Source: TSG CN WG4

Title: Corrections on IMS Cx-interface

Agenda item: 8.1

Document for: APPROVAL

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
29.228	088		N4-040112	Rel-5	Correction to User-Authorization-Answer	F	5.6.0
29.228	089		N4-040113	Rel-6	Correction to User-Authorization-Answer	A	6.1.0
29.228	076	1	N4-040270	Rel-5	Clarification on S-CSCF-Name comparison	F	5.6.0
29.228	077	1	N4-040271	Rel-6	Clarification on S-CSCF-Name comparison	A	6.1.0
29.228	090		N4-040272	Rel-5	Default handling of error cases during IMS registration	F	5.6.0
29.228	091		N4-040273	Rel-6	Default handling of error cases during IMS registration	A	6.1.0
29.228	084	1	N4-040281	Rel-5	Conditions for inclusion of Public Identity in SAR	F	5.6.0
29.228	085	1	N4-040282	Rel-6	Conditions for inclusion of Public Identity in SAR	A	6.1.0
29.228	086	1	N4-040342	Rel-5	Correction to sending the Charging-Information AVP	F	5.6.0
29.228	087	1	N4-040343	Rel-6	Correction to sending the Charging-Information AVP	A	6.1.0

<div style="text-align:right">*CR-Form-v7*</div>

CHANGE REQUEST

⌘	**29.228** CR **088**	⌘**rev**	**-**	⌘	Current version:	**5.6.0** ⌘

*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: ⌘	Correction to User-Authorization-Answer	
Source: ⌘	CN4	
Work item code: ⌘	IMS-CCR	***Date:*** ⌘ 20/01/2004
Category: ⌘	**F**	***Release:*** ⌘ Rel-5

Use <u>one</u> 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 <u>one</u> 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: ⌘	When a user does not have a S-CSCF assigned and the selection of S-CSCF is required in user registration status query (UAR/UAA) or in user location query (LIR/LIA), the HSS shall return a list of S-CSCF capabilities, which enables the I-CSCF to select appropriate S-CSCF to satisfy the most restrictive service profile of the user. If the I-CSCF is allowed to select any S-CSCF for a user, the HSS shall not return S-CSCF capabilities at all. The absence of the S-CSCF capabilities is specified in the user location query explicitly: "If Server-Capabilities AVP is not present, the I-CSCF shall understand that any S-CSCF is suitable to serve the user." However in the user registration status query the absence of the S-CSCF capabilities is not specified unambigiously: "The list of S-CSCF capabilities may be empty, to indicate to the I-CSCF that it may select any available S-CSCF.", and that can cause different implementations. This is an essential correction.
Summary of change: ⌘	It is proposed to align the text in the user registration status query with the text in the user location query and replace the term "list of S-CSCF capabilities" with "Server-Capabilities AVP".
Consequences if not approved: ⌘	The current specification may lead to two different interpretation what is "the empty list of S-CSCF capabilities" and cause the failure of the IMS registration.
Clauses affected: ⌘	6.1.1.1

		Y	**N**		
Other specs ⌘			**X**	Other core specifications	⌘
affected:			**X**	Test specifications	

		X	O&M Specifications	

Other comments:	⌘	The N4-040113 contains the rel-6 mirror CR.

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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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.

6.1.1.1 Detailed behaviour

The HSS shall, in the following order (if there is an error in any of the following steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.229 [5]):

1. Check that the user exists in the HSS. If not Experimental-Result-Code shall be set to DIAMETER_ERROR_USER_UNKNOWN.

2. Check that the private and public identities received in the request belong to the same user. If not Experimental-Result-Code shall be set to DIAMETER_ERROR _IDENTITIES_DONT_MATCH.

3. Check whether the public identity received in the request is barred for the establishment of multimedia sessions.

   - If it is, the HSS shall check whether there are other non-barred public identities to be implicitly registered with that one.

     - If so, continue to step 4.

     - If not, Result-Code shall be set to DIAMETER_AUTHORIZATION_REJECTED.

4. Check the User-Authorization-Type received in the request:

   - If it is REGISTRATION or if User-Authorization-Type is absent from the request, the HSS shall check that the user is allowed to roam in the visited network (if not Experimental-Result-Code shall be set to DIAMETER_ERROR _ROAMING_NOT_ALLOWED) and authorized to register (if not Result-Code shall be set to DIAMETER_AUTHORIZATION_REJECTED). Continue to step 5.

   - If it is DE_REGISTRATION, the HSS may not perform any check regarding roaming. Continue to step 5.

   - If it is REGISTRATION_AND_CAPABILITIES, the HSS shall check that the user is allowed to roam in the visited network (if not Experimental-Result-Code shall be set to DIAMETER_ERROR _ROAMING_NOT_ALLOWED) and authorized to register (if not Result-Code shall be set to DIAMETER_AUTHORIZATION_REJECTED). The HSS shall return the ~~list of S-CSCF capabilities~~Server-Capabilities AVP, which enables the I-CSCF to select an S-CSCF. The returned capabilities must satisfy the most restrictive service profile of the user. The Server-Capabilities AVP may be absent~~The list of capabilities may be empty~~, to indicate to the I-CSCF that it can select any available S-CSCF. Result-Code shall be set to DIAMETER_SUCCESS. The HSS shall not return any S-CSCF name. Stop processing.

5. Check the state of the public identity received in the request:

   - If it is registered, the HSS shall return the stored S-CSCF name. No S-CSCF capabilities shall be present in the response. If User-Authorization-Type is equal to REGISTRATION, Experimental-Result-Code shall be set to DIAMETER_SUBSEQUENT_REGISTRATION. If User-Authorization-Type is equal to DE-REGISTRATION, Result-Code shall be set to DIAMETER_SUCCESS.

   - If it is unregistered (i.e registered as a consequence of a terminating call or there is a S-CSCF keeping the user profile stored) and User-Authorization-Type is equal to DE-REGISTRATION, Result-Code shall be set to DIAMETER_SUCCESS. If the User-Authorization-Type is equal to REGISTRATION, then:

     - If the selection of a new S-CSCF is not necessary, the HSS shall return the stored S-CSCF name and the Experimental-Result-Code set to DIAMETER_SUBSEQUENT_REGISTRATION. The HSS shall not return any S-CSCF capabilities.

     - Otherwise, the HSS shall return the name of the S-CSCF assigned to the unregistered user, the S-CSCF capabilities and the Experimental-Result-Code set to DIAMETER_SERVER_SELECTION. Considering the information received from the HSS, the I-CSCF shall determine whether or not it has to select a new S-CSCF.

   - If it is not registered yet, the HSS shall check the value of User-Authorization-Type received in the request:

     - If the value of User-Authorization-Type is DE_REGISTRATION, then the HSS shall not return any S-CSCF name or S-CSCF capabilities. The HSS shall set the Experimental-Result-Code to DIAMETER_ERROR_IDENTITY_NOT_REGISTERED in the response.

- If the value of User-Authorization-Type is REGISTRATION, then the HSS shall check if there is at least one identity of the user with an S-CSCF name assigned.

    - If there is at least one identity of the user that is registered the HSS shall return the S-CSCF name assigned for the user and Experimental-Result-Code set to DIAMETER_SUBSEQUENT_REGISTRATION. The HSS shall not return any S-CSCF capabilities.

    - If there is at least one identity of the user that is unregistered (i.e registered as a consequence of a terminating call or there is an S-CSCF keeping the user profile stored), then:

        - If the selection of a new S-CSCF is not necessary, the HSS shall return the stored S-CSCF name and the Experimental-Result-Code set to DIAMETER_SUBSEQUENT_REGISTRATION. The HSS shall not return any S-CSCF capabilities.

        - Otherwise, the HSS shall return the name of the S-CSCF assigned to the unregistered user, the S-CSCF capabilities and the Experimental-Result-Code set to DIAMETER_SERVER_SELECTION. Considering the information received from the HSS, the I-CSCF shall determine whether or not it has to select a new S-CSCF.

    - If there is not any identity of the user with an S-CSCF name assigned, then the HSS shall return the ~~list of S-CSCF capabilities~~Server-Capabilities AVP, which enables the I-CSCF to select an S-CSCF. The returned capabilities shall satisfy the most restrictive service profile of the user. ~~The list of S-CSCF capabilities may be empty~~The Server-Capabilities AVP may be absent, to indicate to the I-CSCF that it may select any available S-CSCF. Experimental-Result-Code shall be set to DIAMETER_FIRST_REGISTRATION. The HSS shall not return any S-CSCF name.

If the HSS cannot fulfil received request, e.g. due to database error, it shall set Result-Code to DIAMETER_UNABLE_TO_COMPLY. No S-CSCF name or S-CSCF capabilities shall be present in the response.

CR-Form-v7

CHANGE REQUEST

⌘ **29.228 CR 089** ⌘**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 **X**

Title: ⌘	Correction to User-Authorization-Answer	
Source: ⌘	CN4	
Work item code:⌘	IMS-CCR	***Date:*** ⌘ 20/01/2004
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)
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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: ⌘	When a user does not have a S-CSCF assigned and the selection of S-CSCF is required in user registration status query (UAR/UAA) or in user location query (LIR/LIA), the HSS shall return a list of S-CSCF capabilities, which enables the I-CSCF to select appropriate S-CSCF to satisfy the most restrictive service profile of the user. If the I-CSCF is allowed to select any S-CSCF for a user, the HSS shall not return S-CSCF capabilities at all. The absence of the S-CSCF capabilities is specified in the user location query explicitly: "If Server-Capabilities AVP is not present, the I-CSCF shall understand that any S-CSCF is suitable to serve the user." However in the user registration status query the absence of the S-CSCF capabilities is not specified unambigiously: "The list of S-CSCF capabilities may be empty, to indicate to the I-CSCF that it may select any available S-CSCF.", and that can cause different implementations. This is an essential correction.
Summary of change:⌘	It is proposed to align the text in the user registration status query with the text in the user location query and replace the term "list of S-CSCF capabilities" with "Server-Capabilities AVP".
Consequences if ***not approved:*** ⌘	The current specification may lead to two different interpretation what is "the empty list of S-CSCF capabilities".
Clauses affected: ⌘	6.1.1.1

		Y	N		
Other specs ⌘			X	Other core specifications ⌘	
affected:			X	Test specifications	

			X	O&M Specifications		

Other comments: ⌘ The corresponding rel-5 CR is in N4-040112.

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6.1.1.1   Detailed behaviour

The HSS shall, in the following order (if there is an error in any of the following steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.229 [5]):

1. Check that the user exists in the HSS. If not Experimental-Result-Code shall be set to DIAMETER_ERROR_USER_UNKNOWN.

2. Check that the private and public identities received in the request belong to the same user. If not Experimental-Result-Code shall be set to DIAMETER_ERROR _IDENTITIES_DONT_MATCH.

3. Check whether the public identity received in the request is barred for the establishment of multimedia sessions.

   - If it is, the HSS shall check whether there are other non-barred public identities to be implicitly registered with that one.

      - If so, continue to step 4.

      - If not, Result-Code shall be set to DIAMETER_AUTHORIZATION_REJECTED.

4. Check the User-Authorization-Type received in the request:

   - If it is REGISTRATION or if User-Authorization-Type is absent from the request, the HSS shall check that the user is allowed to roam in the visited network (if not Experimental-Result-Code shall be set to DIAMETER_ERROR _ROAMING_NOT_ALLOWED) and authorized to register (if not Result-Code shall be set to DIAMETER_AUTHORIZATION_REJECTED). Continue to step 5.

   - If it is DE_REGISTRATION, the HSS may not perform any check regarding roaming. Continue to step 5.

   - If it is REGISTRATION_AND_CAPABILITIES, the HSS shall check that the user is allowed to roam in the visited network (if not Experimental-Result-Code shall be set to DIAMETER_ERROR _ROAMING_NOT_ALLOWED) and authorized to register (if not Result-Code shall be set to DIAMETER_AUTHORIZATION_REJECTED). The HSS shall return the Server-Capabilities AVPlist of S-CSCF capabilities, which enables the I-CSCF to select an S-CSCF. The returned capabilities must satisfy the most restrictive service profile of the user. The Server-Capabilities AVP may be absentThe list of capabilities may be empty, to indicate to the I-CSCF that it can select any available S-CSCF. Result-Code shall be set to DIAMETER_SUCCESS. The HSS shall not return any S-CSCF name. Stop processing.

5. Check the state of the public identity received in the request:

   - If it is registered, the HSS shall return the stored S-CSCF name. No S-CSCF capabilities shall be present in the response. If User-Authorization-Type is equal to REGISTRATION, Experimental-Result-Code shall be set to DIAMETER_SUBSEQUENT_REGISTRATION. If User-Authorization-Type is equal to DE-REGISTRATION, Result-Code shall be set to DIAMETER_SUCCESS.

   - If it is unregistered (i.e registered as a consequence of a terminating call or there is a S-CSCF keeping the user profile stored) and User-Authorization-Type is equal to DE-REGISTRATION, Result-Code shall be set to DIAMETER_SUCCESS. If the User-Authorization-Type is equal to REGISTRATION, then:

      - If the selection of a new S-CSCF is not necessary, the HSS shall return the stored S-CSCF name and the Experimental-Result-Code set to DIAMETER_SUBSEQUENT_REGISTRATION. The HSS shall not return any S-CSCF capabilities.

      - Otherwise, the HSS shall return the name of the S-CSCF assigned to the unregistered user, the S-CSCF capabilities and the Experimental-Result-Code set to DIAMETER_SERVER_SELECTION. Considering the information received from the HSS, the I-CSCF shall determine whether or not it has to select a new S-CSCF.

   - If it is not registered yet, the HSS shall check the value of User-Authorization-Type received in the request:

      - If the value of User-Authorization-Type is DE_REGISTRATION, then the HSS shall not return any S-CSCF name or S-CSCF capabilities. The HSS shall set the Experimental-Result-Code to DIAMETER_ERROR_IDENTITY_NOT_REGISTERED in the response.

- If the value of User-Authorization-Type is REGISTRATION, then the HSS shall check if there is at least one identity of the user with an S-CSCF name assigned.

  - If there is at least one identity of the user that is registered the HSS shall return the S-CSCF name assigned for the user and Experimental-Result-Code set to DIAMETER_SUBSEQUENT_REGISTRATION. The HSS shall not return any S-CSCF capabilities.

  - If there is at least one identity of the user that is unregistered (i.e registered as a consequence of a terminating call or there is an S-CSCF keeping the user profile stored), then:

    - If the selection of a new S-CSCF is not necessary, the HSS shall return the stored S-CSCF name and the Experimental-Result-Code set to DIAMETER_SUBSEQUENT_REGISTRATION. The HSS shall not return any S-CSCF capabilities.

    - Otherwise, the HSS shall return the name of the S-CSCF assigned to the unregistered user, the S-CSCF capabilities and the Experimental-Result-Code set to DIAMETER_SERVER_SELECTION. Considering the information received from the HSS, the I-CSCF shall determine whether or not it has to select a new S-CSCF.

  - If there is not any identity of the user with an S-CSCF name assigned, then the HSS shall return the Server-Capabilities AVP~~list of S-CSCF capabilities~~, which enables the I-CSCF to select an S-CSCF. The returned capabilities shall satisfy the most restrictive service profile of the user. The Server-Capabilities AVP may be absent~~The list of S-CSCF capabilities may be empty~~, to indicate to the I-CSCF that it may select any available S-CSCF. Experimental-Result-Code shall be set to DIAMETER_FIRST_REGISTRATION. The HSS shall not return any S-CSCF name.

If the HSS cannot fulfil received request, e.g. due to database error, it shall set Result-Code to DIAMETER_UNABLE_TO_COMPLY. No S-CSCF name or S-CSCF capabilities shall be present in the response.

CR-Form-v7

CHANGE REQUEST

⌘   **29.228** CR **076**   ⌘**rev** **1** ⌘ Current version: **5.6.0** ⌘

*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: ⌘	Clarification on S-CSCF-Name comparison	
Source: ⌘	CN4	
Work item code: ⌘	IMS	***Date:*** ⌘ 18/02/2004

Category: ⌘ **F**	***Release:*** ⌘ Rel-5

Use <u>one</u> 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 <u>one</u> 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: ⌘	Essential Correction The current text does not specify the rules to determine equality of S-CSCF Names.
Summary of change: ⌘	Add a reference to RFC 3261 which specifies the rules to determine equality of SIP URIs
Consequences if not approved: ⌘	Incomplete and unclear specification may lead to different incompatible implementations which result in serious misoperation for IMS registration

Clauses affected: ⌘	6

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

Other comments: ⌘	

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6 Procedure Descriptions

In the tables that describe the information elements transported by each command, each Information Element is marked as (M) Mandatory, (C)~~C~~ Conditional or (O) Optional. A mandatory information element shall always be present. A conditional information shall be present if certain conditions are fulfilled; if those conditions are not fulfilled it shall be absent. An optional information element may be present or absent in the command, at the discretion of the application at the sending entity.

When a procedure is required to determine whether two S-CSCF names are equal, the rules for SIP URI comparison specified in RFC 3261 chapter 19.1.4 shall apply.

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** CR **077** ⌘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 **X**

Title: ⌘	Clarification on S-CSCF-Name comparison	
Source: ⌘	CN4	
Work item code:⌘	IMS	***Date:*** ⌘ 18/02/2004

Category: ⌘ **A**

    Release: ⌘ Rel-6

Use one of the following categories:
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Reason for change: ⌘	Essential Correction The current text does not specify the rules to determine equality of S-CSCF Names.
Summary of change:⌘	Add a reference to RFC 3261 which specifies the rules to determine equality of SIP URIs
Consequences if not approved: ⌘	Incomplete and unclear specification may lead to different incompatible implementations which result in serious misoperation for IMS registration

Clauses affected: ⌘	6	

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

Other comments: ⌘	

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In the tables that describe the information elements transported by each command, each Information Element is marked as (M) Mandatory, (C) Conditional or (O) Optional. A mandatory information element shall always be present. A conditional information shall be present if certain conditions are fulfilled; if those conditions are not fulfilled it shall be absent. An optional information element may be present or absent in the command, at the discretion of the application at the sending entity.

When a procedure is required to determine whether two S-CSCF names are equal, the rules for SIP URI comparison specified in RFC 3261 chapter 19.1.4 shall apply.

CR-Form-v7

CHANGE REQUEST

⌘	**29.228** CR **090**	⌘**rev**	**-**	⌘	Current version:	**5.6.0**	⌘

*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: ⌘	Default handling of error cases during IMS registration	
Source: ⌘	CN4	
Work item code:⌘	IMS-CCR	***Date:*** ⌘ 20/02/2004
Category: ⌘	**F**	***Release:*** ⌘ Rel-5

Use one of the following categories:
F (correction)
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R98   (Release 1998)
R99   (Release 1999)
Rel-4   (Release 4)
Rel-5   (Release 5)
Rel-6   (Release 6)

Reason for change: ⌘	The current specification of the S-CSCF registration/deregistration notification procedure does not describe all the possible error cases and the appropriate behaviour of the HSS when it is not able to handle the request for error cases not described.
Summary of change:⌘	A text describing the default handling of error cases is added. If the HSS is not able to proceed the received request for other reasons than thoses already described, it shall return the Result-Code 'DIAMETER_UNABLE_TO_COMPLY' to the S-CSCF and shall stop processing the request.
Consequences if not approved: ⌘	Incomplete specification leading to misoperations during IMS registration/deregistration procedures.

Clauses affected: ⌘	6.1.2.1

	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:
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.

6.1.2.1   Detailed behaviour

On registering/deregistering a public identity the S-CSCF shall inform the HSS. The same procedure is used by the S-CSCF to get the user profile. The relevant user profile downloaded is described in more detailed in the section 6.6. The HSS holds information about the state of registration of all the identities of the user. The S-CSCF uses this procedure to update such state. The HSS shall, in the following order (in case of an error in any of the steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.229 [5]):

1. Check that the user is known. If not Experimental-Result-Code shall be set to DIAMETER_ERROR_USER_UNKNOWN.

2. The HSS may check whether the private and public identities received in the request belong to the same user. If not Experimental-Result-Code shall be set to DIAMETER_ERROR_IDENTITIES_DONT_MATCH.

3. Check the Server Assignment Type value received in the request:

   - If it indicates REGISTRATION or RE_REGISTRATION, the HSS shall download the relevant user public identity information. If set, the flag that indicates that the identity is pending of the confirmation of the authentication shall be cleared. The Result-Code shall be set to DIAMETER_SUCCESS.

     Only one identity shall be present in the request. If more than one identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and no user information shall be returned.

   - If it indicates UNREGISTERED_USER, the HSS shall store the S-CSCF name, set the registration state of the public identity as unregistered, i.e. registered as a consequence of a terminating call and download the relevant user public identity information. The Result-Code shall be set to DIAMETER_SUCCESS.

     Only one identity shall be present in the request. If more than one identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and the modifications specified in the previous paragraph shall not be performed.

   - If it indicates TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION, DEREGISTRATION_TOO_MUCH_DATA or ADMINISTRATIVE_DEREGISTRATION, the HSS shall clear the S-CSCF name for all the public identities that the S-CSCF indicated in the request and set the registration state of the identities as not registered. If no public identity is present in the request, the private identity shall be present; the HSS shall clear the S-CSCF name for all the identities of the user and set their registration state to not registered. The Result-Code shall be set to DIAMETER_SUCCESS.

   - If it indicates TIMEOUT_DEREGISTRATION_STORE_SERVER_NAME or USER_DEREGISTRATION_STORE_SERVER_NAME the HSS decides whether to keep the S-CSCF name stored or not for all the public identities that the S-CSCF indicated in the request and set the registration state of the identities as unregistered. If no public identity is present in the request, the private identity shall be present. If the HSS decided to keep the S-CSCF name stored the HSS keeps the S-CSCF name stored for all the identities of the user and set their registration state to unregistered.

     If the HSS decides to keep the S-CSCF name the Result-Code shall be set to DIAMETER_SUCCESS.

     If the HSS decides not to keep the S-CSCF name the Experimental-Result-Code shall be set to DIAMETER_SUCCESS_SERVER_NAME_NOT_STORED.

   - If it indicates NO_ASSIGNMENT, the HSS checks whether the user is assigned for the S-CSCF requesting the data and download the user public identity information requested in the User-Data-Request-Type AVP. The Result-Code shall be set to DIAMETER_SUCCESS. If the requesting S-CSCF is not the same as the assigned S-CSCF, the Result-Code shall be set to DIAMETER_UNABLE_TO COMPLY.

     Only one public identity shall be present in the request. If more than one public identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and no user information shall be returned.

   - If it indicates AUTHENTICATION_FAILURE or AUTHENTICATION_TIMEOUT, the HSS shall clear the S-CSCF name for the public identity that the S-CSCF indicated in the request and set the registration state of

the identity as not registered. The flag that indicates that the identity is pending of the confirmation of the authentication shall be cleared. The Result-Code shall be set to DIAMETER_SUCCESS.

Only one identity shall be present in the request. If more than one identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and the modifications specified in the previous paragraph shall not be performed.

If the HSS cannot fulfil the received request, e.g. due to database error, it shall set the Result-Code to DIAMETER_UNABLE_TO_COMPLY. The HSS shall not modify any user state nor download any user public identity information to the S-CSCF.

See chapter 8.1.2 and 8.1.3 for the description of the handling of the error situations: reception of an S-CSCF name different from the one stored in the HSS and reception of a Server-Assignment-Type value not compatible with the registration state of the user.

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** CR **091** ⌘**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 **X**

Title: ⌘	Default handling of error cases during IMS registration	
Source: ⌘	CN4	
Work item code:⌘	IMS-CCR	**Date:** ⌘ 20/02/2004
Category: ⌘	**F**	**Release:** ⌘ Rel-6

Use <u>one</u> 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 <u>one</u> 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 current specification of the S-CSCF registration/deregistration notification procedure does not describe all the possible error cases and the appropriate behaviour of the HSS when it is not able to handle the request for error cases not described.
Summary of change:⌘	A text describing the default handling of error cases is added. If the HSS is not able to proceed the received request for other reasons than thoses already described, it shall return the Result-Code 'DIAMETER_UNABLE_TO_COMPLY' to the S-CSCF and shall stop processing the request.
Consequences if ⌘ **not approved:**	Incomplete specification leading to misoperations during IMS registration/deregistration procedures.

Clauses affected: ⌘	6.1.2.1

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

6.1.2.1   Detailed behaviour

On registering/deregistering a public identity the S-CSCF shall inform the HSS. The same procedure is used by the S-CSCF to get the user profile. The relevant user profile downloaded is described in more detailed in the section 6.6. The HSS holds information about the state of registration of all the identities of the user. The S-CSCF uses this procedure to update such state. The HSS shall, in the following order (in case of an error in any of the steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.229 [5]):

1. Check that the user is known. If not Experimental-Result-Code shall be set to DIAMETER_ERROR_USER_UNKNOWN.

2. The HSS may check whether the private and public identities received in the request belong to the same user. If not Experimental-Result-Code shall be set to DIAMETER_ERROR_IDENTITIES_DONT_MATCH.

3. Check the Server Assignment Type value received in the request:

    - If it indicates REGISTRATION or RE_REGISTRATION, the HSS shall download the relevant user public identity information. . If the public identity's authentication pending flag which is specific for the private identity is set, the HSS shall clear it. The Result-Code shall be set to DIAMETER_SUCCESS and the HSS shall set the registration state of the public identity and associated public identities as registered (if not already registered).

      Only one public identity shall be present in the request. If more than one identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and no user information shall be returned.

    - If it indicates UNREGISTERED_USER, the HSS shall store the S-CSCF name, set the registration state of the public identity as unregistered, i.e. registered as a consequence of a terminating call and download the relevant user public identity information. If there are multiple private identities associated to the public identity in the HSS, the HSS shall arbitrarily select one of the private identities and put it into the response message. The Result-Code shall be set to DIAMETER_SUCCESS.

      Only one public identity shall be present in the request. If more than one identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and the modifications specified in the previous paragraph shall not be performed.

    - If it indicates TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION, DEREGISTRATION_TOO_MUCH_DATA or ADMINISTRATIVE_DEREGISTRATION, the HSS shall clear the S-CSCF name associated to the private identity for all the public identities that the S-CSCF indicated in the request and set the registration state of the identities as not registered. If no public identity is present in the request, the private identity shall be present; the HSS shall clear the S-CSCF name for all the public identities associated to the private identity and set their registration state to not registered. The Result-Code shall be set to DIAMETER_SUCCESS.

    - If it indicates TIMEOUT_DEREGISTRATION_STORE_SERVER_NAME or USER_DEREGISTRATION_STORE_SERVER_NAME the HSS decides whether to keep the S-CSCF name associated to the private identity stored or not for all the public identities that the S-CSCF indicated in the request and set the registration state of the identities as unregistered. If no public identity is present in the request, the private identity shall be present. If the HSS decides to keep the S-CSCF name stored the HSS shall keeps the S-CSCF name stored for all the public identities associated to the private identity and set their registration state to unregistered.

      If the HSS decides to keep the S-CSCF name the Result-Code shall be set to DIAMETER_SUCCESS.

      If the HSS decides not to keep the S-CSCF name the Experimental-Result-Code shall be set to DIAMETER_SUCCESS_SERVER_NAME_NOT_STORED. If the HSS received public identities in the request, the HSS shall set the registration state to not registered for the public identity(ies) that the S-CSCF indicated in the request. If the HSS received a private identity in the request, the HSS shall set the registration state of all public identites related to the private identity to not registered.

    - If it indicates NO_ASSIGNMENT, the HSS checks whether the user is assigned for the S-CSCF requesting the data and download the user public identity information requested in the User-Data-Request-Type AVP. The Result-Code shall be set to DIAMETER_SUCCESS. If the requesting S-CSCF is not the same as the assigned S-CSCF, the Result-Code shall be set to DIAMETER_UNABLE_TO COMPLY.

Only one public user identity shall be present in the request. If more than one public identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and no user information shall be returned.

- If it indicates AUTHENTICATION_FAILURE or AUTHENTICATION_TIMEOUT, the HSS shall clear the S-CSCF name for the public identity associated to the private identity that the S-CSCF indicated in the request and set the registration state of the identity as not registered. If the public identity's authentication pending flag which is specific for the private identity is set, the HSS shall clear it. The Result-Code shall be set to DIAMETER_SUCCESS.

Only one public identity shall be present in the request. If more than one identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and the modifications specified in the previous paragraph shall not be performed.

If the HSS cannot fulfil the received request, e.g. due to database error, it shall set the Result-Code to DIAMETER_UNABLE_TO_COMPLY. The HSS shall not modify any user state nor download any user public identity information to the S-CSCF.

See chapter 8.1.2 and 8.1.3 for the description of the handling of the error situations: reception of an S-CSCF name different from the one stored in the HSS and reception of a Server-Assignment-Type value not compatible with the registration state of the user.

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** CR **084** ⌘rev **1** ⌘ Current version: **5.6.0** ⌘

*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: ⌘	Conditions for inclusion of Public Identity in SAR		
Source: ⌘	CN4		
Work item code:⌘	TEI	***Date:*** ⌘	20/01/2004
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 conditions for the inclusion of the Public Identity in the SAR message are not complete. **This is an essential correction.**
Summary of change:⌘	It is added to the conditions for the inclusion of the Public Id in SAR that it shall be present in all cases other than deregistration.
Consequences if not approved: ⌘	The conditions for the inclusion of the Public Identity in SAR are incomplete which may lead to misinterpretation and problems with interworking.

Clauses affected: ⌘	6.1.2

	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.

6.1.2   S-CSCF registration/deregistration notification

This procedure is used between the S-CSCF and the HSS. The procedure is invoked by the S-CSCF, corresponds to the combination of the operations Cx-Put and Cx-Pull (see 3GPP TS 23.228 [1]) and is used:

- To assign an S-CSCF to a public identity, or to clear the name of the S-CSCF assigned to one or more public identities.

- To download from HSS the relevant user profile information that the S-CSCF needs to serve the user.

This procedure is mapped to the commands Server-Assignment-Request/Answer in the Diameter application specified in 3GPP TS 29.229 [5]. Tables 6.1.2.1 and 6.1.2.2 describe the involved information elements.

Table 6.1.2.1: S-CSCF registration/deregistration notification request

Information element name	Mapping to Diameter AVP	Cat.	Description
Public User Identity (See 7.2)	Public-Identity	C	User public identity or list of user public identities. One and only one public identity shall be present if the Server-Assignment-Type is any value other than TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION or ADMINISTRATIVE_DEREGISTRATION. If Server-Assignment-Type ~~equal to TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION or ADMINISTRATIVE_DEREGISTRATION~~indicates deregistration of some type and User-Name is not present in the request, ~~A~~at least one public identity shall be present ~~if User-Name is not present in the request~~.
S-CSCF Name (See 7.4)	Server-Name	M	Name of the S-CSCF.
Private User Identity (See 7.3)	User-Name	C	User private identity. It shall be present if it is available when the S-CSCF issues the request. It may be absent during the initiation of a session to an unregistered user. In such situation, Server-Assignment-Type shall contain the value UNREGISTERED_USER. In case of de-registration, Server-Assignment-Type equal to TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION or ADMINISTRATIVE_DEREGISTRATION, if no Public-Identity AVPs are present then User-Name AVP shall be present.
Server Assignment Type (See 7.8)	Server-Assignment-Type	M	Type of update the S-CSCF requests in the HSS (e.g: de-registration). See 3GPP TS 29.229 [5] for all the possible values.
User Data Request Type (See 7.15)	User-Data-Request-Type	M	Part of the user profile the S-CSCF requests from the HSS (e.g: complete profile). See 3GPP TS 29.229 [5] for all the possible values.
User Data Already Available (See 7.16)	User-Data-Already-Available	M	This indicates if the user profile is already available in the S-CSCF.

Routing Information (See 7.13)	Destination-Host	C	If the S-CSCF knows HSS name Destination-Host AVP shall be present in the command.
			This information is available if the request belongs to an already existing registration, e.g. in case of the re-registration, where the HSS name is stored in the S-CSCF. The HSS name is obtained from the Origin-Host AVP, which is received from the HSS, e.g. included in the MAA command.
			This information may not be available if the command is sent as a consequence of a session termination for an unregistered user. In this case the Destination-Host AVP is not present and the command is routed to the next Diameter node, e.g. SLF, based on the Diameter routing table in the S-CSCF.

CR-Form-v7

CHANGE REQUEST

⌘	**29.228** CR **085**	⌘**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 **X**

Title:	⌘	Conditions for inclusion of Public Identity in SAR
Source:	⌘	CN4

Work item code:	⌘	TEI		***Date:*** ⌘	20/01/2004

Category:	⌘	**A**	***Release:*** ⌘	Rel-6

<table>
<tr><td colspan="2"><i>Use <u>one</u> of the following categories:</i></td><td colspan="2"><i>Use <u>one</u> of the following releases:</i></td></tr>
<tr><td>F (correction)</td><td></td><td>2</td><td>(GSM Phase 2)</td></tr>
<tr><td>A (corresponds to a correction in an earlier release)</td><td></td><td>R96</td><td>(Release 1996)</td></tr>
<tr><td>B (addition of feature),</td><td></td><td>R97</td><td>(Release 1997)</td></tr>
<tr><td>C (functional modification of feature)</td><td></td><td>R98</td><td>(Release 1998)</td></tr>
<tr><td>D (editorial modification)</td><td></td><td>R99</td><td>(Release 1999)</td></tr>
<tr><td colspan="2">Detailed explanations of the above categories can be found in 3GPP <u>TR 21.900</u>.</td><td>Rel-4</td><td>(Release 4)</td></tr>
<tr><td colspan="2"></td><td>Rel-5</td><td>(Release 5)</td></tr>
<tr><td colspan="2"></td><td>Rel-6</td><td>(Release 6)</td></tr>
</table>

Reason for change:	⌘	The conditions for the inclusion of the Public Identity in the SAR message are not complete. **This is an essential correction.**
Summary of change:	⌘	It is added to the conditions for the inclusion of the Public Id in SAR that it shall be present in all cases other than deregistration.
Consequences if not approved:	⌘	The conditions for the inclusion of the Public Identity in SAR are incomplete which may lead to misinterpretation and problems with interworking.

Clauses affected:	⌘	6.1.2

			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.

6.1.2 S-CSCF registration/deregistration notification

This procedure is used between the S-CSCF and the HSS. The procedure is invoked by the S-CSCF, corresponds to the combination of the operations Cx-Put and Cx-Pull (see 3GPP TS 23.228 [1]) and is used:

- To assign an S-CSCF to a public identity, or to clear the name of the S-CSCF assigned to one or more public identities.

- To download from HSS the relevant user profile information that the S-CSCF needs to serve the user.

This procedure is mapped to the commands Server-Assignment-Request/Answer in the Diameter application specified in 3GPP TS 29.229 [5]. Tables 6.1.2.1 and 6.1.2.2 describe the involved information elements.

Table 6.1.2.1: S-CSCF registration/deregistration notification request

Information element name	Mapping to Diameter AVP	Cat.	Description
Public User Identity (See 7.2)	Public-Identity	C	User public identity or list of user public identities. One and only one public identity shall be present if the Server-Assignment-Type is any value other than TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION or ADMINISTRATIVE_DEREGISTRATION. If Server-Assignment-Type indicates deregistration of some type ~~equal to TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION or ADMINISTRATIVE_DEREGISTRATION~~ and User-Name is not present in the request, ~~A~~at least one public identity shall be present ~~if User-Name is not present in the request~~.
S-CSCF Name (See 7.4)	Server-Name	M	Name of the S-CSCF.
Private User Identity (See 7.3)	User-Name	C	User private identity. It shall be present if it is available when the S-CSCF issues the request. It may be absent during the initiation of a session to an unregistered user. In such situation, Server-Assignment-Type shall contain the value UNREGISTERED_USER. In case of de-registration, Server-Assignment-Type equal to TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION or ADMINISTRATIVE_DEREGISTRATION, if no Public-Identity AVPs are present then User-Name AVP shall be present.
Server Assignment Type (See 7.8)	Server-Assignment-Type	M	Type of update the S-CSCF requests in the HSS (e.g: de-registration). See 3GPP TS 29.229 [5] for all the possible values.
User Data Request Type (See 7.15)	User-Data-Request-Type	M	Part of the user profile the S-CSCF requests from the HSS (e.g: complete profile). See 3GPP TS 29.229 [5] for all the possible values.
User Data Already Available (See 7.16)	User-Data-Already-Available	M	This indicates if the user profile is already available in the S-CSCF.

Routing Information (See 7.13)	Destination-Host	C	If the S-CSCF knows HSS name Destination-Host AVP shall be present in the command.
			This information is available if the request belongs to an already existing registration, e.g. in case of the re-registration, where the HSS name is stored in the S-CSCF. The HSS name is obtained from the Origin-Host AVP, which is received from the HSS, e.g. included in the MAA command.
			This information may not be available if the command is sent as a consequence of a session termination for an unregistered user. In this case the Destination-Host AVP is not present and the command is routed to the next Diameter node, e.g. SLF, based on the Diameter routing table in the S-CSCF.

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** CR **086** ⌘ **rev** **1** ⌘ Current version: **5.6.0** ⌘

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: ⌘	Correction to sending the Charging-Information AVP	
Source: ⌘	Nokia	
Work item code: ⌘	IMS-CCR	**Date:** ⌘ 20/02/2004
Category: ⌘	**F**	**Release:** ⌘ Rel-5

Use <u>one</u> 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 <u>one</u> 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 S-CSCF uses the SAR of type NO_ASSIGNMENT to update the user data it has. However currently the HSS can not update the Charging-Information AVP to the S-CSCF if it has changed in SAA if Server-Assignment-Type was NO_ASSIGNMENT. This is an essential correction.
Summary of change: ⌘	It is proposed to send the Charging-Information AVP when the User-Data AVP is sent.
Consequences if not approved: ⌘	Sending of charging function addresses is not possible when the Server-Assignment-Type has value NO_ASSIGNMENT.

Clauses affected: ⌘	6.1.2

	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.

6.1.2 S-CSCF registration/deregistration notification

This procedure is used between the S-CSCF and the HSS. The procedure is invoked by the S-CSCF, corresponds to the combination of the operations Cx-Put and Cx-Pull (see 3GPP TS 23.228 [1]) and is used:

- To assign an S-CSCF to a public identity, or to clear the name of the S-CSCF assigned to one or more public identities.

- To download from HSS the relevant user profile information that the S-CSCF needs to serve the user.

This procedure is mapped to the commands Server-Assignment-Request/Answer in the Diameter application specified in 3GPP TS 29.229 [5]. Tables 6.1.2.1 and 6.1.2.2 describe the involved information elements.

Table 6.1.2.1: S-CSCF registration/deregistration notification request

Information element name	Mapping to Diameter AVP	Cat.	Description
Public User Identity (See 7.2)	Public-Identity	C	User public identity or list of user public identities. At least one public identity shall be present if User-Name is not present in the request.
S-CSCF Name (See 7.4)	Server-Name	M	Name of the S-CSCF.
Private User Identity (See 7.3)	User-Name	C	User private identity. It shall be present if it is available when the S-CSCF issues the request. It may be absent during the initiation of a session to an unregistered user. In such situation, Server-Assignment-Type shall contain the value UNREGISTERED_USER. In case of de-registration, Server-Assignment-Type equal to TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION or ADMINISTRATIVE_DEREGISTRATION, if no Public-Identity AVPs are present then User-Name AVP shall be present.
Server Assignment Type (See 7.8)	Server-Assignment-Type	M	Type of update the S-CSCF requests in the HSS (e.g: de-registration). See 3GPP TS 29.229 [5] for all the possible values.
User Data Request Type (See 7.15)	User-Data-Request-Type	M	Part of the user profile the S-CSCF requests from the HSS (e.g: complete profile). See 3GPP TS 29.229 [5] for all the possible values.
User Data Already Available (See 7.16)	User-Data-Already-Available	M	This indicates if the user profile is already available in the S-CSCF.

Routing Information (See 7.13)	Destination-Host	C	If the S-CSCF knows HSS name Destination-Host AVP shall be present in the command. This information is available if the request belongs to an already existing registration, e.g. in case of the re-registration, where the HSS name is stored in the S-CSCF. The HSS name is obtained from the Origin-Host AVP, which is received from the HSS, e.g. included in the MAA command. This information may not be available if the command is sent as a consequence of a session termination for an unregistered user. In this case the Destination-Host AVP is not present and the command is routed to the next Diameter node, e.g. SLF, based on the Diameter routing table in the S-CSCF.

Table 6.1.2.2: S-CSCF registration/deregistration notification response

Information element name	Mapping to Diameter AVP	Cat.	Description
Private User Identity (See 7.3)	User-Name	C	User private identity. It shall be present if it is available when the HSS sends the response. It may be absent in the following error case: when the Server-Assignment-Type of the request is UNREGISTERED_USER and the received public user identity is not known by the HSS.
Registration result (See 7.6)	Result-Code / Experimental-Result	M	Result of registration. Result-Code AVP shall be used for errors defined in the Diameter Base Protocol. Experimental-Result AVP shall be used for Cx/Dx errors. This is a grouped AVP which contains the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP.
User Profile (See 7.7)	User-Data	C	Relevant user profile. It shall be present when Server-Assignment-Type in the request is equal to NO_ASSIGNMENT. If the Server-Assignment-Type in the request is equal to REGISTRATION, RE_REGISTRATION or UNREGISTERED_USER the User-Data AVP shall be present according to the rules defined in the section 6.6. If the S-CSCF receives more data than it is prepared to accept, it shall perform the de-registration of the user with User-Authorization-Type set to DEREGISTRATION_TOO_MUCH_DATA and send back a SIP 3xx or 480 (Temporarily Unavailable) response, which shall trigger the selection of a new S-CSCF by the I-CSCF, as specified in 3GPP TS 24.229 [8].
Charging Information (See 7.12)	Charging-Information	C	Addresses of the charging functions. It shall be present ~~when Server-Assignment-Type in the request is equal to REGISTRATION, RE_REGISTRATION or UNREGISTERED_USER and when Result-Code is equal to DIAMETER_SUCCESS~~ when the User-Data AVP is sent to the S-CSCF. When this parameter is included, the Primary Charging Collection Function name shall be included. All other elements shall be included if they are available.

CR-Form-v7

CHANGE REQUEST

| ⌘ | **29.228** CR **087** | ⌘**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 **X**

Title: ⌘	Correction to sending the Charging-Information AVP	
Source: ⌘	Nokia	
Work item code:⌘	IMS-CCR	***Date:*** ⌘ 20/02/2004

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 S-CSCF uses the SAR of type NO_ASSIGNMENT to update the user data it has. However currently the HSS can not update the Charging-Information AVP to the S-CSCF if it has changed in SAA if Server-Assignment-Type was NO_ASSIGNMENT.
Summary of change:⌘	It is proposed to send the Charging-Information AVP when the User-Data AVP is sent.
Consequences if ⌘ ***not approved:***	Sending of charging function addresses is not possible when the Server-Assignment-Type has value NO_ASSIGNMENT.

Clauses affected: ⌘	6.1.2

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

Other comments: ⌘	

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6.1.2   S-CSCF registration/deregistration notification

This procedure is used between the S-CSCF and the HSS. The procedure is invoked by the S-CSCF, corresponds to the combination of the operations Cx-Put and Cx-Pull (see 3GPP TS 23.228 [1]) and is used:

- To assign an S-CSCF to a public identity, or to clear the name of the S-CSCF assigned to one or more public identities.

- To download from HSS the relevant user profile information that the S-CSCF needs to serve the user.

This procedure is mapped to the commands Server-Assignment-Request/Answer in the Diameter application specified in 3GPP TS 29.229 [5]. Tables 6.1.2.1 and 6.1.2.2 describe the involved information elements.

Table 6.1.2.1: S-CSCF registration/deregistration notification request

Information element name	Mapping to Diameter AVP	Cat.	Description
Public User Identity (See 7.2)	Public-Identity	C	User public identity or list of user public identities. At least one public identity shall be present if User-Name is not present in the request.
S-CSCF Name (See 7.4)	Server-Name	M	Name of the S-CSCF.
Private User Identity (See 7.3)	User-Name	C	User private identity. It shall be present if it is available when the S-CSCF issues the request. It may be absent during the initiation of a session to an unregistered user. In such situation, Server-Assignment-Type shall contain the value UNREGISTERED_USER. In case of de-registration, Server-Assignment-Type equal to TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION or ADMINISTRATIVE_DEREGISTRATION, if no Public-Identity AVPs are present then User-Name AVP shall be present.
Server Assignment Type (See 7.8)	Server-Assignment-Type	M	Type of update the S-CSCF requests in the HSS (e.g: de-registration). See 3GPP TS 29.229 [5] for all the possible values.
User Data Request Type (See 7.15)	User-Data-Request-Type	M	Part of the user profile the S-CSCF requests from the HSS (e.g: complete profile). See 3GPP TS 29.229 [5] for all the possible values.
User Data Already Available (See 7.16)	User-Data-Already-Available	M	This indicates if the user profile is already available in the S-CSCF.

Routing Information (See 7.13)	Destination-Host	C	If the S-CSCF knows HSS name Destination-Host AVP shall be present in the command. This information is available if the request belongs to an already existing registration, e.g. in case of the re-registration, where the HSS name is stored in the S-CSCF. The HSS name is obtained from the Origin-Host AVP, which is received from the HSS, e.g. included in the MAA command. This information may not be available if the command is sent as a consequence of a session termination for an unregistered user. In this case the Destination-Host AVP is not present and the command is routed to the next Diameter node, e.g. SLF, based on the Diameter routing table in the S-CSCF.

Table 6.1.2.2: S-CSCF registration/deregistration notification response

Information element name	Mapping to Diameter AVP	Cat.	Description
Private User Identity (See 7.3)	User-Name	C	User private identity. It shall be present if it is available when the HSS sends the response. It may be absent in the following error case: when the Server-Assignment-Type of the request is UNREGISTERED_USER and the received public user identity is not known by the HSS.
Registration result (See 7.6)	Result-Code / Experimental-Result	M	Result of registration. Result-Code AVP shall be used for errors defined in the Diameter Base Protocol. Experimental-Result AVP shall be used for Cx/Dx errors. This is a grouped AVP which contains the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP.
User Profile (See 7.7)	User-Data	C	Relevant user profile. It shall be present when Server-Assignment-Type in the request is equal to NO_ASSIGNMENT. If the Server-Assignment-Type in the request is equal to REGISTRATION, RE_REGISTRATION or UNREGISTERED_USER the User-Data AVP shall be present according to the rules defined in the section 6.6. If the S-CSCF receives more data than it is prepared to accept, it shall perform the de-registration of the user with User-Authorization-Type set to DEREGISTRATION_TOO_MUCH_DATA and send back a SIP 3xx or 480 (Temporarily Unavailable) response, which shall trigger the selection of a new S-CSCF by the I-CSCF, as specified in 3GPP TS 24.229 [8].
Charging Information (See 7.12)	Charging-Information	C	Addresses of the charging functions. It shall be present ~~when Server-Assignment-Type in the request is equal to REGISTRATION, RE_REGISTRATION or UNREGISTERED_USER and when Result-Code is equal to DIAMETER_SUCCESS~~ when the User-Data AVP is sent to the S-CSCF. When this parameter is included, the Primary Charging Collection Function address shall be included. All other elements shall be included if they are available.