3GPP TSG-CN Meeting #25 **NP-040384**
8th – 10th September 2004. Palm Springs, USA.

Source: **TSG CN WG1**

Title: **CR on Rel-6 WI IMS2 towards TS 23.218**

Agenda item: **9.21**

Document for: **APPROVAL**

This document contains **2 CRs on Rel-6 Work Item "IMS2"**, that have been agreed by TSG CN WG1 CN#35 meeting and forwarded to TSG CN Plenary meeting #25 for approval.

TDoc #	Tdoc Title	Spec	CR #	Rev	CAT	Current version	WI	Rel
N1-041440	IFC process termination at R-URI change	23.218	69		F	6.1.0	IMS2	Rel-6
N1-041562	Third party registration optimization	23.218	70	1	F	6.1.0	IMS2	Rel-6

3GPP TSG-CN1 Meeting #35 **Tdoc N1-041440**
Sophia Antipolis, France, 16-20 August 2004

CR-Form-v7.1

CHANGE REQUEST

⌘ **23.218** **CR** **069** ⌘ **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 ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	IFC process termination at R-URI change
Source:	⌘	Nokia
Work item code:	⌘	IMS2
Date:	⌘	07/08/2004
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:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Missing statement in case of unregistered user to terminate IFC process at R-URI change
Summary of change:	⌘	Requirement added
Consequences if not approved:	⌘	Possible confusion

Clauses affected:	⌘	6.5.2

		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:
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.

6.5.2 Handling of mobile terminating requests, unregistered user

The S-CSCF shall verify if the public user identity is barred. If so, it shall respond with a 4xx error code and stop further session processing.

The S-CSCF only looks for initial filter criteria when receiving an initial request. A terminating initial request may also originate from an Application Server via the ISC interface. Terminating Initial requests from an Application Server via the ISC interface also cause the S-CSCF to look for initial filter criteria.

When such a request comes in, the S-CSCF shall first check this is an originating request or a terminating request. This clause describes the requirements for the S-CSCF when this request is a terminating request. So, if this request is a terminating request, the S-CSCF shall:

- if unavailable, download the relevant subscriber profile including the initial filter criteria from the HSS;
- use the initial Filter Criteria for the Mobile Terminating request to unregistered user;
- in case the Request-URI changes when visiting an AS, terminate the checking of filter criterias, route the request based on the changed value of the Request-URI and do not execute the subsequent steps;
- the subsequent requirements for the S-CSCF are the same as those for handling originating requests.

It may be possible that originating UE and terminating UE shares the same S-CSCF and AS, therefore the shared application server may interact with the S-CSCF twice in one transaction but in originating and terminating procedures respectively.

3GPP TSG-CN1 Meeting #35 **Tdoc N1-041562**
Sophia Antipolis, France, 16-20 August 2004

CR-Form-v7.1

CHANGE REQUEST

⌘ **23.218** **CR** **070** ⌘**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:	⌘	Third party registration optimisation
Source:	⌘	Nokia
Work item code:	⌘	IMS2
Date:	⌘	17/08/2004
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)*
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Use one of the following releases:

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R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	New method proposed to differentiate REGISTER requests in IFC
Summary of change:	⌘	Enhancement of the Filter Criteria to minimise the number of third party registration messages generated by the S-CSCF
Consequences if not approved:	⌘	Misalignment with TS 23.228 and potential for increased load on S-CSCF and AS.
Clauses affected:	⌘	5.2, 6.3, 6.5.1, 6.5.2, 9.4.3

	Y	N			
Other specs affected: ⌘	X		Other core specifications	⌘	29.228 CR 121, 29.229 CR 059
		X	Test specifications		
		X	O&M Specifications		

Other comments: ⌘

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5.2 Service interaction with IP multimedia subsystem

Service Point Triggers (SPTs) are those points in the SIP signalling on which Filter Criteria can be set. The following SPTs are defined:

- any initial known or unknown SIP method (e.g. REGISTER, INVITE, SUBSCRIBE, MESSAGE);
- registration type – indicates if the REGISTER request is initial registration, re-registration, or de-registration;
- presence or absence of any known or unknown header field;
- content of any known or unknown header field or Request-URI;
- direction of the request ~~is~~ with respect to the served user – either mobile originated (MO), ~~or~~ mobile terminated (MT) to registered user; or mobile terminated to unregistered user; see 3GPP TS 29.228 [8] for the details of the direction information in service point trigger;

NOTE 1: REGISTER is considered part of the Mobile Origination. See 3GPP TS 24.229[5] for further information about how to determine MO or MT.

NOTE 2: The S-CSCF shall verify if the end user is barred before checking if any trigger applies for that end user.

- session description information.

A Filter Criteria triggers one or more SPTs in order to send the related request to one specific application server. The set of Filter Criteria that is stored for a service profile of a specific user is called "Application Server Subscription Information". In order to allow the S-CSCF to handle the different Filter Criteria in the right sequence, a priority shall be assigned to each of them. If the S-CSCF can not reach the Application Server, the S-CSCF shall apply the default handling associated with the trigger. This default handling shall be :

- to continue verifying if the triggers of lower priority in the list match; or
- to abandon verification of matching of the triggers of lower priority in the list; and to release the dialogue.

Therefore a Filter Criteria shall contain the following information:

- address of the Application Server to be contacted;
- priority of the Filter Criteria providing the sequence in which the criteria shall be applied;
- Trigger Point composed by 1 to n instances of the Service Point Triggers (SPTs). The SPTs may be linked by means of logical expressions (AND, OR, NOT, etc.);
- default handling (as described above);
- optional Service Information that shall be added to the message body before it is sent to the Application Server (as an example this may include the IMSI for the IM-SSF).

The same priority shall not be assigned to more than one initial Filter Criteria for a given end user.

The S-CSCF shall request from the HSS the relevant set of iFCs that applies to the end user (i.e., registered, unregistered, or both). If the S-CSCF has a set of iFCs that is deemed valid (e.g., from a previous request), the S-CSCF need not request a new set.

In the case that multiple Filter Criteria are sent from the HSS to the S-CSCF, the S-CSCF shall check the filter criteria one by one according to their indicated priority when the S-CSCF receives a message via the Mw interface.

On reception of a REGISTER request, the S-CSCF shall send a third-party REGISTER request to each Application Server that matches the Filter Criteria sent from the HSS for the REGISTER event.

On reception of any other request the S-CSCF shall:

1. set up the list of filter criteria for that request according to their priority – the sequence of the filter criteria shall not be changed until the request finally leaves the S-CSCF via the Mw interface again;
2. parse the received request in order to find out the Service Point Triggers (SPTs) that are included in it;

3. check whether the trigger points of the filter criteria with the next highest priority are matched by the SPTs of the request and

   a) if it does not match the S-CSCF shall immediately proceed with step 4;

   b) if it matches the S-CSCF shall:

      i) add an indication to the request which will allow the S-CSCF to identify the message on the incoming side, even if its dialog identification has been changed e.g. due to the Application Server performing third party call control;

      ii) forward the request via the ISC interface to the Application Server indicated in the current filter criteria. The Application Server then performs the service logic, may modify the request and may send the request back to the S-CSCF via the ISC interface;

      iii) proceed with step 4 if the request was received again from the Application Server via the ISC interface;

4. repeat the above steps 2 and 3 for every filter criteria which was initially set up (in step 1) until the last filter criteria has been checked;

5. route the request based on normal SIP routing behaviour.

If an Application Server decides to locally terminate a request and sends back a final response for that request via the ISC interface to the S-CSCF, the S-CSCF shall abandon verification of the matching of the triggers of lower priority in the list. The final response shall include the indicator defined in step 3 b) i) above, so that the S-CSCF can correlate the messages.

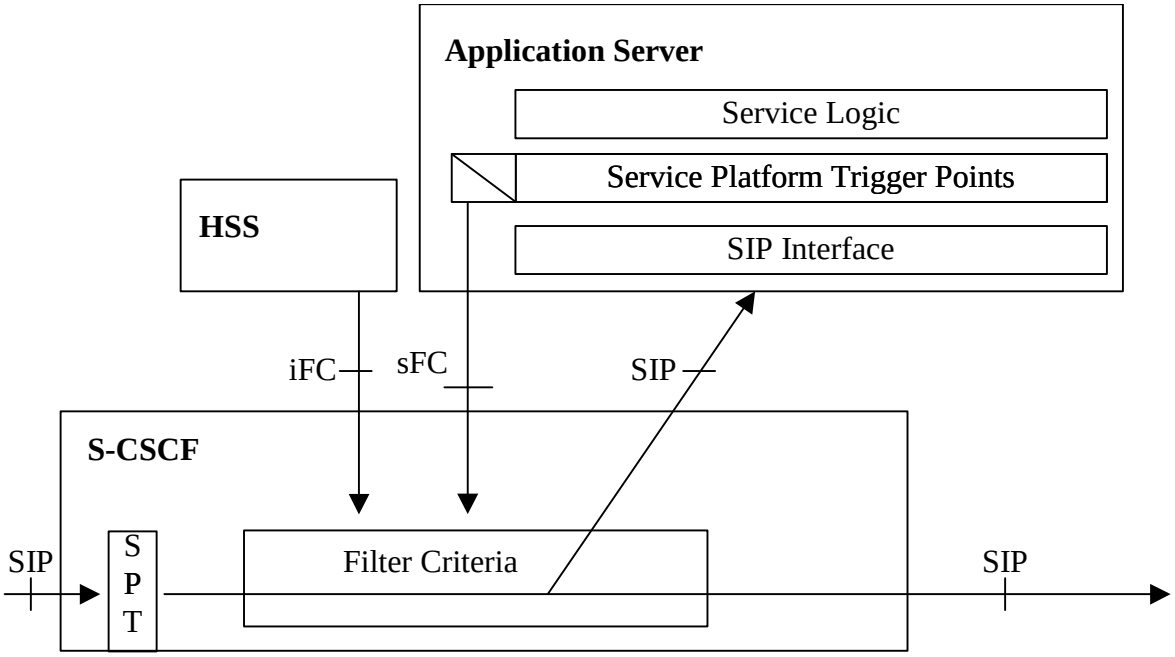

Figure 5.2.1: Application triggering architecture

Each invoked Application Server/service logic may decide not to be engaged with the invoked session by indicating that during the very first SIP transaction when the Record-Route/Route is generated for subsequent SIP requests. The denial shall mean that subsequent requests shall not be routed to such Application Servers/service logic any more during the lifetime of that session. Any Application Server, which has determined that it will not receive subsequent requests for a session cannot revoke this determination by means of Initial Filter Criteria (iFC).

NOTE: Care should be taken in design of the Initial Filter Criteria when designing services to avoid unintended loops being setup, where requests from an Application Server may be sent back to the same Application Server. This does not imply that it is not allowed for requests to be sent back to the same Application Server when that is intended behaviour as part of the design of the service and the Application Server is able to handle this correctly. Special care should be taken for the case when an Application Server may act as an originating UA or B2BUA and may originate an initial request causing evaluation of Initial Filter Criteria.

---------- next change ----------

6.3 Handling of SIP registration

Upon receiving the initial registration request from the user, the S-CSCF shall authenticate the user and upon receiving a subsequent registration request containing valid authentication credentials, request the HSS to send the relevant service profile(s) for the user's subscription. More than one service profile may be sent, depending on configuration options for identifying implicitly registered public user identities. For further detailed information on registration, profile download and authentication procedures see 3GPP TS 24.229 [5] and 3GPP TS 33.203 [11].

The initial filter criteria (subset of the profile) is stored locally at the S-CSCF, as specified in 3GPP TS 24.229 [5].

The S-CSCF shall verify if the triggers match, from the highest to the lowest priority (see subclause 5.2).

After a successfully authenticated registration, the S-CSCF shall download from the HSS all the implicitly registered public user identities associated with the registered public user identity. The S-CSCF shall then verify, in their order of priority, if the triggers downloaded from the HSS match. If the registration request from the user matches a trigger, the S-CSCF performs a third party registration to the application servers which are interested to be informed about the user registration event of these public user identities. This may trigger services to be executed by an Application Server.

The important information carried in the third party REGISTER request is the public user identity, the S-CSCF address and the expiration time. It shall be possible based on operator configuration to use one of the implicitly registered public user identities as the public user identity in the To header of the third party REGISTER request sent to the Application Server. Additional application server specific data, which is associated with the Filter Criteria and obtained from the HSS, is added to the REGISTER request body. This data should include the IMSI for an Application Server that supports CAMEL services or the private user identity for other Application Servers as received from the HSS.

This third party registration will include an expiration time that is equal to the expiration time sent to the UE by the S-CSCF in the 200 OK response to the incoming REGISTER request

On receiving a failure response to one of the REGISTER requests, the S-CSCF shall apply the "default handling" related with the initial Filter Criteria's trigger used (see subclauses 5.2, 6.9.2.2).

See figure 6.3.1:

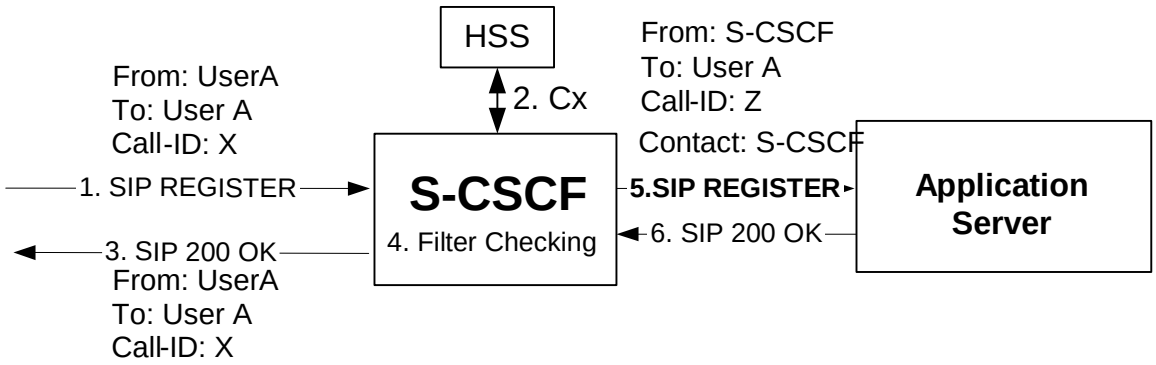

Figure 6.3.1: S-CSCF handling registration

Application Servers can in addition subscribe to the S-CSCF Registration Event Package. This provides a mechanism for the Application Server to discover all the implicitly registered public user identities without requiring multiple Register requests to be sent to the Application Server and to obtain the current capabilities of the UE~~user's mobile~~ as well as be notified about refresh registrations and de-registrations. The S-CSCF will send NOTIFY requests to the Application Server that has subscribed to the registration event package for the registered public user identity.

NOTE: -When the Application Server maintains a persistent subscription to the reg-event ~~Registration Event P~~package~~-~~ it is not necessary for the Application Server to receive third party registration requests from the S-CSCF in response to refresh and de-registration events as these are communicated to the Application Server in the Registration event notifications.~~ It is therefore recommended in this case that Filter Criteria is used to only trigger a third party registration in response to an initial registration (see subclause 5.2).~~

More information on these procedures is contained in 3GPP TS 24.229 [5].

---------- next change ----------

6.5.1 Handling of mobile terminating requests, registered user

The S-CSCF shall verify if the public user identity is barred. If so, it shall respond with a 4xx error code and stop further session processing.

The S-CSCF only looks for initial filter criteria when receiving an initial request. A terminating initial request may also originate from an Application Server via the ISC interface. Terminating Initial requests from an Application Server via the ISC interface also cause the S-CSCF to look for initial filter criteria.

When such a request comes in, the S-CSCF shall first check whether this is an originating request or a terminating request. For terminating initial requests the S-CSCF shall first perform any routing of the request to Application Server based on matching of initial Filter Criteria before performing other routing procedures towards the terminating UE, (e.g. forking, caller preferences etc). This clause describes the requirements for the S-CSCF when this request is a terminating request. So, if this request is a terminating request, the S-CSCF shall:

- if unavailable, download the relevant subscriber profile including the initial filter criteria from the HSS;
- use the initial Filter Criteria for the Mobile Terminating request to registered user;
- in case the Request-URI changes when visiting an Application Server, terminate the checking of filter criterias, route the request based on the changed value of the Request-URI and do not execute the subsequent steps;
- the subsequent requirements for the S-CSCF are the same as those for handling originating requests.

It may be possible that originating UE and terminating UE shares the same S-CSCF and Application Server, therefore the shared application server may interact with the S-CSCF twice in one transaction but in originating and terminating procedures respectively.

6.5.2 Handling of mobile terminating requests, unregistered user

The S-CSCF shall verify if the public user identity is barred. If so, it shall respond with a 4xx error code and stop further session processing.

The S-CSCF only looks for initial filter criteria when receiving an initial request. A terminating initial request may also originate from an Application Server via the ISC interface. Terminating Initial requests from an Application Server via the ISC interface also cause the S-CSCF to look for initial filter criteria.

When such a request comes in, the S-CSCF shall first check this is an originating request or a terminating request. This clause describes the requirements for the S-CSCF when this request is a terminating request. So, if this request is a terminating request, the S-CSCF shall:

- if unavailable, download the relevant subscriber profile including the initial filter criteria from the HSS;
- use the initial Filter Criteria for the Mobile Terminating request to unregistered user;
- the subsequent requirements for the S-CSCF are the same as those for handling originating requests.

It may be possible that originating UE and terminating UE shares the same S-CSCF and Application Server, therefore the shared application server may interact with the S-CSCF twice in one transaction but in originating and terminating procedures respectively.

---------- next change ----------

9.4.3 Application Server handling of SIP registration

When the user is registered with the network and has been assigned a S-CSCF, the application servers, which are interested to know about the user registration events, should get a third party registration request generated by the S-CSCF. When the application server receives the request, the Application Server may perform a service triggered by a REGISTER. If the application server doesn't support this mechanism, it shall send back an error response to the S-CSCF. If the application server supports this mechanism, it shall treat this request as a notification from the network about the user's registration event and extract the important information from this request.

The application server may, depending on the Filter Criteria~~will also expect to~~ receive REGISTER requests indicating reregistration or deregistration events from the S-CSCF, so that the application server can update or release user's registration information.

The important information carried in the third party registration request are, the public user identity, the S-CSCF address, and the expiration time.

The application server can also extract user specific data from the REGISTER request, e.g. the IMSI for an Application Server that supports CAMEL services.

Application Servers can also subscribe to the S-CSCF Registration Event Package after receiving the third party registration request. After subscribing to the event package with the S-CSCF, the application will expect to receive the notifications from the S-CSCF, which may carry the user's implicitly registered public user identities, the user's terminal current capabilities and the user's registration event information.

The application server can also obtain the user's implicitly registered public identities by accessing the HSS via Sh or Si interface.

An application server will require knowledge of a user's IMS subscription information if they are to correctly apply services. This information can be provided to the application server in two ways, either:

a) Manually by provisioning. This is outside of the scope of this specification.

b) Automatically from the HSS via the Sh and Si interfaces.

More information on these procedures is contained in 3GPP TS 24.229 [5].