3GPP TSG CN Plenary Meeting #18 **NP-020590**
4th – 6th December 2002 New Orleans, USA.

Source: TSG CN WG4

Title: Corrections on Error handling in S-CSCF; IMS Cx/Dx-interface

Agenda item: 8.1

Document for: APPROVAL

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
29.228	020	1	N4-021517	Rel-5	Error handling in S-CSCF when receiving too much data	F	5.1.0
29.229	010	1	N4-021518	Rel-5	Error handling in S-CSCF when receiving too much data	F	5.1.0

3GPP TSG-CN4 Meeting #17
Bangkok, Thailand, 11th-15th November, 2002

Tdoc ⌘N4-021517

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** **CR** **020** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	Error handling in S-CSCF when receiving too much data
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	12/11/2002
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:	⌘	During the discussion of N4-021163 on removal of uppers bounds in Cx interface user profile, the comment was given that we should define the error handling for the case where the S-CSCF receives too much user data.
Summary of change:	⌘	The download of user profile information takes place in two operations of Cx interface: 1. S-CSCF registration/deregistration notification This is a pull operation initiated by the S-CSCF. If the S-CSCF is receiving too much data it has no way to tell the HSS that it was overloaded. It is proposed that the S-CSCF de-registers the user and sends back an indication to the I-CSCF that it has to select a new S-CSCF. 2. HSS initiated update of User Profile This is a push operation initiated by the HSS. In this case the S-CSCF can indicate to the HSS that it was overloaded (with an appropriate result code). The HSS shall initiate network initiated de-registration towards the S-CSCF to trigger the selection of a new S-CSCF.
Consequences if not approved:	⌘	There is no way to know when an S-CSCF was no able to deal with an excess of volume of user data.

Clauses affected:	⌘	2, 6.1.2, 6.2.2.1

Other specs affected:	⌘	Y	N		⌘	
		X		Other core specifications		29.229-010
			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.

Beginning of modified section

2 References

…

[8] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP"

End of modified section

Beginning of modified section

6.1.2 S-CSCF registration/deregistration notification

… (text skipped for clarity)

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	M	User private identity.
Registration result (See 7.6)	Result-Code / Vendor-Specific-Result	M	Result of registration.
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 will 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	O	Addresses of the charging functions.

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 Vendor-Specific-Result 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 Vendor-Specific-Result 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 can 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 can 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 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.

   + 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 can 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. See chapter 9.1 for the description on the behaviour of the HSS when the name of the S-CSCF received in the request is different from the name already stored in the HSS.

See chapter 8.1.2 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.

End of modified section

Beginning of modified section

6.2.2.1 Detailed behaviour

The HSS shall make use of this procedure to update relevant user profile information in the S-CSCF.

The S-CSCF shall overwrite, for the identities indicated in the request, current information with the information received from the HSS.

If the S-CSCF receives more data than it can accept, it shall return the corresponding error code to the HSS as indicated in table 6.2.2.1.1. The S-CSCF shall not overwrite the data that it already has to give service to the user. The HSS shall initiate a network-initiated de-registration procedure towards the S-CSCF with Deregistration-Reason set to SERVER_CHANGE, which will trigger the assignment of a new S-CSCF.

Table 6.2.2.1.1 details the valid result codes that the S-CSCF can return in the response.

Table 6.2.2.1.1: User profile response valid result codes

Result-Code AVP value	Condition
DIAMETER_SUCCESS	The request succeeded.
DIAMETER_SUCCESS_NOT_ SUPPORTED_USER_DATA	The request succeeded. However, the S-CSCF informs the HSS that the received subscription data contained information, which was not recognised or supported.
DIAMETER_ERROR_TOO_MUCH_DATA	The request failed. The S-CSCF informs to the HSS that it tried to push too much data into the S-CSCF.
DIAMETER_UNABLE_TO_COMPLY	The request failed.

End of modified section

3GPP TSG-CN4 Meeting #17
Bangkok, Thailand, 11th-15th November, 2002

Tdoc ⌘N4-021518

CR-Form-v7

CHANGE REQUEST

⌘ **29.229** **CR** **010** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	Error handling in S-CSCF when receiving too much data
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	12/11/2002
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:	⌘	During the discussion of N4-021163 on removal of uppers bounds in Cx interface user profile, the comment was given that we should define the error handling for the case where the S-CSCF receives too much user data.
Summary of change:	⌘	Added error code DIAMETER_ERROR_TOO_MUCH_DATA. Added User-Authorization-Type value DEREGISTRATION_EXCESS_OF_DATA. Editorial correction in title of 6.2.1.4.
Consequences if not approved:	⌘	There is no way to know when an S-CSCF was no able to deal with an excess of user data.

Clauses affected:	⌘	2, 6.2.1.4, New 6.2.2.8, 6.3.15, 6.4.2

Other specs affected: ⌘	Y	N		⌘
	X		Other core specifications	29.228-020
		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.

Beginning of modified section

2 References

…

[1] 3GPP TS 29.228 “IP Multimedia (IM) Subsystem Cx and Dx interface; signalling flows and message contents (Release 5)”

[2] 3GPP TS 33.210 “3G Security; Network Domain Security; IP Network Layer Security (Release 5)”

[3] IETF RFC 3261 "SIP: Session Initiation Protocol"

[4] IETF RFC 2396: “Uniform Resource Identifiers (URI): generic syntax”

[5] IETF RFC 2960 “Stream Control Transmission Protocol”

[6] draft-ietf-aaa-diameter-10.txt, “Diameter Base Protocol”, work in progress

[7] IETF RFC 2234 “Augmented BNF for syntax specifications”

[8] IETF RFC 2806 “URLs for Telephone Calls”

[9] draft ietf-aaa-diameter-nasreq-09.txt, “Diameter NASREQ Extensions”, work in progress

[10] IETF RFC 3309: “SCTP Checksum Change”

[11] 3GPP TS 29.329 “Sh Interface based on the Diameter protocol; protocol details”

End of modified section

Beginning of modified section

6.2.1.4 DIAMETER_SUCCESS_NOT_-SUPPORTED_USER_DATA (2004)

The S-CSCF informs HSS that the received subscription data contained information, which was not recognised or supported.

End of modified section

Beginning of new section

6.2.2.8 DIAMETER_ERROR_TOO_MUCH_DATA (5008)

The volume of the data pushed to the receiving entity exceeds its capacity.

NOTE: This error code is also used in 3GPP TS 29.329 [11].

End of new section

Beginning of modified section

6.3.15 Server-Assignment-Type AVP

The Server-Assignment-Type AVP (AVP code 15) is of type Enumerated, and indicates the type of server update being performed in a Server-Assignment-Request operation. The following values are defined:

NO_ASSIGNMENT (0)

This value is used to request from HSS the user profile assigned to one or more public identities, without affecting the registration state of those identities.

REGISTRATION (1)

The request is generated as a consequence of a first registration of an identity.

RE_REGISTRATION (2)

The request corresponds to the re-registration of an identity.

UNREGISTERED_USER (3)

The request is generated because the S-CSCF received an INVITE for a public identity that is not registered.

TIMEOUT_DEREGISTRATION (4)

The SIP registration timer of an identity has expired.

USER_DEREGISTRATION (5)

The S-CSCF has received a user initiated de-registration request.

TIMEOUT_DEREGISTRATION_STORE_SERVER_NAME (6)

The SIP registration timer of an identity has expired. The S-CSCF keeps the user data stored in the S-CSCF and requests HSS to store the S-CSCF name.

USER_DEREGISTRATION_STORE_SERVER_NAME (7)

The S-CSCF has received a user initiated de-registration request. The S-CSCF keeps the user data stored in the S-CSCF and requests HSS to store the S-CSCF name.

ADMINISTRATIVE_DEREGISTRATION (8)

The S-CSCF, due to administrative reasons, has performed the de-registration of an identity.

AUTHENTICATION_FAILURE (9)

The authentication of a user has failed.

AUTHENTICATION_TIMEOUT (10)

The authentication timeout has expired.

DEREGISTRATION_TOO_MUCH_DATA (11)

The S-CSCF has requested user profile information from the HSS and has received a volume of data higher than it can accept.

End of modified section

Beginning of modified section

6.4.2 Vendor-Specific-Result-Code AVP values

This specification has assigned Vendor-Specific-Result-Code AVP values 2001-2005 and 5001-~~5007~~5008. See section 6.2.

End of modified section