific ~~(e.g. APN for GPRS)~~.

Resource Reservation shall be initiated by the UE, and shall take place only after successful authorisation of QoS resources by the PDF. Resource reservation requests from the UE shall contain the binding information ~~received from the P-CSCF during IMS signaling~~ which enables the IP-CAN to correctly match the reservation request to the corresponding authorisation. The authorisation shall be 'Pulled' from the PDF by the ~~Policy Enforcement Function~~PEF within the IP-CAN when the reservation request is received from the UE. When a UE combines multiple media flows onto a single IP-CAN bearer, all of the binding information related to those media flows shall be provided in the resource reservation request.

With a request for IP-CAN QoS resources, the ~~Policy Enforcement Function~~PEF within the IP-CAN shall verify the request is less than the sum of the authorised IP resources (within the error tolerance of the conversion mechanism) for all of the combined media flows. With a request for IP QoS resources, the ~~Policy Enforcement Function~~PEF within the IP-CAN shall verify the request is less than the authorised IP resources.

5.4.7.2 Approval of QoS Commit

The PDF makes policy decisions and provides an indication to the ~~Policy Enforcement Function~~PEF within the IP-CAN that the user is now allowed to use the allocated QoS resources for per-session authorisations unless this was done based on service based local policy at the time of the Resource Reservation procedure. If there is more than one response for the same session, indicating that the session has been forked in the network, the PDF may authorise the "logical OR" of the resources requested in the responses. When the session established indication has been received, if the PDF earlier have authorised the "logical OR" of the resources then the PDF will modify the authorisation and commit to resources according to the session established indication.

The ~~Policy Enforcement Function~~PEF within the IP-CAN enforces the policy decisions. The IP-CAN may restrict any use of the IP-CAN resources prior to this indication from the PDF. The IP-CAN shall restrict any use of the IP resources prior to this indication from the PDF, e.g. by open the gate and enabling the use of resources for the media flow. Based on local policy, IP-CAN and/or IP resources may beallowed to be used by the user at the time they are authorised by the PDF.

5.4.7.3 Removal of QoS Commit

The PDF makes policy decisions and provides an indication to the ~~Policy Enforcement Function~~PEF within the IP-CAN about revoking the user's capacity to use the allocated QoS resources for per-session authorisations. Removal of QoS Commit for IP-CAN and IP resources shall be sent as a separate decision to the ~~Policy Enforcement Function~~PEF within the IP-CANcorresponding to the previous "Approval of QoS commit" request.

The ~~Policy Enforcement Function~~PEF within the IP-CAN enforces the policy decisions. The IP-CAN may restrict any use of the IP-CAN resources after this indication from the PDF. The IP-CAN shall restrict any use of the IP resources after this indication from the PDF, e.g. by closing the gate and blocking the media flow.

5.4.7.4 Revoke Authorisation for IP-Connectivity Access Networkand IP Resources

At IP multimedia session release, the UE should deactivate the IP-CAN bearer(s) used for the IP multimedia session. In various cases the UE will be unable to perform this release itself. The Policy Decision Function provides indication to the ~~Policy Enforcement Function~~PEF within the IP-CAN when the resources previous authorised, and possibly allocated by the UE, are to be released. The IP-CAN shall deactivate the IP-CAN bearer used for the IP multimedia session.

5.4.7.5 Indication of IP-Connectivity Access Network bearer release

Any release of IP-CAN bearer(s) that were established based on authorisation from the PDF shall be reported to the PDF by the PEF within the IP-CAN.

This indication may be used by the PDF to initiate a session release towards the remote endpoint.

5.4.7.6 Authorization of IP-Connectivity Access Network bearer modification

When an IP-CAN bearer is modified such that the requested QoS falls outside of the limits that were authorized at IP-CAN bearer activation (or last modification) or such that new binding information is received, then the PEF within the IP-CAN shall verify the authorization of this IP-CAN bearer modification.

If the ~~Policy Enforcement Function~~PEF within the IP-CAN does not have sufficient information to authorize the IP-CAN bearer modification request, the ~~Policy Enforcement Function~~PEF within the IP-CAN shall send an authorization request to the PDF.

5.4.7.7 Indication of IP-Connectivity Access Network bearer modification

When an IP-CAN bearer is modified such that the maximum bit rate (downlink and uplink) is downgraded to 0 kbit/s or changed from 0 kbit/s to a value that falls within the limits that were authorized at IP-CAN bearer activation (or last modification) then the ~~Policy Enforcement Function~~PEF within the IP-CAN shall report this to the PDF.

This indication may be used by the PDF to initiate a session release towards the remote endpoint.

*** NEXT SET OF CHANGES ***

5.4.9 Event and information distribution

The S-CSCF and Application Servers (SIP-AS, IM-SSF, OSA-SCS) shall be able to send service information messages to endpoints. This shall be done based on a SIP Request/Response information exchange containing the service information and/or a list of URI(s) pointing to the location of information represented in other media formats. The stimulus for initiating the service event related information message may come from e.g. a service logic residing in an application server.

In addition, the end points shall also be able to send information to each other. This information shall be delivered using SIP based messages. The corresponding SIP messages shall be forwarded along the IMS SIP signalling path. This includes the S-CSCF but may also include SIP application servers. The information may be related or unrelated to any ongoing session and/or may be independent of any session. Applicable mechanisms (for e.g. routing, security, charging, etc) defined for IMS SIP sessions shall also be applied for the SIP based messages delivering the end-point information. The length of the information transferred is restricted by the message size (e.g. the MTU), so fragmentation and re-assembly of the information is not required to be supported in the UE. This information may include e.g. text message, http url, etc.

This mechanism considers the following issues:

- The IMS has the capability to handle different kinds of media. That is, it is possible to provide information contained within several different media formats e.g. text, pictures or video.
- The UE's level of supporting service event related information and its exchange may depend on the UE's capabilities and configuration.

- A UE not participating in the service related information exchange shall not be effected by a service related information exchange possibly being performed with another UE of the session.

Note: The service event related information exchange may either take place in the context of a session, or independently outside the context of any existing session.

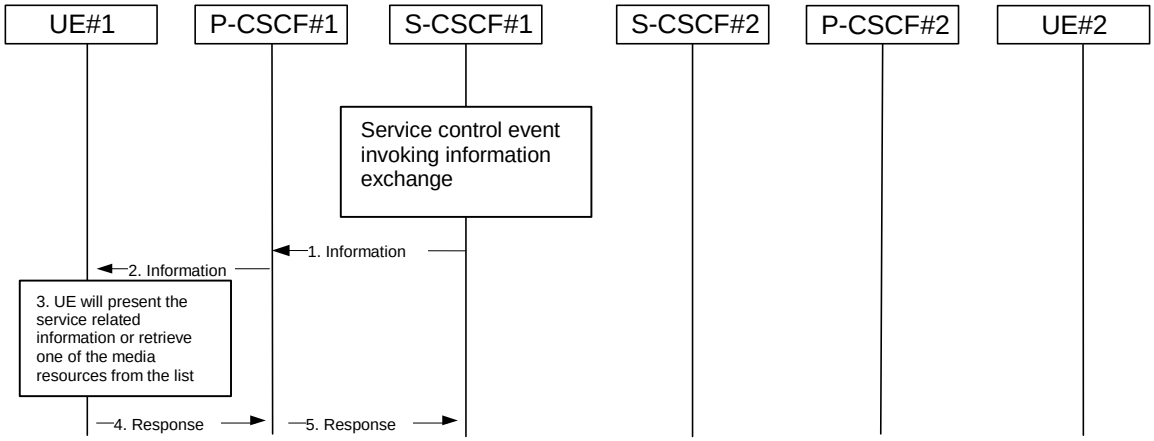

Figure 5.8: Providing service event related information to related endpoint

1. When a service event occurs that the S-CSCF or the Application Server wishes to inform an endpoint about, the S-CSCF or the Application Server generates a message request containing information to be presented to the user. The contents may include text describing the service event, a list of URI(s) or other service modification information.
2. P-CSCF forwards the message request.
3. UE presents the service-related information, to the extent that it conforms to its capabilities and configuration, to the user.
4. Possibly after interaction with the user, the UE will be able to include information in the response to the S-CSCF.
5. P-CSCF forwards the response.

Note 1: The UE may retrieve service event related information using IP-CAN or IMS procedures.

Note 2: transport aspects of the information transfer described above may require further considerations.

*** NEXT SET OF CHANGES ***

Annex E (Normative): IP-Connectivity Access Network specific concepts when using GPRS to access IMS

This cl~~u~~ause describes the main IP-Connectivity Access Network specific concepts that are used for the provisioning of IMS services over GPRS access with a GERAN and/or UTRAN radio access.

When using GPRS-access, the IP-Connectivity Access Network bearers are provided by PDP Context(s).

*** NEXT SET OF CHANGES ***

E.2.3 Interaction between GPRS QoS and session signaling

The generic mechanisms for interaction between QoS and session signaling are described in clause 5.4.7, the mechanisms described there are applicable to GPRS-access as well.
This clause describes the GPRS-access-specific concepts.

At PDP context setup the user shall have access to either GPRS without service-based local policy, or GPRS with service-based local policy. The GGSN shall determine the need for service-based local policy, possibly based on provisioning and/or based on the APN of the PDP context.

For the GPRS without service-based local policy case, the bearer is established according to the user's subscription, local operator's IP bearer resource based policy, local operator's admission control function and GPRS roaming agreements. The establishment of the PDP context bearer shall use the PDP context activation procedure specified in TS 23.060.

For the GPRS with service-based local policy case, Service-Based Local Policy decisions (e.g., authorisation and control) are also applied to the bearer.

The GGSN contains a Policy Enforcement Function (PEF).

3GPP TSG-SA WG2 Meeting #31
Seoul, Korea, 7th-11th April 2003

Tdoc S2-032205
revised 1451

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** 295 ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	Capability to route non-SIP URIs
Source:	⌘	Nokia
Work item code:	⌘	IMS2
Date:	⌘	02/04/2003
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:	⌘	The S2-030919rev1 (CR275) was accepted during last email approval and in the SA plenary. During the e-mail discussions it was identified that the added text is not very clear. This CR attempts to make text more readable.
Summary of change:	⌘	Text in subclause 4.3.3.3 is clarified
Consequences if not approved:	⌘	Unclear text remains.

Clauses affected:	⌘	4.3.3.3

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

Other comments:	⌘	Updated by MCC to fill the empty CR number cell post the meeting

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:

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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.

4.3.3.3 Routing of SIP signalling within the IP multimedia subsystem

Routing of SIP signalling within the IMS shall use SIP URIs or other (non SIP) AbsoluteURIs. AbsoluteURIs are defined in RFC 2396 [13]. Routing of SIP signalling within the IMS using AbsoluteURI (non SIP ~~URI~~) shall only be supported for IMS signalling from IMS user to external networks. E.164 [2] format public user identities shall not be used for routing within the IMS, and session requests based upon E.164 format public user identities will require conversion into SIP URL format for internal IMS usage.

3GPP TSG–SA2 Meeting #32
San Diego, USA, 12th to 16th May 2003

***Tdoc* ⌘S2-032204**
revised S2-032105

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **318** ⌘ **rev** **2** ⌘ Current version: **6.1.0** ⌘

*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 [X]

Title:	⌘	Implicit registration with multiple Service profiles
Source:	⌘	Orange
Work item code:	⌘	IMS-CCR
Date:	⌘	10/04/2003
Category:	⌘	**A**
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, it is not clear that multiple Service profiles may be stored during registration in case of implicit registration.
Summary of change:	⌘	This document proposes that the S-CSCF shall store during registration all the Service profiles associated with the public user identities~~y~~ being registered and allow the session establishment for these identities after the successful registration.
Consequences if not approved:	⌘	At session establishment for an implicitly registered identity, the S-CSCF will not be able to validate the Service profile. The S-CSCF will have to request the downloading of the Service profile from the HSS, which will increase the signalling messages on the Cx interface (and be repeated at each session establishment for each implicitly registered identity).

Clauses affected:	⌘	5.2.1a, 5.2.2.3, 5.2.2.4, 5.2.2.5

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

Other comments:	⌘	Updated by MCC to correct work item code post the meeting

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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 co

*** FIRST MODIFICATION ***

5.2.1a Implicit Registration

When an user has a set of public user identities defined to be implicitly registered via single IMS registration of one of the public user identity's in that set, it is considered to be an Implicit Registration. No single public identity shall be considered as a master to the other public user identities. Figure 5.2.1a shows a simple diagram of implicit registration and public user identities. In order to support this function, it is required that:

- HSS has the set of public user identities that are part of implicit registration.
- Cx reference point between S-CSCF and HSS shall support download of all public user identities associated with the implicit registration, during registration of any of the single public user identities within the set.
- All public user identities of an Implicit Registration set must be associated to the same private user identities. See figure 5.2.1.b for the detailed relationship between the public and private user entities within an Implicit Registration set.
- When one of the public user identities within the set is registered, all Public user identities associated with the implicit registration set are registered at the same time.
- When one of the public user identities within the set is de-registered, all public user identities that have been implicitly registered are de-registered at the same time.
- Registration and de-registration always relates to a particular contact address. A Public user identitity that has been registered (including when implicitly registered) with different contact addresses remains registered in relation to those contact addreses that have not been de-registered.
- Public user identities belonging to an implicit registration set may point to different service profiles; or some of these public user identities may point to the same service profile.
- When a public user identity belongs to an implicit registration set, it cannot be registered or de-registered individually without the public user identity being removed from the implicit registration list.
- All IMS related registration timers should apply to the set of implicitly registered public user identities
- S-CSCF, P-CSCF and UE shall be notified of the set of public user identities belonging to the implicitly registered function. Session set up shall not be allowed for the implicitly registered public user identities until the entities are updated, except for the explicitly registered public user identity.
- The S-CSCF shall store during registration all the Service profiles corresponding to the public user identities being registered.
- When a public user identity is barred from IMS communications, only the HSS and S-CSCF shall have access to this public user identity.

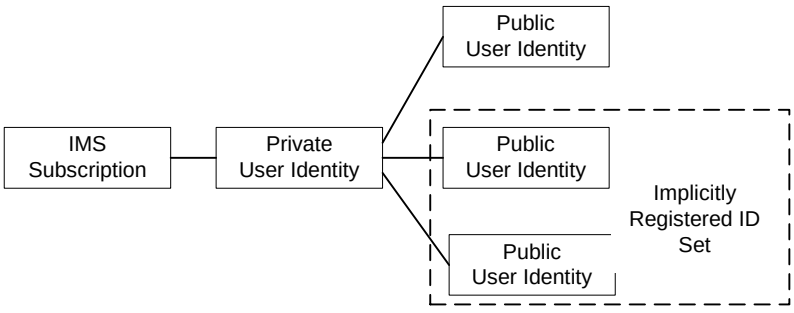

Figure 5.2.1a Relationship of public user identities when implicitly registered

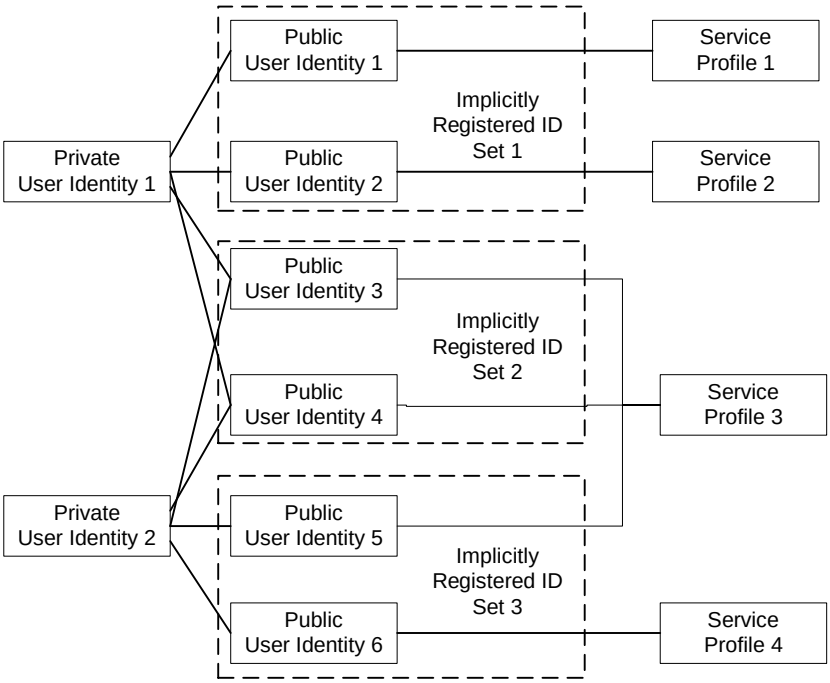

Figure 5.2.1.b – The relation of two shared Public User Identities (Public-ID-3 and 4) and Private User Identities

5.2.1a.1 Implicit Registration for UE without ISIM

In case an UE is registering in the IMS without ISIM, it shall require the network's assistance to register atleast one public user identity, which is used for session establishment & IMS signalling. Implicit registration shall be used as part of a mandatory function for these ISIM-less UEs to register the public user identity(s). In addition to the functions defined in section 5.2.1a, the following additional functions are required for this scenario.

- The Temporary public identity shall be used for initial registration process
- It shall be defined in HSS that if the user does not have implicit registration activated then the user shall not be allowed to register in the IMS using the Temporary public user identity.

*** END OF MODIFICATION ***

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **292** ⌘ **rev** **2** ⌘ Current version: **5.7.0** ⌘

*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:	⌘	Handling of IMS signalling information in QoS and PCO IEs at GGSN
Source:	⌘	Ericsson, Nortel, Nokia, Alcatel
Work item code:	⌘	IMS_CCR
Date:	⌘	09/04/03
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:	⌘	Care is needed to ensure that mobiles do not obtain enhanced QoS intended for signalling "incorrectly" . Hence, it is necessary that the GGSN shall be able to check that the signalling flag is negotiated accoring to operator policy.
Summary of change:	⌘	Include that enhanced QoS can be provided with the 'signalling indication'. Include the capability for the GGSN to downgrade this indication if so required by operator policy.
Consequences if not approved:	⌘	It may not be possible to control the use of the new "signalling flag" according to operator policies e.g. to restrict its use to IMS signalling.

Clauses affected:	⌘	4.2.6 and 3 new subclauses added under 4.2.6			
		Y	**N**		
Other specs affected:	⌘	**X**		Other core specifications	⌘ This CR is a result of a CR to 23.107 and this CR is linked to a CR on 23.060 & 23.207. CN specifications are also affected (e.g. 24.229, 29.060, 29.061).
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	Updated by MCC to have revision marks against original specification post the meeting			

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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.

******* FIRST CHANGE ********

4.2.6 Application Level Signalling

4.2.6.1 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.

~~4.2.6 QoS Requirements for IM CN subsystem signalling~~ 4.2.6.2 Requirements for IM CN subsystem signalling flag

~~The UE 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. The application level signalling flag is used to indicate the dedicated signalling PDP context. If the network operator does not support a dedicated signalling PDP context, the network will consider the PDP context as a general-purpose PDP context.~~
~~The use of a dedicated signalling PDP Context for IM Subsystem related signalling may provide enhanced QoS for signalling traffic.~~
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.
~~.~~If the ~~the~~ dedicated signalling PDP context 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 GGSN.
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 Release 5 for providing the information about the restrictions back to the UE, the available set of rules and restrictions in Release 5 is the set of capabilities as defined below.
The dedicated signalling PDP context is subject to restrictions,the capabilities to be applied is defined as follows: all messages from the UE on the Signalling PDP Context 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 GGSN and P-CSCF are located.
The UE is not trusted to implement these restrictions, therefore the restrictions are enforced in the GGSN by the operator of the GGSN.

4.2.6.3 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 4.2.6.1), with rules and restrictions applied in the network (as described in sub clause 4.2.6.2).

- 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 4.2.6.2, after it has been negotiated with the networks.

- Utilize a general purpose PDP Context with a negotiated QoS profile.

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 4.2.6.2.

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.

******* End of changes ********

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **293** ⌘ **rev** **2** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	Handling of IMS signalling information in QoS and PCO IEs at GGSN
Source:	⌘	Ericsson, Nokia, Nortel, Alcatel
Work item code:	⌘	IMS-CCR
Date:	⌘	09/04/03
Category:	⌘	**A**
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 Release 5 Changes into Rel 6 and make it generic. Care is needed to ensure that mobiles do not obtain enhanced QoS intended for signalling "incorrectly" . Hence, it is necessary that the GGSN shall be able to check that the signalling flag is negotiated accoring to operator policy.
Summary of change:	⌘	Include that enhanced QoS can be provided with the 'signalling indication'. Include the capability for the GGSN to downgrade this indication if so required by operator policy.
Consequences if not approved:	⌘	It may not be possible to control the use of the new "signalling flag" according to operator policies e.g. to restrict its use to IMS signalling.

Clauses affected:	⌘	No changes to 4.2.6 it is included to show that general requirements already cover QoS aspects, all changes are in GPRS specific IMS interactions starting in E.2.1 changed, E.2.1.1-3 introduced, E.2.1.1-2 changed to E.2.2.1.-2.

		Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘	This CR is a result of a CR to 23.107 and this CR is linked to a CR on 23.060 & 23.207. CN specifications are also affected (e.g. 24.229, 29.060, 29.061).
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘	Updated by MCC to correct work item code post the meeting

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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.

******* NO CHANGE in 4.2.6, SHOWN for CLARITY ONLY ********

4.2.6 QoS Requirements for IM CN subsystem signalling

The UE shall be able to establish dedicated 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 IP-CAN bearer for IM Subsystem related signalling may provide enhanced QoS for signalling traffic.
If a dedicated 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 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 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.

********** FIRST Change **********

E.2 QoS related concepts

E.2.1 ~~QoS Requirements for IM CN subsystem signalling~~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.
~~The application level signalling flag is used to indicate the dedicated signalling PDP context. If the network operator does not support a dedicated signalling PDP context, the network will consider the PDP context as a general-purpose PDP context.~~

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.

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.

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.2.2 PDP context procedures for IMS

E.2.~~1~~2.1 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 QoS profile parameters for this PDP context are appropriate for IM Subsystem related signalling. The QoS profile parameters are detailed in TS23.107.~~ The IM CN subsystem signalling flag and the Signalling Indication in the QoS ~~profile parameters~~ IE may be used independently of each other.

E.2.2~~1~~.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].

******* End of changes ********

3GPP TSG-SA WG2 Meeting #32
San Diego,CA, USA, 12-16 May 2003

Tdoc ⌘S2-032193

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **305** ⌘ **rev** **2** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	Data Format at Sh Reference Point
Source:	⌘	Siemens
Work item code:	⌘	IMS2
Date:	⌘	14/05/2003
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:	⌘	The Sh reference point allows Application Servers to tranfer data to and from the HSS. While, in theory, other Application Servers may access the data, significant limitations exist in practice, as no standardised data format has been agreed and defined so far. There is a high risk of non-interoperable implementations in that respect. At the same time the Mt reference point already introduces a standardised data format.
Summary of change:	⌘	It is proposed to support a standardised data format, which enables inter-operability between application servers. This standardised data format shall be aligned with the data format used at the Mt reference point.
Consequences if not approved:	⌘	High risk of non-interoperable implementations.

Clauses affected:	⌘	4.2.4a

		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.

4.2.4a HSS to service platform Interface

The “application server” (SIP Application Server and/or the OSA service capability server and/or IM-SSF) may communicate to the HSS. The Sh and Si interfaces are used for this purpose.

For the Sh interface, the following shall apply:

1. The Sh interface is an intra-operator interface.

2. The Sh interface is between the HSS and the “SIP application server” and between the HSS and the “OSA service capability server”. The HSS is responsible for policing what information will be provided to each individual application server.

3. The Sh interface transports transparent data for e.g. service related data , user related information, …
In this case, the term transparent implies that the exact representation of the information is not understood by the HSS or the protocol.

4. The Sh interface also supports mechanisms for transfer of user related data stored in the HSS (e.g. user service related data, MSISDN, visited network capabilities, user location (cell global ID/SAI or the address of the serving network element, etc))

Note: before providing information relating to the location of the user to a SIP Application Server, detailed privacy checks frequently need to be performed in order to meet the requirements in TS22.071 [27]. The SIP Application Server can ensure that these privacy requirements are met by using the Le interface to the GMLC (see TS 23.271) instead of using the Sh interface.

5. The Sh interface also supports mechanisms for transfer of standardised data, e.g. for group lists, which can be accessed by different application servers. Those application servers sharing the data shall understand the data format. This enables sharing of common information between application servers, e.g. data managed via the Ut reference point.

The Si interface is between the HSS and the IM-SSF. It transports CAMEL subscription information including triggers for use by CAMEL based application services.

3GPP TSG-SA2 Meeting #32
San Diego, USA, 10.-17.05.2003

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CHANGE REQUEST

⌘ **23.228** **CR** **291** ⌘ **rev** **4** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	Enhancements for Messaging
Source:	⌘	Ericsson
Work item code:	⌘	IMS-2
Date:	⌘	22/05/2003
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:	⌘	Currently chapter 5.16 in 23.228 contains only simple call flows for immediate messaging. Discussion on issues like addressing, privacy, content handling and limitations, filtering, media types and message lengths, etc. are left for further study. Details for Immediate Messaging when the destinating UE is unregistered are also needed.
Summary of change:	⌘	More detailed description of the service logic in case of immediate messaging, including when the destination is unregistered. This includes the possibility to specify how long time the message should be considered valid and a possibility for the terminating AS to hold the message in case the UE is not registered.
Consequences if not approved:	⌘	No detailed description/requirements available for stage 3 standardization in case of immediate messaging.

Clauses affected:	⌘	5.16.1.1

Other specs affected: ⌘	Y	N		⌘
		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.

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 ~~on message length, FFS~~ based on operator policy and user preferences/intent).

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

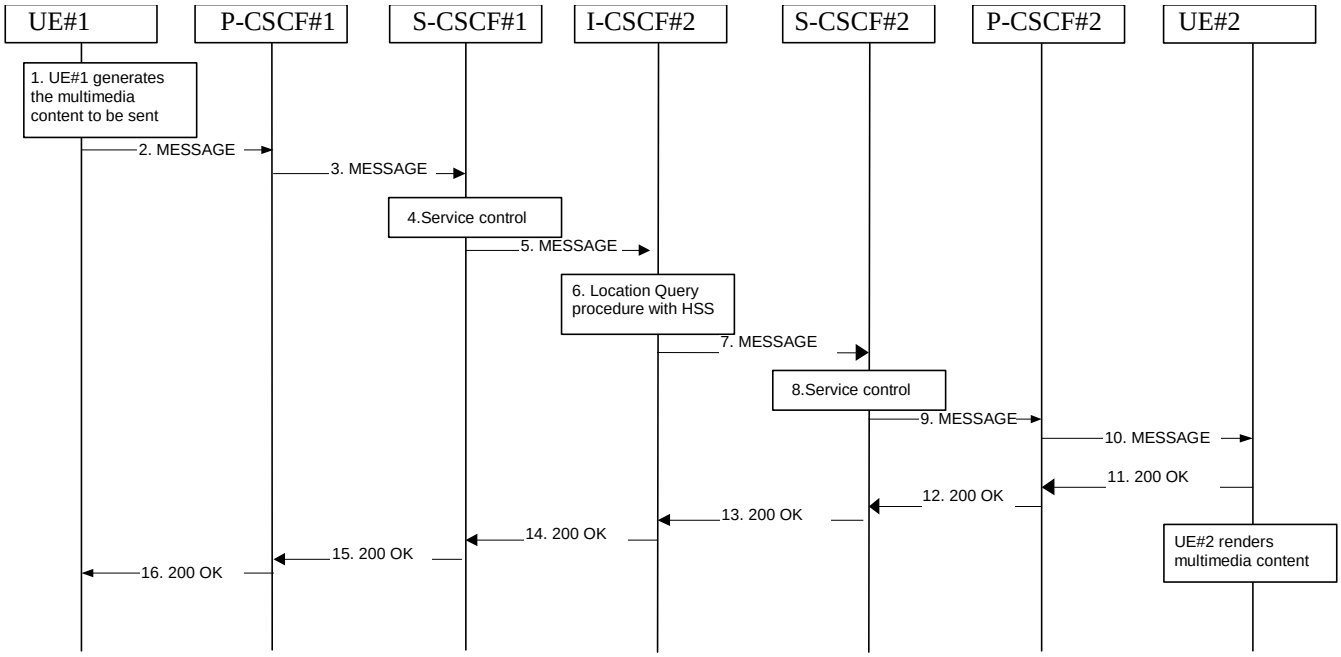

Figure 5.47: Immediate Messaging procedure to registered public user identity

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 ~~performs~~ 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~~performs~~ 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.
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 ~~200OK~~ response that indicates that the destination entity has received the MESSAGE request. The ~~200OK~~ response traverses the transaction path back to UE#1.

5.16.1.1.2 Immediate messaging procedure to unregistered public user identity

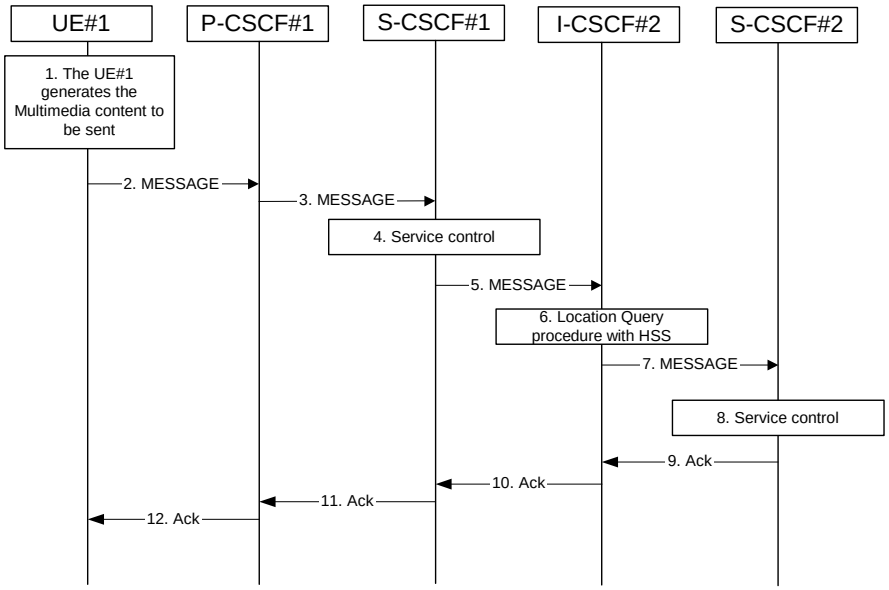

Figure 5.x.1: Immediate messaging to unregistered public user identity, service control invoked

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.

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

3GPP TSG-SA2 Meeting #32
San Diego, US, May 12-16, 2003

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CHANGE REQUEST

⌘ **23.228** **CR** **297** ⌘ **rev** **3** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	AS use of the MRFC
Source:	⌘	Lucent Technologies, Nokia
Work item code:	⌘	IMS2
Date:	⌘	16/05/2003
Category:	⌘	**B**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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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:	⌘	TS 23.002 describes the basic functionality of the Ut reference point: it enables the user to manage information related to his services. Such as creation and assignment of Public Service Identities, management of authorization policies that are used e.g. by Presence service, conference policy management, etc. TS 23.228 describes the usage of MRF for services requiring user-plane functions, e.g. conferencing. It is currently unclear how the service data manipulation functions provided by the Mt interface are used for services utilizing the resources of MRF.
Summary of change:	⌘	The relation of the MRFC and the AS is clarified with respect to using Ut capabilities for services requiring user-plane functions.
Consequences if not approved:	⌘	

Clauses affected:	⌘	

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

Other comments:	⌘	

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5.14 Interactions involving the MRFC/MRFP

The MRFC/MRFP are resources of the IMS that provide support for bearer related services such as for example multi-party sessions, announcements to a user or bearer transcoding. This section describes how the resources of the MRFC/MRFP are used.

5.14.1 Interactions between the UE and the MRFC

In some cases an operator may wish to make an MRFC available directly to a UE, for example to support ad-hoc multi-party sessions to be initiated by the UE. In this case, the operator advertises the name of one or more MRFCs and a UE will invite an MRFC to a session. The session invitation would need to contain additional information indicating the specific capabilities (e.g., multi-party) desired. A conference ID would be assigned by the MRFC and returned to the UE. This would then be used by the UE in subsequent interactions with the MRFC and other UEs participating in the session.

There are two approaches to invite new participants to the multiparty session. In the first, a UE directs other UEs to join the multiparty session based on the use of the SIP REFER method. This allows session invitations with consultation. In the second method, the MRFC uses information received from a UE e.g. within a list of session participants to invite other UEs to the multiparty session. This allows session invitations without consultation.

5.14.2 Service control based interactions ~~with~~ between the MRFC and the AS

The MRFC/MRFP resources may also be used, based on service control in an IMS network, for services such as multiparty sessions, announcements or transcoding. In this case an Application Server interacts with an MRFC. Session control messages are passed between the AS and the MRFC via the S-CSCF.

There are two approaches for the AS to control the sessions. In the first, the AS uses 3rd party call control. The second approach uses the SIP REFER method.

In either case, the appropriate service in the AS would be triggered by a UE initiated SIP message containing information indicating the specific capabilities desired. This session invitation would also carry additional information indicating the specific capabilities (e.g., multi-party). A conference ID would be assigned by the MRFC and would be used by the AS in subsequent interactions with the MRFC in INVITE messages connecting other endpoints.

3rd party call control can also be used to invite announcement and transcoding services. That is, the AS will send an INVITE to the MRFC with an indication of the capability being requested and with additional information related to the specific service such as identification of the announcement to be played or identification of the specific transcoding requirements.

5.14.3 Interactions for services using both the Ut interface and MRFC capabilities

Network services hosted on an AS and configurable by the user via the Ut interface may also use the capabilities provided by the MRFC. For this case the AS either supports MRFC capabilities, or communicates with an MRFC.

Communications across the Ut interface between the UE and the AS allow the UE to securely manage and configure data for such services (e.g. conference type services). Means for the AS to propagate this management and configuration information to the MRFC is not standardized in this Release.

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San Diego, USA, 12-16 May 2003

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CHANGE REQUEST

⌘ **23.228** **CR** **286** ⌘ **rev** **3** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	IMS Group Management
Source:	⌘	Siemens
Work item code:	⌘	IMS2
Date:	⌘	15/052003
Category:	⌘	**B**
Release:	⌘	Rel-6

Use one of the following categories:
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A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
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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:	⌘	IMS Group Management Requirements, as specified in TS 22.250, are not yet covered by stage 2 specifications.
Summary of change:	⌘	A basic stage 2 description for IMS Group Management is added to TS 23.228.
Consequences if not approved:	⌘	Stage 1 requirements not covered in stage 2 specifications.

Clauses affected:	⌘	2, 3.2, 4.10(new)			
		Y	**N**		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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FIRST SET OF CHANGES

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 22.250: “IP Multimedia Subsystem (IMS) group management”; Stage 1”

3 Definitions, symbols and abbreviations

3.1 Definitions

Refer to TS 23.002 [1] for the definitions of some terms used in this document.

For the purposes of the present document the following additional definitions apply.

IP-Connectivity Access Network: refers to the collection of network entities and interfaces that provides the underlying IP transport connectivity between the UE and the IMS entities**.** An example of an "IP-Connectivity Access Network" is GPRS.

Subscriber: A Subscriber is an entity (comprising one or more users) that is engaged in a Subscription with a service provider. The subscriber is allowed to subscribe and unsubscribe services, to register a user or a list of user authorised to enjoy these services, and also to set the limits relative to the use that users make of these services.

3.2 Symbols

For the purposes of the present document the following symbols apply:

Cx	Reference Point between a CSCF and an HSS.
Dx	Reference Point between an I-CSCF and an SLF.
Gi	Reference point between GPRS and an external packet data network Gm Reference Point between a UE and a P-CSCF.
ISC	Reference Point between a CSCF and an Application Server.
Iu	Interface between the RNS and the core network. It is also considered as a reference point.
Le	Reference Point between an AS and a GMLC
Mb	Reference Point to IPv6 network services.
Mg	Reference Point between an MGCF and a CSCF.
Mi	Reference Point between a CSCF and a BGCF.
Mj	Reference Point beetween a BGCF and an MGCF.
Mk	Reference Point betweeen a BGCF and another BGCF.
Mm	Reference Point between a CSCF and an IP multimedia network.

Mr	Reference Point between an CSCF and an MRFC.
Mw	Reference Point between a CSCF and another CSCF.
Sh	Reference Point between an AS (SIP-AS or OSA-CSCF) and an HSS.
Si	Reference Point between an IM-SSF and an HSS.
Ut	Reference Point between UE and an Application Server.

NEXT CHANGE

4.9 Charging Concepts

IM CN subsystem functional elements provide support for offline and online charging. This includes support for charging correlation, e.g. between IM CN subsystem and PS domain. The charging architecture, charging principles and charging data for IM CN subsystem are described in 3GPP TS 32.200 [25] and 3GPP TS 32.225 [26]. The charging correlation information between IM CN subsystem and PS domain are also described in 3GPP TS 24.229 [10a] and 3GPP TS 29.207 [11a].

4.10 IMS group management concepts

This clause describes architectural concepts to fulfil the requirements for IMS Group Management described in TS 22.250 [31].

4.10.1 IMS group administration

The capabilities required for IMS group management are defined in clause 5.4 of TS 22.250 [31]. The Ut reference point is used to manage groups from the UE. This does not preclude the use of other mechanisms for group management, e.g. using OSA or OA&M mechanisms; the details of these other mechanisms are out of scope of this document.

4.10.2 Group identifiers

Each group shall be addressable by a globally unique group identifier. The group identifier shall take the form of a Public Service Identifier.

3GPP TSG-SA2 Meeting #32
San Diego, USA, 12-16 May 2003

Tdoc S2-032114 ⌘

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **311** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	S-CSCF requirements at registration
Source:	⌘	Nortel Networks
Work item code:	⌘	IMS-CCR
Date:	⌘	12/05/2003
Category:	⌘	**A**
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 text in 23.228 5.2.1 'requirements considered for registration', reads: 6. The Serving-CSCF understands a service profile and the address of the functionality of the Proxy-CSCF. It is not clear what is meant by "understands" and "address of the functionality of the P-CSCF" that the S-CSCF knows about and how is this relevant for registration.
Summary of change:	⌘	State that the S-CSCF has access to a service profile of the user, and that the S-CSCF knows how to reach the P-CSCF currently serving the user.
Consequences if not approved:	⌘	Unclear text in the specs.

Clauses affected:	⌘	5.2.1

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.

5.2.1 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 ~~understands~~ is able to retrieve a service profile of the user who has IMS subscription. ~~and~~ The Serving-CSCF knows ~~the address of the~~ how to reach the ~~functionality of 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. It shall be possible to register multiple public identities via single IMS registration procedure from the UE.

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

10. 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.

3GPP TSG-SA2 Meeting #32
San Diego, USA, 12-16 May 2003

Tdoc S2-032113 ⌘

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **319** ⌘ **rev** **-** ⌘ Current version: **5.8.0** ⌘

*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:	⌘	S-CSCF requirements at registration
Source:	⌘	Nortel Networks
Work item code:	⌘	IMS-CCR
Date:	⌘	12/05/2003
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:	⌘	The text in 23.228 5.2.1 'requirements considered for registration', reads: 6. The Serving-CSCF understands a service profile and the address of the functionality of the Proxy-CSCF. It is not clear what is meant by "understands" and "address of the functionality of the P-CSCF" that the S-CSCF knows about and how is this relevant for registration.
Summary of change:	⌘	State that the S-CSCF has access to a service profile of the user, and that the S-CSCF knows how to reach the P-CSCF currently serving the user.
Consequences if not approved:	⌘	Unclear text in the specs. The current text is hardly understandable and completely misleading.

Clauses affected:	⌘	5.2.1

		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:
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Below is a brief summary:

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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.

5.2.1 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 ~~understands~~ a service profile of the user who has IMS subscription. ~~and~~ ~~t~~The Serving-CSCF knows ~~address of the functionality of~~ 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.

-In order to support pre-Rel 5 UICC accessing IMS services, a temporary public user identity is generated using IMSI. It is strongly recommended that the temporary public user identity be set to barred for IMS non-registration procedures.

8. When a Temporary Public Identity has been used to register an IMS user, the implicit registration will ensure that the UE, P-CSCF & S-CSCF have public user Identity(s) for all IMS procedures after the initial registration has been completed

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

3GPP TSG-SA WG2 Meeting #32
San Diego, USA, 12-16 May 2003

Tdoc ⌘S2-032108

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **306** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	Public Service Identities Definition
Source:	⌘	Siemens
Work item code:	⌘	IMS2
Date:	⌘	14/05/2003
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 identifier of an IMS Group should be a public service identifier. This was agreed at SA2#31 (CR 286R2). However, the current definition of a public service identifier (PSI) is too restrictive for that purpose, as it associates a PSI with a particular service. However IMS Group Management allows to use the same group for multiple services. Moreover, the term service is not well-defined in this context.
Summary of change:	⌘	The definition of a public service identity is modified to include the possibility to identify a group. A PSI is coupled to an AS rather than to a particular service.
Consequences if not approved:	⌘	Contradictory text within TS 23.228.

Clauses affected:	⌘	4.3.6

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

⌘

Other comments: ⌘

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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.

4.3.6 Public Service Identities

With the introduction of standardized presence, messaging, conferencing, and group service capabilities in IM CN subsystem, there is a need for Public Service Identities. These identities are different from the Public User Identities in the respect that they identify services, which are hosted by application servers. In particular, Public Service Identities are used to identify groups, see clause 4.10. For example ~~,~~a ~~in~~ chat-type service~~s, there is~~ may use a Public Service Identity (e.g. sip:chatlist_X@example.com) to which the users establish a session to be able to send and receive messages from other session participants.

The IM CN subsystem shall provide the capability for users to create, manage, and use Public Service Identities under control of AS. It shall be possible to create statically and dynamically a Public Service Identity.

Each Public Service Identity~~ies~~ is hosted~~are~~ by~~associated with~~ an application server ~~service~~, which~~. The application server hosts the Public Service Identity and~~executes the service specific ~~service~~ logic as identified by the Public Service Identity.

The IM CN Subsystem shall provide capability of routing IMS messages using Public Service Identity.

3GPP TSG-SA2 Meeting #32
San Diego, USA, 12 - 16.05.2003

S2-032107

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **302'** ⌘ **1** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	Clarifications on multiple registrations
Source:	⌘	Nokia
Work item code:	⌘	IMS2
Date:	⌘	15/05/2003
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:	⌘	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. In order to clarify the handling of the multiple registrations in the HSS some revisions are proposed.
Summary of change:	⌘	It is clarified in the clause 4.3.3.4 that if an IMS user has a public user identity shared across the multiple private user identities the public user identity shall be shared by all of those private user identities within the IMS subscription.
Consequences if not approved:	⌘	

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.

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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 ******

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.

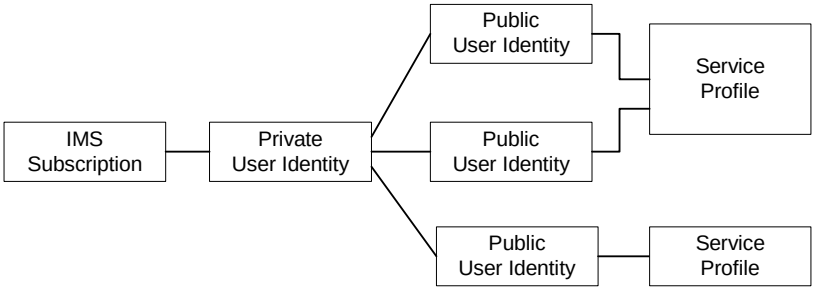

Figure 4.5: Relationship of the private user identity and public user identities

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.

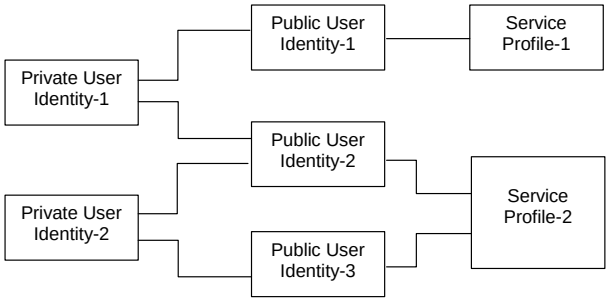

Figure 4.6 – The relation of a shared Public User Identity (Public-ID-2) and Private User Identities

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.

3GPP TSG–SA2 Meeting #32
San Diego, USA, 12th to 16th May 2003

***Tdoc* ⌘S2-032104~~052~~**

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CHANGE REQUEST

⌘ **23.228** **CR** **317** ⌘ **rev** **1-** ⌘ Current version: **5.8.0** ⌘

*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 [X]

Title:	⌘	Implicit registration with multiple Service profiles
Source:	⌘	Orange
Work item code:	⌘	IMS-CCR
Date:	⌘	23/04/2003
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:	⌘	Currently, it is not clear that multiple Service profiles may be stored during registration in case of implicit registration.
Summary of change:	⌘	This document proposes that the S-CSCF shall store during registration all the Service profiles associated with the public user identities~~y~~ being registered and allow the session establishment for these identities after the successful registration.
Consequences if not approved:	⌘	At session establishment for an implicitly registered identity, the S-CSCF will not be able to validate the Service profile. The S-CSCF will have to request the downloading of the Service profile from the HSS, which will increase the signalling messages on the Cx interface (and be repeated at each session establishment for each implicitly registered identity).

Clauses affected:	⌘	5.2.1a, 5.2.2.3, 5.2.2.4, 5.2.2.5

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 co

*** FIRST MODIFICATION ***

5.2.1a Implicit Registration

When an user has a set of public user identities defined to be implicitly registered via single IMS registration of one of the public user identity's in that set, it is considered to be an Implicit Registration. No single public identity shall be considered as a master to the other public user identities. Figure 5.2.1a shows a simple diagram of implicit registration and public user identities. In order to support this function, it is required that:

- HSS has the set of public user identities that are part of implicit registration.
- Cx reference point between S-CSCF and HSS shall support download of all public user identities associated with the implicit registration, during registration of any of the single public user identities within the set.
- When one of the public user identities within the set is registered, all Public user identities associated with the implicit registration are registered at the same time.
- When one of the public user identities within the set is de-registered, all public user identities that have been implicitly registered are de-registered at the same time.
- Public user identities belonging to an implicit registration set may point to different service profiles; or some of these public user identities may point to the same service profile.
- When a public user identity belongs to an implicit registration set, it can not be registered or de-registered individually without the public user identity being removed from the implicit registration list.
- All IMS related registration timers should apply to the set of implicitly registered public user identities
- S-CSCF, P-CSCF and UE shall be notified of the set of public user identities belonging to the implicitly registered function. Session set up shall not be allowed for the implicitly registered public user identities until the entities are updated, except for the explicitly registered public user identity.
- The S-CSCF shall store during registration all the Service profiles corresponding to the public user identities being registered.
- When a public user identity is barred from IMS communications, only the HSS and S-CSCF shall have access to this public user identity,

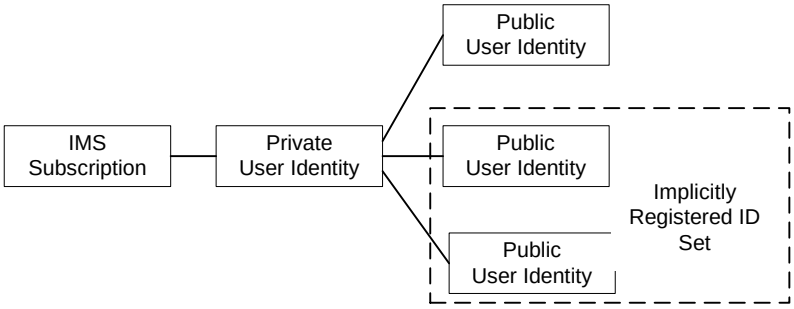

Figure 5.2.1a Relationship of public user identities when implicitly registered

5.2.1a.1 Implicit Registration for UE without ISIM

In case an UE is registering in the IMS without ISIM, it shall require the network's assistance to register atleast one public user identity, which is used for session establishment & IMS signalling. Implicit registration shall be used as part of a mandatory function for these ISIM-less UEs to register the public user identity(s). In addition to the functions defined in section 5.2.1a, the following additional functions are required for this scenario.

- The Temporary public identity shall be used for initial registration process
- It shall be defined in HSS that if the user does not have implicit registration activated then the user shall not be allowed to register in the IMS using the Temporary public user identity.

*** END OF MODIFICATION ***

3GPP TSG–SA2 Meeting #32
San Diego, USA, 12th to 16th May 2003

***Tdoc* ⌘S2-032103~~049~~**

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **314** ⌘ **rev** **1-** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	Barring and roaming restrictions
Source:	⌘	Orange
Work item code:	⌘	IMS-2
Date:	⌘	23/04/2003
Category:	⌘	**A**
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, it is not clear how and when roaming restrictions are enforced within the procedures.
Summary of change:	⌘	This document proposes to add the following sentence into the registration requirements: The HSS shall support the possibility to restrict a user from getting access to IM CN Subsystem from unauthorized visited networks. Also, clarify in the registration flow, at which step the S-CSCF stores the P-CSCF network ID. -
Consequences if not approved:	⌘	roaming restrictions will not be clearly defined

Clauses affected:	⌘	5.2.1, 5.2.2

	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:

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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 co

***FIRST MODIFICATION ***

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 understands a service profile and the address of the functionality of the Proxy-CSCF.

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~~8. It shall be possible to register multiple public identities via single IMS registration procedure from the UE.

~~9.~~10. It shall be possible to register a Public User Identity that is simultaneously shared across multiple contact addresses via IMS registration procedures.

~~10.~~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.

*** NEXT MODIFICATION ***

5.2.2 Registration flows

5.2.2.1 Requirements to consider for registration

The additional requirement for the registration information flow for this section is:

1. A Serving-CSCF is assigned at registration, this does not preclude additional Serving-CSCFs or change of CSCF at a later date. Procedures for use of additional CSCFs are not standardised in this release.

5.2.2.2 Assumptions

The following are considered as assumptions for the registration procedures as described in subclause 5.3.2.3:

1. IP-CAN bearer is already established for signalling and a mechanism exists for the first REGISTER message to be forwarded to the proxy.

2. The I-CSCF shall use a mechanism for determining the Serving-CSCF address based on the required capabilities. The I-CSCF obtains the name of the S-CSCF from its role as an S-CSCF selector (Figure 5-1) for the determination and allocation of the Serving-CSCF during registration.

3. The decision for selecting the S-CSCF for the user in the network is made in the I-CSCF.

4. A role of the I-CSCF is the S-CSCF selection.

In the information flows described in subclauses 5.2.2.3 and 5.2.2.4, there is a mechanism to resolve a name and address. The text in the information flows indicates when the name-address resolution mechanism is utilised. These flows do not take into account security features such as user authentication. The description of the impact of IMS security features is done in [19] 33.203.

5.2.2.3 Registration information flow – User not registered

The application level registration can be initiated after the registration to the access is performed, and after IP connectivity for the signalling has been gained from the access network. For the purpose of the registration information flows, the user is considered to be always roaming. For user roaming in their home network, the home network shall perform the role of the visited network elements and the home network elements.

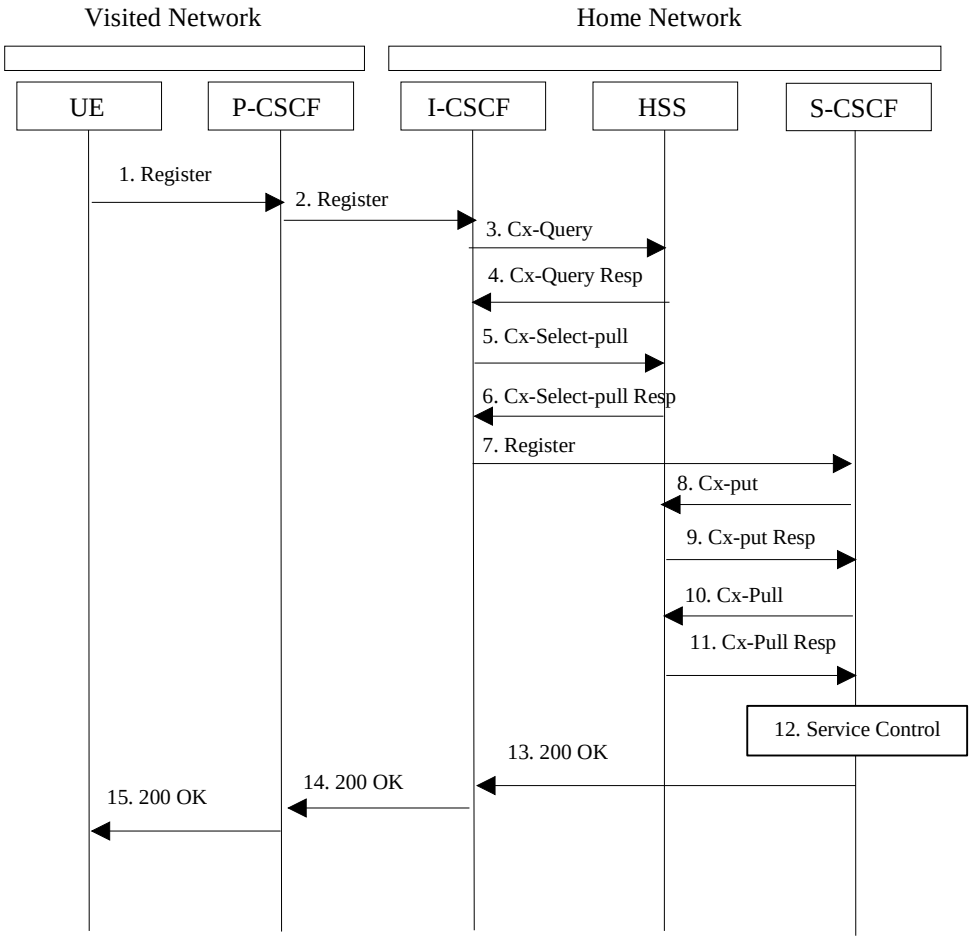

Figure 5.1: Registration – User not registered

1. After the UE has obtained IP connectivity, it can perform the IM registration. To do so, the UE sends the Register information flow to the proxy (public user identity, private user identity, home network domain name, UE IP address).

2. Upon receipt of the register information flow, the P-CSCF shall examine the “home domain name” to discover the entry point to the home network (i.e. the I-CSCF). The proxy shall send the Register information flow to the I-

CSCF (P-CSCF address/name, public user identity, private user identity, P-CSCF network identifier, UE IP address). A name-address resolution mechanism is utilised in order to determine the address of the home network from the home domain name. The P-CSCF network identifier is a string that identifies at the home network, the network where the P-CSCF is located (e.g., the P-CSCF network identifier may be the domain name of the P-CSCF network).

3. The I-CSCF shall send the Cx-Query information flow to the HSS (public user identity, private user identity, P-CSCF network identifier).

   The HSS shall check whether the user is registered already. The HSS shall indicate whether the user is allowed to register in that P-CSCF network (identified by the P-CSCF network identifier) according to the User subscription and operator limitations/restrictions if any.

4. Cx-Query Resp is sent from the HSS to the I-CSCF. It shall contain the S-CSCF name, if it is known by the HSS, and the S-CSCF capabilities, if it is necessary to select a new S-CSCF. When the response contains both S-CSCF name and capabilities the I-CSCF may perform a new assignment. When only capabilities are returned the I-CSCF will continue proceeding according to step 5. If the checking in HSS was not successful the Cx-Query Resp shall reject the registration attempt.

5. If the I-CSCF has not been provided with the name of the S-CSCF then the I-CSCF shall send Cx-Select-Pull (public user identity, private user identity) to the HSS to request the information related to the required S-CSCF capabilities which shall be input into the S-CSCF selection function.

6. On receipt of the Cx-Select-Pull, the HSS shall send Cx-Select-Pull Resp (required S-CSCF capabilities) to the I-CSCF.

7. The I-CSCF, using the name of the S-CSCF, shall determine the address of the S-CSCF through a name-address resolution mechanism. The I-CSCF also determines the name of a suitable home network contact point, possibly based on information received from the HSS. The home network contact point may either be the S-CSCF itself, or a suitable I-CSCF(THIG) in case network configuration hiding is desired. If an I-CSCF(THIG) is chosen as the home network contact point for implementing network configuration hiding, it may be distinct from the I-CSCF that appears in this registration flow, and it shall be capable of deriving the S-CSCF name from the home contact information. I-CSCF shall then send the register information flow (P-CSCF address/name, public user identity, private user identity, P-CSCF network identifier, UE IP address, I-CSCF(THIG) in case network configuration hiding is desired) to the selected S-CSCF. The home network contact point will be used by the P-CSCF to forward session initiation signalling to the home network.

8. The S-CSCF shall send Cx-Put (public user identity, private user identity, S-CSCF name) to the HSS. The HSS stores the S-CSCF name for that user.

9. The HSS shall send Cx-Put Resp to the S-CSCF to acknowledge the sending of Cx-Put.

10. On receipt of the Cx-Put Resp information flow, the S-CSCF shall send the Cx-Pull information flow (public user identity, private user identity) to the HSS in order to be able to download the relevant information from the user profile to the S-CSCF. The S-CSCF shall store the P-CSCF address/name, as supplied by the visited network. This represents the address/name that the home network forwards the subsequent terminating session signalling to for the UE. The S-CSCF shall store the P-CSCF Network ID information.

11. The HSS shall return the information flow Cx-Pull Resp (user information) to the S-CSCF. The user information passed from the HSS to the S-CSCF shall include one or more names/addresses information which can be used to access the platform(s) used for service control while the user is registered at this S-CSCF. The S-CSCF shall store the information for the indicated user. In addition to the names/addresses information, security information may also be sent for use within the S-CSCF.

12. Based on the filter criteria, the S-CSCF shall send register information to the service control platform and perform whatever service control procedures are appropriate.

13. The S-CSCF shall return the 200 OK information flow (home network contact information) to the I-CSCF. If an I-CSCF is chosen as the home network contact point for implementing network configuration hiding, the I-CSCF shall encrypt the S-CSCF address in the home network contact information.

14. The I-CSCF shall send information flow 200 OK (home network contact information) to the P-CSCF. The I-CSCF shall release all registration information after sending information flow 200 OK.

15. The P-CSCF shall store the home network contact information, and shall send information flow 200 OK to the UE.

Note: The encryption mechanism for implementing network configuration hiding is specified in TS 33.203.

5.2.2.4 Re-Registration information flow – User currently registered

Periodic application level re-registration is initiated by the UE either to refresh an existing registration or in response to a change in the registration status of the UE. Re-registration follows the same process as defined in subclause 5.2.2.3 "Registration Information Flow – User not registered". When initiated by the UE, based on the registration time established during the previous registration, the UE shall keep a timer shorter than the registration related timer in the network.

Note: if the UE does not re-register, any active sessions may be deactivated.

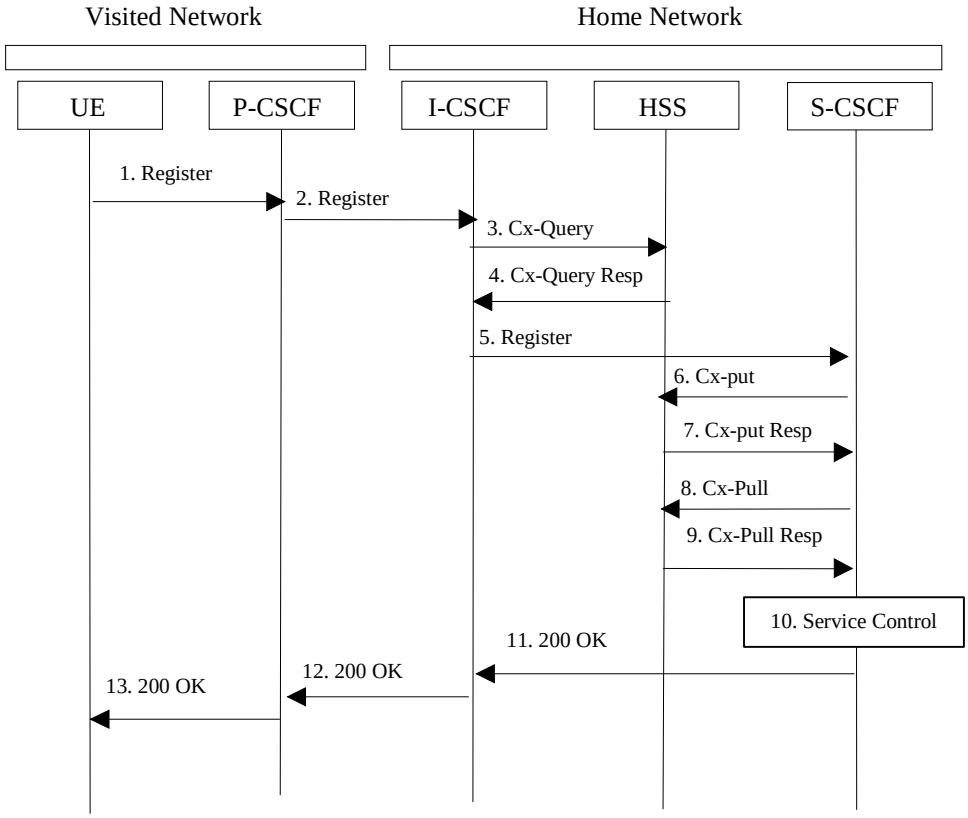

Figure 5.2: Re-registration - user currently registered

1. Prior to expiry of the agreed registration timer, the UE initiates a re-registration. To re-register, the UE sends a new REGISTER request. The UE sends the REGISTER information flow to the proxy (public user identity, private user identity, home network domain name, UE IP address).

2. Upon receipt of the register information flow, the P-CSCF shall examine the "home domain name" to discover the entry point to the home network (i.e. the I-CSCF). The proxy does not use the entry point cached from prior registrations. The proxy shall send the Register information flow to the I-CSCF (P-CSCF address/name, public user identity, private user identity, P-CSCF network identifier, UE IP address). A name-address resolution mechanism is utilised in order to determine the address of the home network from the home domain name. The P-CSCF network identifier is a string that identifies at the home network, the network where the P-CSCF is located (e.g., the P-CSCF network identifier may be the domain name of the P-CSCF network).

3. The I-CSCF shall send the Cx-Query information flow to the HSS (public user identity, private user identity and P-CSCF network identifier).

4. The HSS shall check whether the user is registered already and return an indication indicating that an S-CSCF is assigned. The Cx-Query Resp (indication of entry contact point, e.g. S-CSCF) is sent from the HSS to the I-CSCF.

5. The I-CSCF, using the name of the S-CSCF, shall determine the address of the S-CSCF through a name-address resolution mechanism. The I-CSCF also determines the name of a suitable home network contact point, possibly based on information received from the HSS. The home network contact point may either be the S-CSCF itself, or a suitable I-CSCF(THIG) in case network configuration hiding is desired. If an I-CSCF(THIG) is chosen as the home network contact point for implementing network configuration hiding, it may be distinct from the I-CSCF that appears in this registration flow, and it shall be capable of deriving the S-CSCF name from the home contact information. I-CSCF shall then send the register information flow (P-CSCF address/name, public user identity, private user identity, P-CSCF network identifier, UE IP address, I-CSCF(THIG) in case network configuration hiding is desired) to the selected S-CSCF. The home network contact point will be used by the P-CSCF to forward session initiation signalling to the home network.

6. The S-CSCF shall send Cx-Put (public user identity, private user identity, S-CSCF name) to the HSS. The HSS stores the S-CSCF name for that user. Note: Optionally as an optimisation, the S-CSCF can detect that this is a re-registration and omit the Cx-Put request.

7. The HSS shall send Cx-Put Resp to the S-CSCF to acknowledge the sending of Cx-Put.

8. On receipt of the Cx-Put Resp information flow, the S-CSCF shall send the Cx-Pull information flow (public user identity, private user identity) to the HSS in order to be able to download the relevant information from the user profile to the S-CSCF. The S-CSCF shall store the P-CSCF address/name, as supplied by the visited network. This represents the address/name that the home network forwards the subsequent terminating session signalling to for the UE. Note: Optionally as an optimisation, the S-CSCF can detect that this a re-registration and omit the Cx-Pull request.

9. The HSS shall return the information flow Cx-Pull-Resp (user information) to the S-CSCF. The S-CSCF shall store the user information for that indicated user.

10. Based on the filter criteria, the S-CSCF shall send re-registration information to the service control platform and perform whatever service control procedures are appropriate.

11. The S-CSCF shall return the 200 OK information flow (home network contact information) to the I-CSCF. If an I-CSCF is chosen as the home network contact point for implementing network configuration hiding, the I-CSCF shall encrypt the S-CSCF address in the home network contact information.

12. The I-CSCF shall send information flow 200 OK (home network contact information) to the P-CSCF. The I-CSCF shall release all registration information after sending information flow 200 OK.

13. The P-CSCF shall store the home network contact information, and shall send information flow 200 OK to the UE.

Note: The encryption mechanism for implementing network configuration hiding is specified in TS 33.203.

5.2.2.5 Stored information.

Table 5.1 provides an indication of the information stored in the indicated nodes during and after the registration process.

Table 5.1 Information Storage before, during and after the registration process

Node	Before Registration	During Registration	After Registration
UE - in local network	Credentials Home Domain Proxy Name/Address	Same as before registration	Credentials Home Domain Proxy Name/Address Same as before registration
Proxy-CSCF - in local network	Routing Function	Initial Network Entry point UE Address Public and Private User IDs	Final Network Entry point UE Address Public and Private User IDs
Interrogating-CSCF - in Home network	HSS or SLF Address	Serving-CSCF address/name P-CSCF Network ID Home Network contact Information	No State Information
HSS	User Service Profile	P-CSCF Network ID	Serving-CSCF address/name\
Serving-CSCF (Home)	No state information	HSS Address/name User profile (limited – as per network scenario) Proxy address/name P-CSCF Network ID Public/Private User ID UE IP Address	May have session state Information Same as during registration

*** END OF MODIFICATION ***

3GPP TSG–SA2 Meeting #32
San Diego, USA, 12th to 16th May 2003

***Tdoc* ⌘S2-032102~~048~~**

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **313** ⌘ **rev** **1-** ⌘ Current version: **5.8.0** ⌘

*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:	⌘	Barring and roaming restrictions
Source:	⌘	Orange
Work item code:	⌘	IMS-CCR
Date:	⌘	23/04/2003
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:	⌘	Currently, it is not clear how and when roaming restrictions are enforced within the procedures.
Summary of change:	⌘	This document proposes to add the following sentence into the registration requirements: The HSS shall support the possibility to restrict a user from getting access to IM CN Subsystem from unauthorized visited networks. Also, clarify in the registration flow, at which step the S-CSCF stores the P-CSCF network ID. -
Consequences if not approved:	⌘	roaming restrictions will not be clearly defined

Clauses affected:	⌘	5.2.1, 5.2.2

		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 MODIFICATION ***

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 understands a service profile and the address of the functionality of the Proxy-CSCF.

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.

-In order to support pre-Rel 5 UICC accessing IMS services, a temporary public user identity is generated using IMSI. It is strongly recommended that the temporary public user identity be set to barred for IMS non-registration procedures.

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

98. When a Temporary Public Identity has been used to register an IMS user, the implicit registration will ensure that the UE, P-CSCF & S-CSCF have public user Identity(s) for all IMS procedures after the initial registration has been completed

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

*** NEXT MODIFICATION ***

5.2.2 Registration flows

5.2.2.1 Requirements to consider for registration

The additional requirement for the registration information flow for this section is:

1. A Serving-CSCF is assigned at registration, this does not preclude additional Serving-CSCFs or change of CSCF at a later date. Procedures for use of additional CSCFs are not standardised in this release.

5.2.2.2 Assumptions

The following are considered as assumptions for the registration procedures as described in subclause 5.3.2.3:

1. Radio bearers are already established for signalling and a mechanism exists for the first REGISTER message to be forwarded to the proxy.

2. The I-CSCF shall use a mechanism for determining the Serving-CSCF address based on the required capabilities. The I-CSCF obtains the name of the S-CSCF from its role as an S-CSCF selector (Figure 5-1) for the determination and allocation of the Serving-CSCF during registration.

3. The decision for selecting the S-CSCF for the user in the network is made in the I-CSCF.

4. A role of the I-CSCF is the S-CSCF selection.

In the information flows described in subclauses 5.2.2.3 and 5.2.2.4, there is a mechanism to resolve a name and address. The text in the information flows indicates when the name-address resolution mechanism is utilised. These flows do not take into account security features such as user authentication. The description of the impact of IMS security features is done in [19] 33.203.

5.2.2.3 Registration information flow – User not registered

The application level registration can be initiated after the registration to the access is performed, and after IP connectivity for the signalling has been gained from the access network. For the purpose of the registration information flows, the user is considered to be always roaming. For user roaming in their home network, the home network shall perform the role of the visited network elements and the home network elements.

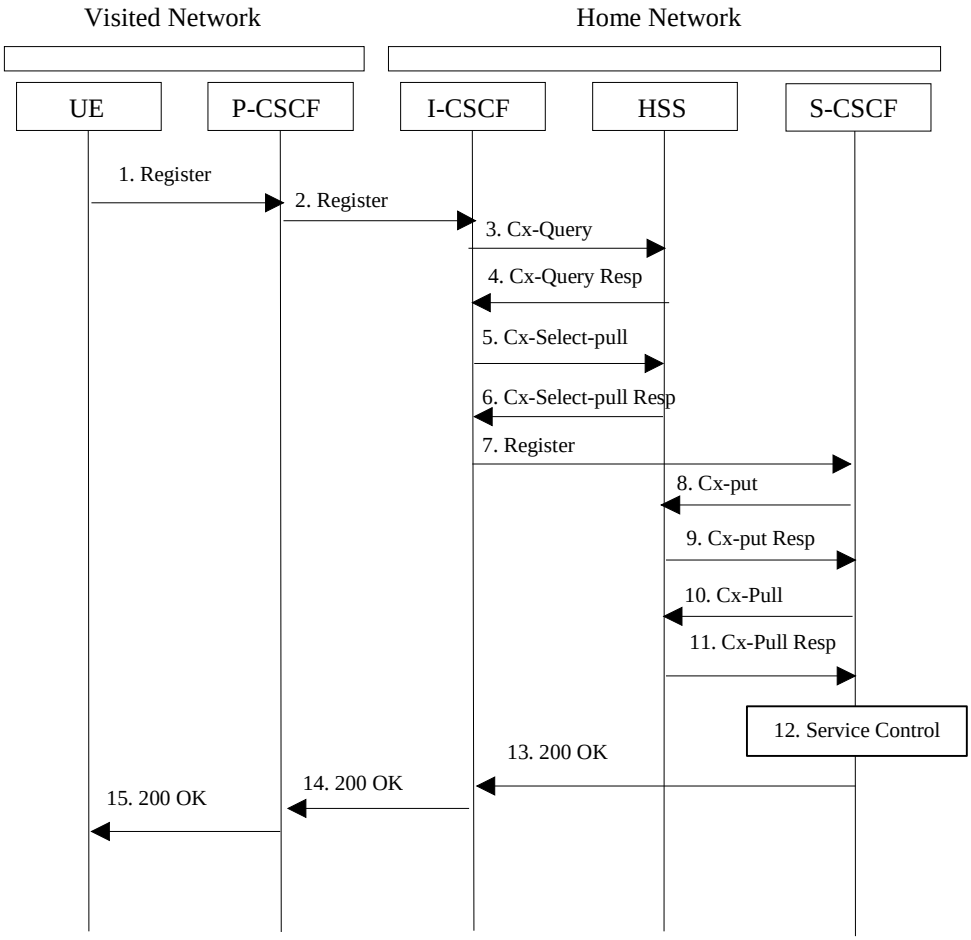

Figure 5.1: Registration – User not registered

1. After the UE has obtained a signalling channel through the access network, it can perform the IM registration. To do so, the UE sends the Register information flow to the proxy (public user identity, private user identity, home network domain name, UE IP address).

2. Upon receipt of the register information flow, the P-CSCF shall examine the “home domain name” to discover the entry point to the home network (i.e. the I-CSCF). The proxy shall send the Register information flow to the I-CSCF (P-CSCF address/name, public user identity, private user identity, P-CSCF network identifier, UE IP address). A name-address resolution mechanism is utilised in order to determine the address of the home network from the home domain name. The P-CSCF network identifier is a string that identifies at the home network, the network where the P-CSCF is located (e.g., the P-CSCF network identifier may be the domain name of the P-CSCF network).

3. The I-CSCF shall send the Cx-Query information flow to the HSS (public user identity, private user identity, P-CSCF network identifier).

   The HSS shall check whether the user is registered already. The HSS shall indicate whether the user is allowed to register in that P-CSCF network (identified by the P-CSCF network identifier) according to the User subscription and operator limitations/restrictions if any.

4. Cx-Query Resp is sent from the HSS to the I-CSCF. It shall contain the S-CSCF name, if it is known by the HSS, and the S-CSCF capabilities, if it is necessary to select a new S-CSCF. When the response contains both S-CSCF name and capabilities the I-CSCF may perform a new assignment. When only capabilities are returned the I-CSCF will continue proceeding according to step 5. If the checking in HSS was not successful the Cx-Query Resp shall reject the registration attempt.

5. If the I-CSCF has not been provided with the name of the S-CSCF then the I-CSCF shall send Cx-Select-Pull (public user identity, private user identity) to the HSS to request the information related to the required S-CSCF capabilities which shall be input into the S-CSCF selection function.

6. On receipt of the Cx-Select-Pull, the HSS shall send Cx-Select-Pull Resp (required S-CSCF capabilities) to the I-CSCF.

7. The I-CSCF, using the name of the S-CSCF, shall determine the address of the S-CSCF through a name-address resolution mechanism. The I-CSCF also determines the name of a suitable home network contact point, possibly based on information received from the HSS. The home network contact point may either be the S-CSCF itself, or a suitable I-CSCF(THIG) in case network configuration hiding is desired. If an I-CSCF(THIG) is chosen as the home network contact point for implementing network configuration hiding, it may be distinct from the I-CSCF that appears in this registration flow, and it shall be capable of deriving the S-CSCF name from the home contact information. I-CSCF shall then send the register information flow (P-CSCF address/name, public user identity, private user identity, P-CSCF network identifier, UE IP address, I-CSCF(THIG) in case network configuration hiding is desired) to the selected S-CSCF. The home network contact point will be used by the P-CSCF to forward session initiation signalling to the home network.

8. The S-CSCF shall send Cx-Put (public user identity, private user identity, S-CSCF name) to the HSS. The HSS stores the S-CSCF name for that user.

9. The HSS shall send Cx-Put Resp to the S-CSCF to acknowledge the sending of Cx-Put.

10. On receipt of the Cx-Put Resp information flow, the S-CSCF shall send the Cx-Pull information flow (public user identity, private user identity) to the HSS in order to be able to download the relevant information from the user profile to the S-CSCF. The S-CSCF shall store the P-CSCF address/name, as supplied by the visited network. This represents the address/name that the home network forwards the subsequent terminating session signalling to for the UE. The S-CSCF shall store the P-CSCF Network ID information.

11. The HSS shall return the information flow Cx-Pull Resp (user information) to the S-CSCF. The user information passed from the HSS to the S-CSCF shall include one or more names/addresses information which can be used to access the platform(s) used for service control while the user is registered at this S-CSCF. The S-CSCF shall store the information for the indicated user. In addition to the names/addresses information, security information may also be sent for use within the S-CSCF.

12. Based on the filter criteria, the S-CSCF shall send register information to the service control platform and perform whatever service control procedures are appropriate.

13. The S-CSCF shall return the 200 OK information flow (home network contact information) to the I-CSCF. If an I-CSCF is chosen as the home network contact point for implementing network configuration hiding, the I-CSCF shall encrypt the S-CSCF address in the home network contact information.

14. The I-CSCF shall send information flow 200 OK (home network contact information) to the P-CSCF. The I-CSCF shall release all registration information after sending information flow 200 OK.

15. The P-CSCF shall store the home network contact information, and shall send information flow 200 OK to the UE.

Note: The encryption mechanism for implementing network configuration hiding is specified in TS 33.203.

5.2.2.4 Re-Registration information flow – User currently registered

Periodic application level re-registration is initiated by the UE either to refresh an existing registration or in response to a change in the registration status of the UE. Re-registration follows the same process as defined in subclause 5.2.2.3 "Registration Information Flow – User not registered". When initiated by the UE, based on the registration time established during the previous registration, the UE shall keep a timer shorter than the registration related timer in the network.

Note: if the UE does not re-register, any active sessions may be deactivated.

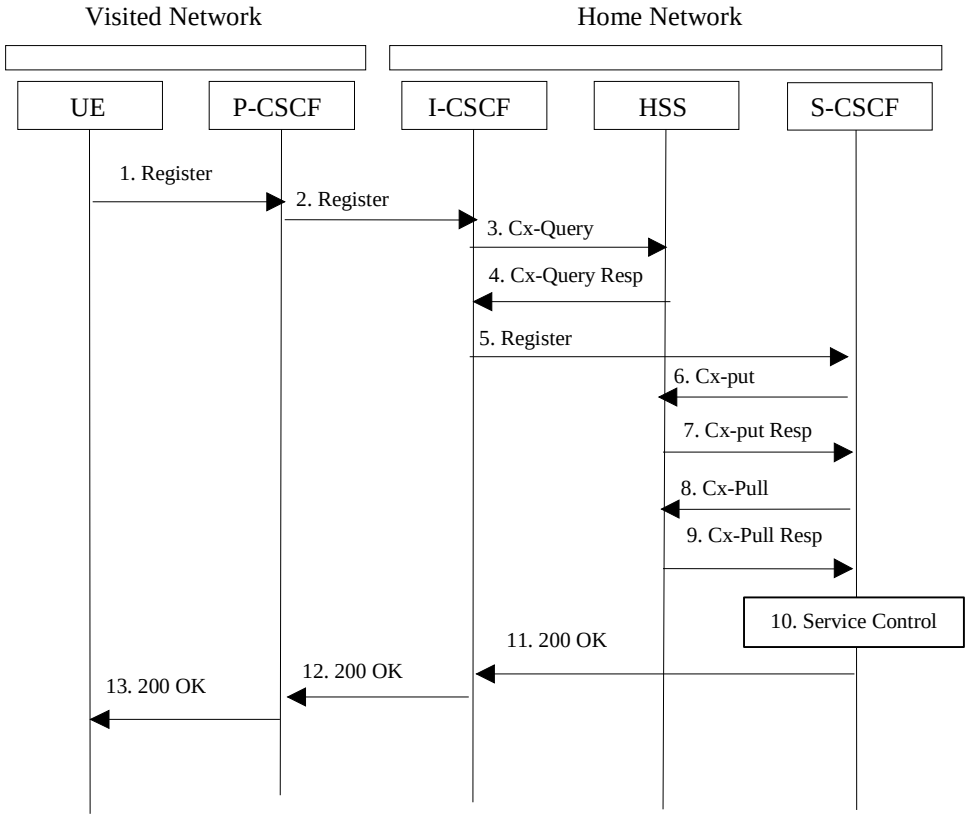

Figure 5.2: Re-registration - user currently registered

1. Prior to expiry of the agreed registration timer, the UE initiates a re-registration. To re-register, the UE sends a new REGISTER request. The UE sends the REGISTER information flow to the proxy (public user identity, private user identity, home network domain name, UE IP address).

2. Upon receipt of the register information flow, the P-CSCF shall examine the "home domain name" to discover the entry point to the home network (i.e. the I-CSCF). The proxy does not use the entry point cached from prior registrations. The proxy shall send the Register information flow to the I-CSCF (P-CSCF address/name, public user identity, private user identity, P-CSCF network identifier, UE IP address). A name-address resolution mechanism is utilised in order to determine the address of the home network from the home domain name. The P-CSCF network identifier is a string that identifies at the home network, the network where the P-CSCF is located (e.g., the P-CSCF network identifier may be the domain name of the P-CSCF network).

3. The I-CSCF shall send the Cx-Query information flow to the HSS (public user identity, private user identity and P-CSCF network identifier).

4. The HSS shall check whether the user is registered already and return an indication indicating that an S-CSCF is assigned. The Cx-Query Resp (indication of entry contact point, e.g. S-CSCF) is sent from the HSS to the I-CSCF.

5. The I-CSCF, using the name of the S-CSCF, shall determine the address of the S-CSCF through a name-address resolution mechanism. The I-CSCF also determines the name of a suitable home network contact point, possibly based on information received from the HSS. The home network contact point may either be the S-CSCF itself, or a suitable I-CSCF(THIG) in case network configuration hiding is desired. If an I-CSCF(THIG) is chosen as the home network contact point for implementing network configuration hiding, it may be distinct from the I-CSCF that appears in this registration flow, and it shall be capable of deriving the S-CSCF name from the home contact information. I-CSCF shall then send the register information flow (P-CSCF address/name, public user identity, private user identity, P-CSCF network identifier, UE IP address, I-CSCF(THIG) in case network configuration hiding is desired) to the selected S-CSCF. The home network contact point will be used by the P-CSCF to forward session initiation signalling to the home network.

6. The S-CSCF shall send Cx-Put (public user identity, private user identity, S-CSCF name) to the HSS. The HSS stores the S-CSCF name for that user. Note: Optionally as an optimisation, the S-CSCF can detect that this is a re-registration and omit the Cx-Put request.

7. The HSS shall send Cx-Put Resp to the S-CSCF to acknowledge the sending of Cx-Put.

8. On receipt of the Cx-Put Resp information flow, the S-CSCF shall send the Cx-Pull information flow (public user identity, private user identity) to the HSS in order to be able to download the relevant information from the user profile to the S-CSCF. The S-CSCF shall store the P-CSCF address/name, as supplied by the visited network. This represents the address/name that the home network forwards the subsequent terminating session signalling to for the UE. Note: Optionally as an optimisation, the S-CSCF can detect that this a re-registration and omit the Cx-Pull request.

9. The HSS shall return the information flow Cx-Pull-Resp (user information) to the S-CSCF. The S-CSCF shall store the user information for that indicated user.

10. Based on the filter criteria, the S-CSCF shall send re-registration information to the service control platform and perform whatever service control procedures are appropriate.

11. The S-CSCF shall return the 200 OK information flow (home network contact information) to the I-CSCF. If an I-CSCF is chosen as the home network contact point for implementing network configuration hiding, the I-CSCF shall encrypt the S-CSCF address in the home network contact information.

12. The I-CSCF shall send information flow 200 OK (home network contact information) to the P-CSCF. The I-CSCF shall release all registration information after sending information flow 200 OK.

13. The P-CSCF shall store the home network contact information, and shall send information flow 200 OK to the UE.

Note: The encryption mechanism for implementing network configuration hiding is specified in TS 33.203.

5.2.2.5 Stored information.

Table 5.1 provides an indication of the information stored in the indicated nodes during and after the registration process.

Table 5.1 Information Storage before, during and after the registration process

Node	Before Registration	During Registration	After Registration
UE - in local network	Credentials Home Domain Proxy Name/Address	Same as before registration	Credentials Home Domain Proxy Name/Address Same as before registration
Proxy-CSCF - in local network	Routing Function	Initial Network Entry point UE Address Public and Private User IDs	Final Network Entry point UE Address Public and Private User IDs
Interrogating-CSCF - in Home network	HSS or SLF Address	Serving-CSCF address/name P-CSCF Network ID Home Network contact Information	No State Information
HSS	User Service Profile	P-CSCF Network ID	Serving-CSCF address/name\
Serving-CSCF (Home)	No state information	HSS Address/name User profile (limited – as per network scenario) Proxy address/name P-CSCF Network ID Public/Private User ID UE IP Address	May have session state Information Same as during registration

***END OF MODIFICATION ***

3GPP TSG-SA2 Meeting #32
San Diego, USA, 12th-16th

Tdoc ⌘S2-032099

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **301** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	Guidelines for the UE to apply IPv6 privacy mechanism in conjunction with IMS
Source:	⌘	Nokia
Work item code:	⌘	IMS-CCR
Date:	⌘	12/05/2003
Category:	⌘	**A**
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:	⌘	TS 23.228 states that upon the UE changes the IP address it uses to access the IM CN subsystem (e.g. as a result of applying IPv6 privacy mechanisms), an automatic re-registration shall be performed in order to update the UE's IP address. Such a change of IP-address and re-registration would result in having to drop active IMS sessions. This causes highly undesirable service experience for users.
Summary of change:	⌘	It is proposed to add a strong recommendation for the UE not to change the IP address used for accessing IMS when engaged in active sessions.
Consequences if not approved:	⌘	IMS sessions would be dropped causing highly undesired discrepancy of service.

Clauses affected:	⌘	4.3.1

		Y	N		
Other specs Affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	This CR is a mirror of the Rel5 CR in CR#300.

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.

********** First and only set of changes **********

4.3.1 Address management

The mechanisms for addressing and routing for access to IM CN subsystem services and issues of general IP address management are discussed in TS 23.221 [7].

According to the procedures defined in TS 23.060 [23], when a UE is assigned an IPv6 prefix, it can change the global IPv6 address it is currently using via the mechanism defined in RFC 3041 [16a], or similar means. When a UE is registered in the IM CN Subsystem with an IP address, any change to this~~e~~ IP address that is used to access the IM CN subsystem will result in dropping the active SIP dialogs, and shall trigger automatic registration. This automatic registration ~~in order to~~ updates the UE's IP address and security association. To avoid disruption of ongoing IM CN subsystem services, the UE should not change the IP address that it uses to access the IM CN subsystem while engaged in active SIP dialogs (e.g. INVITE or SUBSCRIBE-NOTIFY dialogs).

The ability of the User plane and the Control Plane for a single session being able to pass through different GGSNs is not defined in this release.

3GPP TSG-SA2 Meeting #32
San Diego, USA, 12th-16th

Tdoc ⌘S2-032098

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **300** ⌘ **rev** **1** ⌘ Current version: **5.8.0** ⌘

*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:	⌘	Guidelines for the UE to apply IPv6 privacy mechanism in conjunction with IMS
Source:	⌘	Nokia
Work item code:	⌘	IMS-CCR
Date:	⌘	12/05/2003
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:

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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:	⌘	TS 23.228 states that upon the UE changes the IP address it uses to access the IM CN subsystem (e.g. as a result of applying IPv6 privacy mechanisms), an automatic re-registration shall be performed in order to update the UE's IP address. Such a change of IP-address and re-registration would result in having to drop active IMS sessions. This causes highly undesirable service experience for users.
Summary of change:	⌘	It is proposed to add a strong recommendation for the UE not to change the IP address used for accessing IMS when engaged in active sessions.
Consequences if not approved:	⌘	IMS sessions would be dropped causing highly undesired discrepancy of service.

Clauses affected:	⌘	4.3.1

		Y	N		
Other specs Affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	A Rel-6 mirror is provided in CR#301

How to create CRs using this form:

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********** First and only set of changes **********

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The ability of the User plane and the Control Plane for a single session being able to pass through different GGSNs is not defined in this release.

3GPP TSG-SA2 Meeting #32
San Diego, USA, 12 – 16.5.2003

Tdoc S2-032097

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **299** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	IMS corrections
Source:	⌘	Nokia
Work item code:	⌘	IMS-CCR
Date:	⌘	14/05/2003
Category:	⌘	**A**
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:	⌘	Subclause 4.8 contains an error with the specification number. Subclause 5.3.2 contains a case where network initiated de-registration occurs due to SIM lost. Rel-5 does not allows IMS access with SIM. Subclause 5.8 describes procedures related to routing information interrogation. It gives an impression that one could directly route from I-CSCF to MGCF. In addition, what information HSS returns to I-CSCF is not clearly described. Subclause 5.11.2.1 and 5.11.4.1 contains the usage of Remote-Party ID header which does not exist.
Summary of change:	⌘	Errors listed above have been corrected.
Consequences if not approved:	⌘	Misleading stage2 specifications

Clauses affected:	⌘	4.8, 5.3.2, 5.11.2.1, 5.11.4.1

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

Other comments:	⌘	

How to create CRs using this form:

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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.

4.8 Security Concepts

IM CN Subsystem functional elements provide security, as needed, by security methods defined in 3GPP TS ~~32~~33.203[19] and TS 33.210 [20]. If interacting with external Networks, Security Associations are provided in accordance with operator policy.

*** NEXT CHANGE ***

5.3.2 Network initiated de-registration

If an ungraceful session termination occurs (e.g. flat battery or mobile leaves coverage), when a stateful proxy server (such as the S-CSCF) is involved in a session, memory leaks and eventually server failure can occur due to hanging state machines. To ensure stable S-CSCF operation and carrier grade service, a mechanism to handle the ungraceful session termination issue is required. This mechanism should be at the SIP protocol level in order to guarantee access independence for the IM CN subsystem.

The IM CN subsystem can initiate a Network Initiated De-Registration procedures for the following reasons:

- Network Maintenance.
  Forced re-registrations from users, e.g. in case of data inconsistency at node failure, in case of ~~SIM~~ UICC lost, etc. Cancelling the current contexts of the user spread among the IM CN Subsystem network nodes at registration, and imposing a new IM registration solves this condition.

- Network/traffic determined.
  The IM CN subsystem must support a mechanism to avoid duplicate registrations or inconsistent information storage. This case will occur when a user roams to a different network without de-registering the previous one. This case may occur at the change of the roaming agreement parameters between two operators, imposing new service conditions to roamers.

- Application Layer determined.
  The service capability offered by the IM CN Subsystem to the Application Layers may have parameters specifying whether all IM CN subsystem registrations are to be removed, or only those from one or a group of terminals from the user, etc.

- Subscription Management
  The operator must be able to restrict user access to the IM CN subsystem upon detection of contract expiration, removal of IM subscription, fraud detection, etc.In case of changes in service profile of the user, e.g. the user subscribes to new services, it may possible that new S-CSCF capabilities, which are required from the S-CSCF, are not supported by the current S-CSCF which has been assigned to the user. In this case, it shall be possible to actively change the S-CSCF by using the network initiated de-registration by HSS procedure.

The following sections provide scenarios showing SIP application de-registration. Note that these flows have avoided the strict use of specific SIP protocol message names. This is in an attempt to focus on the architectural aspects rather than the protocol.

Two types of network-initiated de-registration procedures are required:

- To deal with registrations expirations.

- To allow the network to force de-registrations following any of the approved possible causes for this to occur.

*** NEXT CHANGE ***

5.8 Procedures related to routing information interrogation

~~The mobile terminated sessions for a user shall be routed either to a Serving-CSCF or to a MGCF (if the user is roaming in a legacy network).~~ When a mobile terminated session set-up arrives at an I-CSCF that is authorised to route sessions, the I-CSCF interrogates the HSS for routing information. The mobile terminated sessions for a user shall be routed to a S-CSCF.

The Cx reference point shall support retrieval of routing information from HSS to I-CSCF. The resulting routing information ~~can be either Serving-CSCF signalling transport parameters (e.g. IP-address)~~is the contact information of S-CSCF.

*** NEXT 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.

5.11.2.1 Signalling requirements for anonymous session establishment

~~If t~~The user shall be able to request~~s~~ that her identity information is not revealed to the terminating party~~the session to be anonymous, the UE must not reveal any identity information other than that required in the Remote-Party-ID header~~.

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.

*** NEXT CHANGE ***

5.11.4 Procedures for providing or blocking identity

Identity is composed of a public user identity and an optional display name:

- The public user identity is used by any user for requesting communications to other users (see section 4.3.3.2).
- The display name is the user's name if available, an indication of privacy or unavailability otherwise. The display name is a text string which may identify the subscriber, the user or the terminal.

This section gives information flows for the procedures for providing the authenticated public user identity and the optional display Name information of the originating party to theterminating party. It also describes the mechanisms for blocking the display of public user identity and optional display name if requested by the originating party.

5.11.4.1 Procedures for providing the authenticated identity of the originating party

Authentication of the subscriber is performed during the registration procedures, as described in section 5.2.2.3. As a result of the registration procedures, one or several public user identity(ies) of the originating party is/are stored in P-CSCF#1. This is shown in the sub-procedure represented in the following information flow in step 1.

When UE#1 attempts to initiate a new session, it includes a public user identity in the INVITE request. P-CSCF#1 verifies that it is present and correct before passing the request to S-CSCF#1.

In the following call flow, it is assumed that no privacy has been required by UE#1.If thepublic user identity supplied by UE#1 in the INVITE request is incorrect, the P-CSCF may reject the request, or may overwrite with the correct URL.

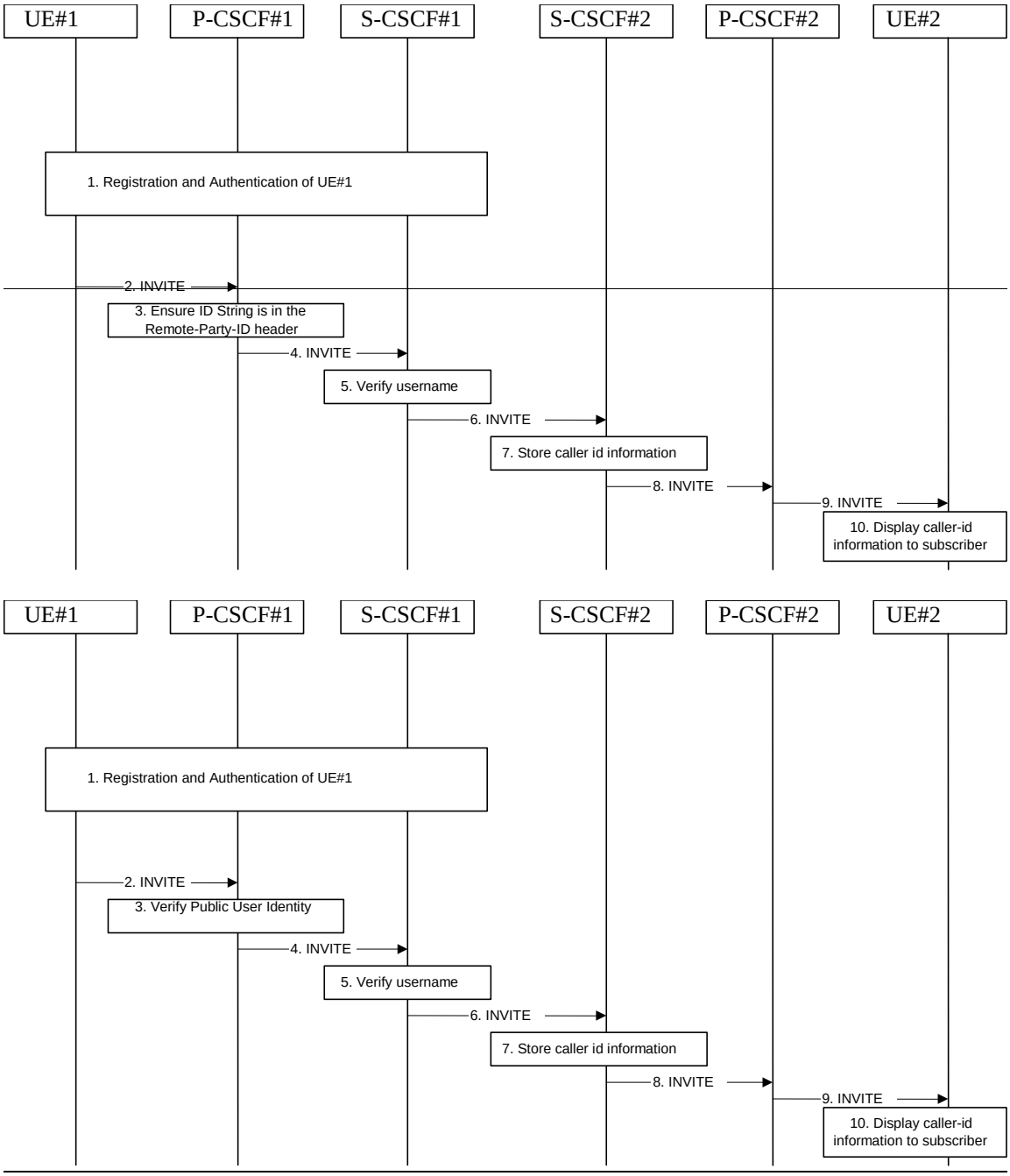

Figure 5.34: Providing the authenticated Identity of the originating party

The detailed procedure is as follows:

1. Registration and authentication of UE#1 is performed.
2. UE#1 initiates a new multi-media session, by sending an INVITE request to P-CSCF#1. This INVITE request includes a public user identity, and may include a display name that may identify the specific person using the UE.
3. P-CSCF#1 checks the public user identity of the originating party, and replaces it (or rejects the request) if it is incorrect.
4. P-CSCF#1 forwards the INVITE request, with the verified public user identity , to S-CSCF#1.
5. S-CSCF#1 invokes whatever service logic is appropriate for this session set up attempt to check in particular that no identity restriction is active.

6. S-CSCF#1 forwards the INVITE request, with verified public user identity and display name of the originting party if present, to S-CSCF#2.

8. S-CSCF#2 forwards the INVITE request to P-CSCF#2.

9. P-CSCF#2 forwards the INVITE request to UE#2.

10. UE#2 displays the public user identity and the display name information (i.e. user-name if available, indication of privacy or unavailability otherwise) to the terminating party.

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San Diego, USA, 12 – 16.5.2003

Tdoc S2-032096

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CHANGE REQUEST

⌘ **23.228** **CR** **298** ⌘ **rev** **1** ⌘ Current version: **5.8.0** ⌘

*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:	⌘	IMS corrections
Source:	⌘	Nokia
Work item code:	⌘	IMS-CCR
Date:	⌘	07/05/2003
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),*
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R99	*(Release 1999)*
Rel-4	*(Release 4)*
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Rel-6	*(Release 6)*

Reason for change:	⌘	Subclause 4.8 contains an error with the specification number. Subclause 5.3.2 contains a case where network initiated de-registration occurs due to SIM lost. Rel-5 does not allows IMS access with SIM. Subclause 5.8 describes procedures related to routing information interrogation. It gives an impression that one could directly route from I-CSCF to MGCF. In addition, what information HSS returns to I-CSCF is not clearly described. Subclause 5.11.2.1 and 5.11.4.1 contains the usage of Remote-Party ID header which does not exist.
Summary of change:	⌘	Errors listed above have been corrected.
Consequences if not approved:	⌘	Misleading stage2 specifications.

Clauses affected:	⌘	4.8, 5.3.2, 5.8, 5.11.2.1, 5.11.4.1

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

Other comments:	⌘	No stage3 changes required.

How to create CRs using this form:

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*** NEXT CHANGE ***

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  The IM CN subsystem must support a mechanism to avoid duplicate registrations or inconsistent information storage. This case will occur when a user roams to a different network without de-registering the previous one. This case may occur at the change of the roaming agreement parameters between two operators, imposing new service conditions to roamers.

- Application Layer determined.
  The service capability offered by the IM CN Subsystem to the Application Layers may have parameters specifying whether all IM CN subsystem registrations are to be removed, or only those from one or a group of terminals from the user, etc.

- Subscription Management
  The operator must be able to restrict user access to the IM CN subsystem upon detection of contract expiration, removal of IM subscription, fraud detection, etc.In case of changes in service profile of the user, e.g. the user subscribes to new services, it may possible that new S-CSCF capabilities, which are required from the S-CSCF, are not supported by the current S-CSCF which has been assigned to the user. In this case, it shall be possible to actively change the S-CSCF by using the network initiated de-registration by HSS procedure.

The following sections provide scenarios showing SIP application de-registration. Note that these flows have avoided the strict use of specific SIP protocol message names. This is in an attempt to focus on the architectural aspects rather than the protocol.

Two types of network-initiated de-registration procedures are required:

- To deal with registrations expirations.

- To allow the network to force de-registrations following any of the approved possible causes for this to occur.

*** NEXT CHANGE ***

5.8 Procedures related to routing information interrogation

~~The mobile terminated sessions for a user shall be routed either to a Serving-CSCF or to a MGCF (if the user is roaming in a legacy network).~~ When a mobile terminated session set-up arrives at an I-CSCF that is authorised to route sessions, the I-CSCF interrogates the HSS for routing information. The mobile terminated sessions for a user shall be routed to a S-CSCF

The Cx reference point shall support retrieval of routing information from HSS to I-CSCF. The resulting routing information is the contact information of S-CSCF~~can be either Serving-CSCF signalling transport parameters (e.g. IP-address)~~.

*** NEXT 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.

5.11.2.1 Signalling requirements for anonymous session establishment

~~If t~~The user shall be able to request~~s the~~ that her identity information is not revealed to the terminating party.~~session to be anonymous, the UE must not reveal any identity information other than that required in the Remote-Party-ID header~~.

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.

*** Last change ***

5.11.4.1 Procedures for providing the authenticated identity of the originating party

Authentication of the subscriber is performed during the registration procedures, as described in section 5.2.2.3. As a result of the registration procedures, one or several public user identity(ies) of the originating party is/are stored in P-CSCF#1. This is shown in the sub-procedure represented in the following information flow in step 1.

When UE#1 attempts to initiate a new session, it includes a public user identity in the INVITE request. P-CSCF#1 verifies that it is present and correct before passing the request to S-CSCF#1.

In the following call flow, it is assumed that no privacy has been required by UE#1.If thepublic user identity supplied by UE#1 in the INVITE request is incorrect, the P-CSCF may reject the request, or may overwrite with the correct URL.

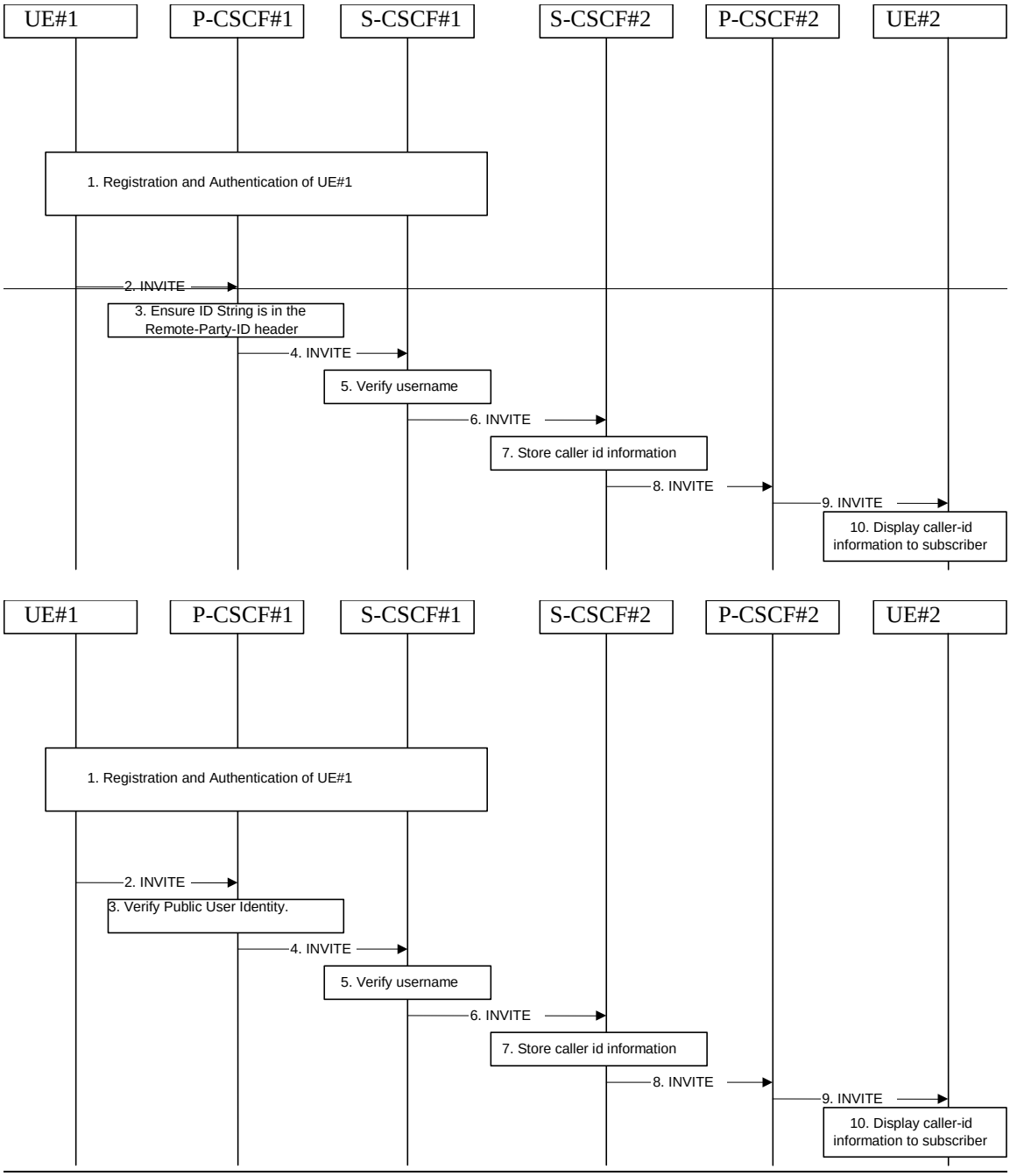

Figure 5.34: Providing the authenticated Identity of the originating party

The detailed procedure is as follows:

1. Registration and authentication of UE#1 is performed.
2. UE#1 initiates a new multi-media session, by sending an INVITE request to P-CSCF#1. This INVITE request includes a public user identity, and may include a display name that may identify the specific person using the UE.
3. P-CSCF#1 checks the public user identity of the originating party, and replaces it (or rejects the request) if it is incorrect.
4. P-CSCF#1 forwards the INVITE request, with the verified public user identity , to S-CSCF#1.
5. S-CSCF#1 invokes whatever service logic is appropriate for this session set up attempt to check in particular that no identity restriction is active.

6. S-CSCF#1 forwards the INVITE request, with verified public user identity and display name of the originting party if present, to S-CSCF#2.

8. S-CSCF#2 forwards the INVITE request to P-CSCF#2.

9. P-CSCF#2 forwards the INVITE request to UE#2.

10. UE#2 displays the public user identity and the display name information (i.e. user-name if available, indication of privacy or unavailability otherwise) to the terminating party.

3GPP TSG-SA2 Meeting #31
Seoul, Korea, 7-11 April 2003

Tdoc ⌘S2-031610

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **272** ⌘ **rev** **5** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	GUP for IMS Subscription Management
Source:	⌘	Nokia
Work item code:	⌘	GUP
Date:	⌘	30/04/2003
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:	⌘	The stage 1 requirement to apply GUP mechanisms to IMS is not yet fulfilled.
Summary of change:	⌘	A new subclause is added to describe the adapdation of the GUP reference architecture to the IM CN Subsystem subscription management. Additionally 3GPP TS 23.240 is added in the References, and GUP in the Abbreviations.
Consequences if not approved:	⌘	Misalignment with IMS stage 1 requirements in the specification TS 22.228.

Clauses affected:	⌘	2, 3.3, 4.X (new subclause)

	Y	N			
Other specs affected:	X		Other core specifications	⌘	29.240 (to be created)
		X	Test specifications		
		X	O&M Specifications		

Other comments: ⌘

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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.

First modified section

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"

3 Definitions, symbols and abbreviations

3.1 Definitions

Refer to TS 23.002 [1] for the definitions of some terms used in this document.

For the purposes of the present document the following additional definitions apply.

IP-Connectivity Access Network: refers to the collection of network entities and interfaces that provides the underlying IP transport connectivity between the UE and the IMS entities**.** An example of an "IP-Connectivity Access Network" is GPRS.

Subscriber: A Subscriber is an entity (comprising one or more users) that is engaged in a Subscription with a service provider. The subscriber is allowed to subscribe and unsubscribe services, to register a user or a list of user authorised to enjoy these services, and also to set the limits relative to the use that users make of these services.

3.2 Symbols

For the purposes of the present document the following symbols apply:

Cx Reference Point between a CSCF and an HSS.
Dx Reference Point between an I-CSCF and an SLF.
Gi Reference point between GPRS and an external packet data network Gm Reference Point between a UE and a P-CSCF.
ISC Reference Point between a CSCF and an Application Server.Iu Interface between the RNS and the core network. It is also considered as a reference point.
Le Reference Point between an AS and a GMLC
Mb Reference Point to IPv6 network services.
Mg Reference Point between an MGCF and a CSCF.
Mi Reference Point between a CSCF and a BGCF.
Mj Reference Point beetween a BGCF and an MGCF.

Mk	Reference Point betweeen a BGCF and another BGCF.
Mm	Reference Point between a CSCF and an IP multimedia network.
Mr	Reference Point between an CSCF and an MRFC.
Mw	Reference Point between a CSCF and another CSCF.
Sh	Reference Point between an AS (SIP-AS or OSA-CSCF) and an HSS.
Si	Reference Point between an IM-SSF and an HSS.

3.3 Abbreviations

For the purposes of the present document the following abbreviations apply. Additional applicable abbreviations can be found in GSM 01.04 [1].

AMR	Adaptive Multi-rate
API	Application Program Interface
AS	Application Server
BCSM	Basic Call State Model
BG	Border Gateway
BGCF	Breakout Gateway Control Function
BS	Bearer Service
CAMEL	Customised Application Mobile Enhanced Logic
CAP	Camel Application Part
CDR	Charging DataRecord
CN	Core Network
CS	Circuit Switched
CSCF	Call Session Control Function
CSE	CAMEL Service Environment
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
ENUM	E.164 Number
GGSN	Gateway GPRS Support Node
GMLC	Gateway Mobile Location Centre
GUP	Generic User Profile
HSS	Home Subscriber Server
I-CSCF	Interrogating-CSCF
IETF	Internet Engineering Task Force
IM	IP Multimedia
IM CN SS	IP Multimedia Core Network Subsystem
IMS	IP Multimedia Core Network Subsystem
IMSI	International Mobile Subscriber Identifier
IP	Internet Protocol
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
IP-CAN	IP-Connectivity Access Network
ISDN	Integrated Services Digital Network
ISIM	IMS SIM
ISP	Internet Service Provider
ISUP	ISDN User Part
MAP	Mobile Application Part
MGCF	Media Gateway Control Function
MGF	Media Gateway Function
NAI	Network Access Identifier
OSA	Open Services Architecture
P-CSCF	Proxy-CSCF
PDF	Policy Decision Function
PDN	Packet Data Network
PDP	Packet Data Protocol e.g., IP
PEF	Policy Enforcement Function
PLMN	Public Land Mobile Network
PSI	Public Service Identity
PSTN	Public Switched Telephone Network
QoS	Quality of Service

RAB	Radio Access Bearer
RFC	Request for Comments
SCS	Service Capability Server
S-CSCF	Serving-CSCF
SGSN	Serving GPRS Support Node
SLF	Subscription Locator Function
SSF	Service Switching Function
SS7	Signalling System 7
SIM	Subscriber Identity Module
SIP	Session Initiation Protocol
SGW	Signalling Gateway
THIG	Topology Hiding Inter-network Gateway
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
URL	Universal Resource Locator
USIM	UMTS SIM

4 IP multimedia subsystem concepts

End of first modified section

Second modified section

4.9 Charging Concepts

IM CN subsystem functional elements provide support for offline and online charging. This includes support for charging correlation, e.g. between IM CN subsystem and PS domain. The charging architecture, charging principles and charging data for IM CN subsystem are described in 3GPP TS 32.200 [25] and 3GPP TS 32.225 [26]. The charging correlation information between IM CN subsystem and PS domain are also described in 3GPP TS 24.229 [10a] and 3GPP TS 29.207 [11a].

4.X Relationship to 3GPP Generic User Profile (GUP)

It shall be possible to apply the mechanisms and format of the 3GPP Generic User Profile (GUP) to IM CN Subsystem user related data. The 3GPP Generic User Profile (GUP) is described in 3GPP TS 23.240 [31].

5 IP multimedia subsystem procedures

End of second modified section

3GPP TSG-SA WG2 Meeting #31
Seoul, Korea, 7-11 April 2003

Tdoc ⌘S2-031557

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **287** ⌘ **rev** **2** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	Format of Public Service Identities
Source:	⌘	Siemens
Work item code:	⌘	IMS2
Date:	⌘	02/04/2003
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:	⌘	Public service identities have been introduced for release 6, however the format has not yet been defined.
Summary of change:	⌘	Sentence added that public service identities shall take the form of SIP URL .
Consequences if not approved:	⌘	Insufficient guidance for stage 3 work.

Clauses affected:	⌘	4.3.6

	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.

4.3.6 Public Service Identities

With the introduction of standardized presence, messaging, conferencing, and group service capabilities in IM CN subsystem, there is a need for Public Service Identities (PSIs). These identities are different from the Public User Identities in the respect that they identify services, which are hosted by application servers. For example, in chat-type services, there is a Public Service Identity (e.g sip:chatlist_X@example.com) to which the users establish a session to be able to send and receive messages from other session participants.

Public Service Identities shall take the form of SIP URL as defined in RFC 3261 [12] and RFC 2396 [13] or the "tel:"-URL format as defined in RFC 2806 [15].

The IM CN subsystem shall provide the capability for users to create, manage, and use Public Service Identities under control of AS. It shall be possible to create statically and dynamically a Public Service Identity.

Public Service Identities are associated with a service. The application server hosts the Public Service Identity and executes the specific service identified by the Public Service Identity.

The IM CN Subsystem shall provide capability of routing IMS messages using Public Service Identity.

3GPP TSG-SA WG2 Meeting #31 **Tdoc S2-031553**
Seoul, Korea, 7th-11th April 2003

CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **296** ⌘ **rev** **3** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	SLF on Sh interface
Source:	⌘	Nokia
Work item code:	⌘	IMS2
Date:	⌘	08/04/2003
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:	⌘	There does not exist a solution for user identity-HSS resolution on Sh interface.
Summary of change:	⌘	A new Dh interface is proposed to be added between AS and SLF to resolve the public user identity – HSS name mapping.
Consequences if not approved:	⌘	There is no standard mechanism to resolve the HSS name on the Sh interface.

Clauses affected:	⌘	5.8.1, 5.8.4

	Y	N			
Other specs affected: ⌘	X		Other core specifications	⌘	TS 23.002
		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.

5.8.1 User identity to HSS resolution

This section describes the resolution mechanism, which enables the I-CSCF, ~~and~~ the S-CSCF and the AS to find the address of the HSS, that holds the subscriber data for a given user identity when multiple and separately addressable HSSs have been deployed by the network operator. This resolution mechanism is not required in networks that utilise a single HSS e.g. optionally, it could be switched off on the I-CSCF and on the S-CSCF and/or on the AS using O&M mechanisms. An example for a single HSS solution is a server farm architecture. By default, the resolution mechanism shall be supported.

On REGISTER and on MT INVITEs, the I-CSCF queries the HSS for user's subscription specific data, e. g. the actual location or authentication parameters. This also has to be accomplished by the S-CSCF on REGISTER. In the case when more than one independently addressable HSS is utilized by a network operator, the HSS where user information for a given subscriber is available has to be found. To get the HSS name the I-CSCF and the S-CSCF query the Subscription Locator Functional (SLF) entity.

The subscription locator is accessed via the Dx interface or via the Dh interface. The Dx interface is the standard interface between the CSCF and the SLF and the Dh interface is the standard interface between the AS and the SLF. The synchronisation between the SLF and the different HSSs is an O&M issue.

A way to use the subscription locator is described in the following.

The Dx interface provides:

- an operation to query the subscription locator from the I-CSCF or from the S-CSCF, respectively
- a response to provide the HSS name towards the I-CSCF or towards the S-CSCF, respectively.

By sending the Dx-operation DX_SLF_QUERY the I-CSCF or the S-CSCF indicates a user identity of which it is looking for an HSS. By the Dx-operation DX_SLF_RESP the SLF responds with the HSS name. The I-CSCF or the S-CSCF, respectively, continues by querying the selected HSS. As an option at the registration flow, the I-CSCF may forward the HSS name towards the serving CSCF to simplify the procedure by which the serving CSCF finds the subscriber's HSS. This option can be used in a single HSS environment.

The ~~following two sections~~ subclause 5.8.2 presents the session flows on REGISTER and the subclause 5.8.3 on INVITE messages.

The Dh interface provides:

- an operation to query the subscription locator from the AS
- a response to provide the HSS name towards the AS.

By sending the Dh-operation DH_SLF_QUERY the AS indicates a public user identity of which it is looking for an HSS. By the Dh-operation DH_SLF_RESP the SLF responds with the HSS name. The AS continues by querying the selected HSS. The AS may store the HSS name for the subsequent Sh-operations.

The subclause 5.8.4 presents the message flow on Dh interface.

5.8.2 SLF on register

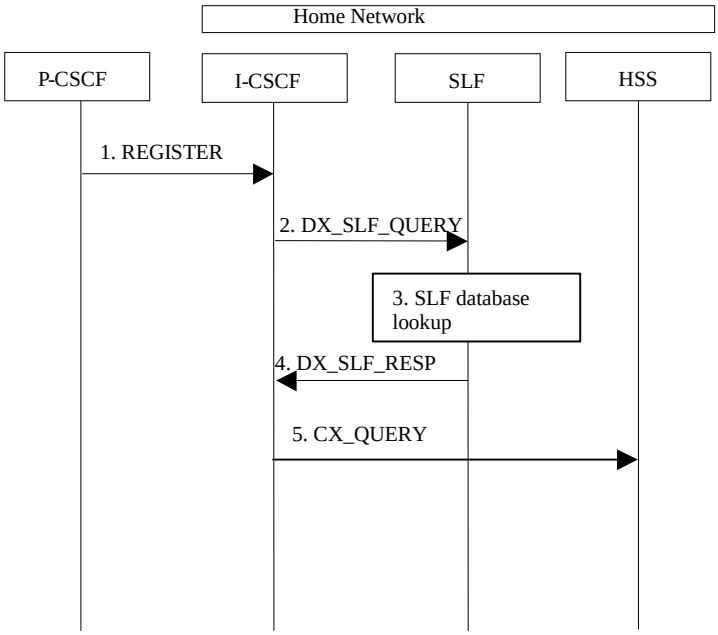

Figure 5.20: SLF on register (1st case)

1. I-CSCF receives a REGISTER request and now has to query for the location of the user's subscription data.
2. The I-CSCF sends a DX_SLF_QUERY to the SLF and includes as parameter the user identity which is stated in the REGISTER request.
3. The SLF looks up its database for the queried user identity.
4. The SLF answers with the HSS name in which the user's subscription data can be found.
5. The I-CSCF can proceed by querying the appropriate HSS.

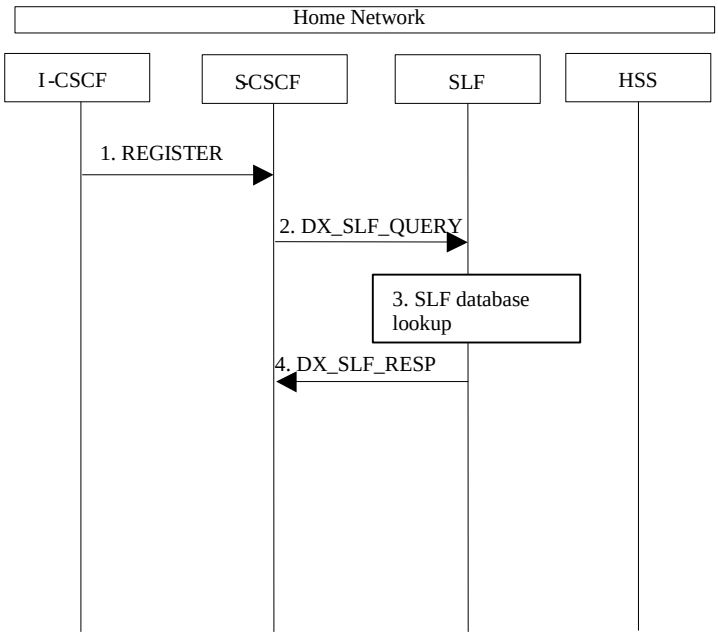

Figure 5.20a: SLF on register (2nd case)

1. I-CSCF sends a REGISTER request to the S-CSCF. This now has to query for the location of the user's subscription data.

2. The S-CSCF sends a DX_SLF_QUERY to the SLF and includes as parameter the user identity which is stated in the REGISTER request.

3. The SLF looks up its database for the queried user identity.

4. The SLF answers with the HSS name in which the user's subscription data can be found.

5.8.3 SLF on UE invite

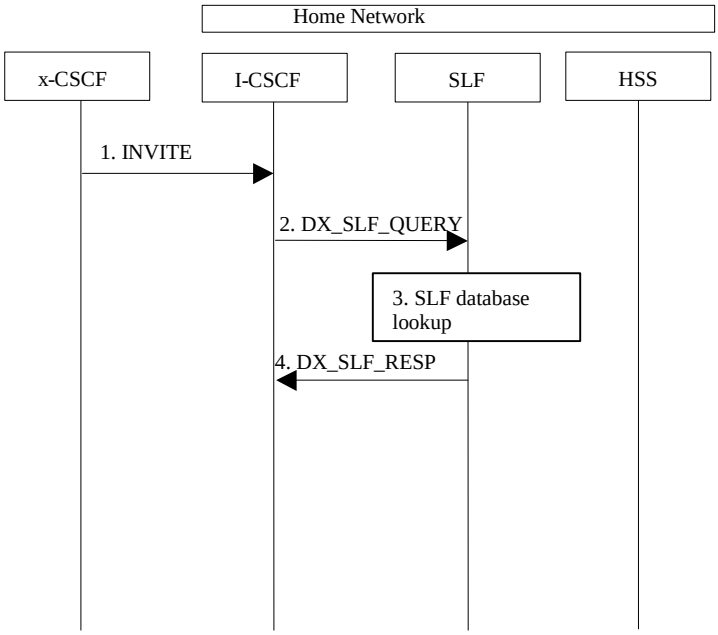

Figure 5.21: SLF on UE invite

1. I-CSCF receives an INVITE request and now has to query for the location of the user´s subscription data.

2. The I-CSCF sends a DX_SLF_QUERY to the HSS and includes as parameter the user identity which is stated in the INVITE request.

3. The SLF looks up its database for the queried user identity.

4. The SLF answers with the HSS name in which the user's subscription data can be found.

~~The synchronisation between the SLF and the different HSSs is an O&M issue.~~

To prevent an SLF service failure e.g. in the event of a server outage, the SLF could be distributed over multiple servers. Several approaches could be employed to discover these servers. An example is the use of the DNS mechanism in combination with a new DNS SRV record. The specific algorithm for this however does not affect the basic SLF concept and is outside the scope of this document.

5.8.4 SLF on Dh interface

The flow shown below is where the AS queries the SLF to identify the HSS to access.

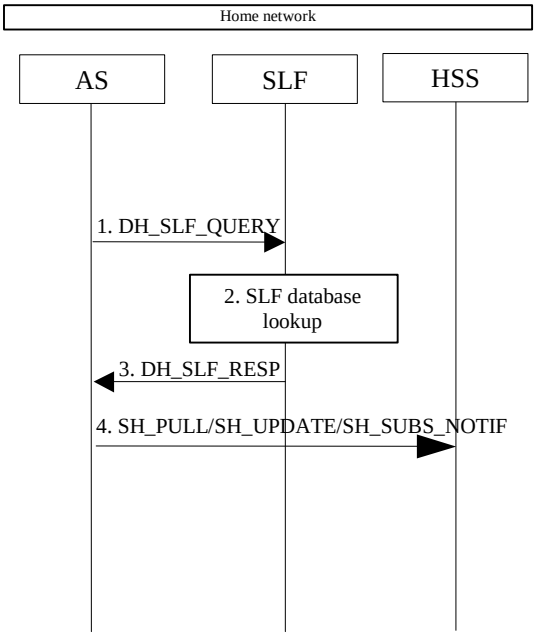

Figure 5.21: SLF on Sh interface

1. An AS sends a DH_SLF_QUERY to the SLF and includes as a parameter the public user identity.
2. The SLF looks up its database for the queried public user identity.
3. The SLF answers with the HSS name in which the user's subscription data can be found.
4. The AS sends the Sh message towards the correct HSS.

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CR-Form-v7

CHANGE REQUEST

⌘ **23.228** **CR** **284** ⌘ **rev** **2** ⌘ Current version: **6.1.0** ⌘

*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:	⌘	Refreshing sessions
Source:	⌘	Nokia
Work item code:	⌘	IMS2
Date:	⌘	09/04/2003
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:	⌘	TS 23.228 and TS 23.207 define mechanisms to tear down IMS sessions upon abrupt loss of the radio connection. These mechanisms utilize the Go interface. Some particular IMS services using session-based communication mechanisms might not use the Go interface. E.g. messaging sessions do not use bearers that are expected to be authorized by SBLP mechanisms. Hence, there is a need to have an application (i.e. SIP) level mechanism to cater for tearing down such sessions upon e.g. loss of radio coverage.
Summary of change:	⌘	A new section is introduced to form the architectural requirements for a SIP-level mechanism to refresh active sessions.
Consequences if not approved:	⌘	

Clauses affected:	⌘	New clause 5.x

		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.

********** First and only set of changes **********

5.X Refreshing sessions

The active sessions in stateful elements (e.g. CSCFs, ASs) need to be refreshed periodically. This allows these stateful elements to detect and free resources used up by hanging sessions.

This SIP-level refreshing mechanism is to be used to allow removing session state from the stateful elements of the session path upon unexpected error situations (e.g. loss of radio coverage, crash of application in the UE, etc…). The mechanism is intended as a complementary mechanism for the "Network initiated session release" described in sub-clause 5.10.3.

Note-i: Based on the nature of the refreshing mechanism described above, the expected refreshing period is in the several minute range.

Note-ii: It is FFS how the refreshing mechanism is initiated and whether this refreshing mechanism is on a per-UE or on a per-session basis.