**3GPP TSG-CT WG1 Meeting #130-eC1-213611**

**Electronic meeting, 20-28 May 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.229** | **CR** | **6526** | **rev** | **1** | **Current version:** | **16.9.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **x** |

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| ***Title:*** | S-CSCF reselection in eIMS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eIMS5G\_SBA | | | | |  | ***Date:*** | | | 2021-05-25 |
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| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change 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](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) ... Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | When using service based architecture it is not possible to reselect a new S-CSCF in case of failure of the currently assigned S-CSCF due to a missing indication:  In Diameter based solution there is a specific indication from the I-CSCF in Cx-UAR and Cx-LIR leading to that the reassignment pending flag in HSS is set, which will allow registration of a new S-CSCF. However there is no procedure to set this flag in the current Nhss specification.  A simpler solution is specified in CR#0115 in 23.380, which introduces an explicit indication during the S-CSCF registration procedure. This limits dependencies between SBI operations and avoids the use of intermediate state flags.  When the I-CSCF detects that the assigned S-CSCF is not available and a new S-CSCF is selected, the I-CSCF includes an S-CSCF reselection indicator in the SIP message towards S-CSCF. The new S-CSCF also includes this indication in the S-CSCF registration request, so the HSS can authorize the new S-CSCF assignment.  This solution can be applied to Diameter based solution as well.  This CR proposes that the S-CSCF indication is specified as a new SIP URI parameter analogously to the specification of the "orig" parameter. Since this parameter is only within a single network IANA registration is not necessary. | | | | | | | | |
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| ***Summary of change:*** | | Adding “S-CSCF reselection indication” in the SIP request sent from the I-CSCF to the S-CSCF. | | | | | | | | |
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| ***Consequences if not approved:*** | | Network recovery after S-CSCF failure is not possible. | | | | | | | | |
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| ***Clauses affected:*** | | 5.3.1.3, 5.3.2.2, 7.2A.X (new), 7.2A.X.1 (new)7.2A.X.2 (new)7.2A.X.3 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **x** |  | Other core specifications | | | | TS 23.380 CR 0115 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | rev 1: Corrected a few editorials and clarified the use of the parameter | | | | | | | | |

\* \* \* First Change \* \* \* \*

#### 5.3.1.3 Abnormal cases

In the case of SLF query, if the SLF does not send HSS address to the I-CSCF, the I-CSCF shall send back a 403 (Forbidden) response to the UE.

If the HSS sends a negative response to the user registration status query request, the I-CSCF shall send back a 403 (Forbidden) response.

If the user registration status query procedure cannot be completed, e.g. due to time-out or incorrect information from the HSS, the I-CSCF shall send back a 480 (Temporarily Unavailable) response to the UE.

If a selected S-CSCF:

- does not respond to the REGISTER request and its retransmissions by the I-CSCF; or

- sends back a 3xx response or 480 (Temporarily Unavailable) response to a REGISTER request;

and:

- the REGISTER request did not include an "integrity-protected" header field parameter in the Authorization header field;

- the REGISTER request did include an "integrity-protected" header field parameter in the Authorization header field with a value set to "no" in the Authorization header field;

- the REGISTER request did include an "integrity-protected" header field parameter in the Authorization header field with a value set to other than "no" and the I-CSCF supports S-CSCF restoration procedures; or

- the REGISTER request did not include an Authorization header field and the I-CSCF supports S-CSCF restoration procedures;

then:

- if the I-CSCF has received the list of capabilities from the HSS, the I-CSCF shall select a new S-CSCF as described in subclause 5.3.1.2, based on the capabilities indicated from the HSS. The newly selected S-CSCF shall not be one of any S-CSCFs selected previously during this same registration procedure; or

- if the I-CSCF has received a valid SIP URI from the HSS because the S-CSCF is already assigned to other UEs sharing the same public user identity, it will request the list of capabilities from the HSS and, on receiving these capabilities, the I-CSCF shall select a new S-CSCF as described in subclause 5.3.1.2, based on the capabilities indicated from the HSS. The newly selected S-CSCF shall not be one of any S-CSCFs selected previously during this same registration procedure.

NOTE 1: Checking for the inclusion of the Authorization header field is necessary to prevent S-CSCF reselection in the case of GPRS-IMS-Bundled authentication or NASS-IMS bundled authentication when no Authorization header field is present in case I-CSCF does not support S-CSCF restoration procedures.

NOTE 2: In case the S-CSCF does not respond, the I-CSCF can apply a pre-configured timer based on local policy before re-selecting a new S-CSCF.

When forwarding the REGISTER request to the new S-CSCF, the I-CSCF includes the SIP URI parameter "scscf-reselection" to the Request-URI of the REGISTER request.

If a selected S-CSCF does not respond to a REGISTER request and its retransmissions by the I-CSCF and none of the conditions specified above in this case are fulfilled, the I-CSCF shall send back a or 504 (Server Time-Out) response to the user, in accordance with the procedures in RFC 3261 [26].

If the I-CSCF cannot select a S-CSCF which fulfils the mandatory capabilities indicated by the HSS, the I-CSCF shall send back a 600 (Busy Everywhere) response to the user.

#### 5.3.2.2 Abnormal cases

In the case of SLF query, if the SLF does not send HSS address to the I-CSCF, the I-CSCF shall send back a 404 (Not Found) response to the UE.

Upon successful user location query, when the response contains the URI of the assigned S-CSCF, if the I‑CSCF is unable to contact the assigned S-CSCF, as determined by one of the following:

- the S-CSCF does not respond to the service request and its retransmissions by the I-CSCF; or

- by unspecified means available to the I-CSCF;

and:

- the I-CSCF supports S-CSCF restoration procedures;

then:

- the I-CSCF shall explicitly request the list of capabilities from the HSS and, on receiving these capabilities, the I-CSCF shall select a new S-CSCF, based on the capabilities indicated from the HSS. The newly selected S-CSCF shall not be one of any S-CSCFs selected previously during this same terminating procedure. Re-selection shall be performed until SIP transaction timer expires as specified in RFC 3261 [26]. When forwarding the request to the new S-CSCF, the I-CSCF includes the SIP URI parameter "scscf-reselection" to the Request-URI of the request.

NOTE 1: These procedures do not prevent the usage of unspecified reliability or recovery techniques above and beyond those specified in this subclause.

Upon successful user location query, when the response contains information about the required S-CSCF capabilities, if the I-CSCF is unable to contact a selected S-CSCF, as determined by one of the following:

- the S-CSCF does not respond to the service request and its retransmissions by the I-CSCF; or

- by unspecified means available to the I-CSCF;

then:

- the I-CSCF shall select a new S-CSCF, based on the capabilities indicated from the HSS. The newly selected S‑CSCF shall not be one of any S-CSCFs selected previously during this same terminating procedure. Re-selection shall be performed until SIP transaction timer expires as specified in RFC 3261 [26]. When forwarding the request to the new S-CSCF, the I-CSCF includes the SIP URI parameter "scscf-reselection" to the Request-URI of the request.

NOTE 2: These procedures do not prevent the usage of unspecified reliability or recovery techniques above and beyond those specified in this subclause.

If the I-CSCF receives a negative response to the user location query, the I-CSCF shall send back a 404 (Not Found) response.

If the I-CSCF receives a CANCEL request and if the I-CSCF finds an internal state indicating a pending Cx transaction with the HSS, the I-CSCF:

- shall answer the CANCEL request with a 200 (OK) response; and

- shall answer the original request with a 487 (Request Terminated) response.

NOTE 3: The I-CSCF will discard any later arriving (pending) Cx answer message from the HSS.

With the exception of 305 (Use Proxy) response, the I-CSCF may recurse on a 3xx response only when the domain part of the URI contained in the 3xx response is in the same domain as the I-CSCF. For the same cases, if the URI is an IP address, the I-CSCF shall only recurse if the IP address is known locally to be a address that represents the same domain as the I-CSCF.

### 7.2A.X scscf-reselection parameter definition

#### 7.2A.X.1 Introduction

The "scscf-reselection" parameter is a SIP URI parameter intended to:

- inform the S-CSCF it has been reselected due to failure of the previously assigned S-CSCF;

#### 7.2A.X.2 Syntax

The syntax for the scscf-reselection parameter is specified in table 7.2A.X:

Table 7.2A.X: Syntax of scscf-reselection parameter

uri-parameter =/ scscf-reselection

scscf-reselection = "scscf-reselection"

The BNF for uri-parameter is taken from RFC 3261 [26] and extended accordingly.

#### 7.2A.X.3 Operation

The "scscf-reselection" parameter is appended to the address of the S-CSCF by the I-CSCF, upon failed communication with the currently assigned S-CSCF. The S-CSCF receiving this parameter includes the S-CSCF reselection indicator set to "true" in the S-CSCF Registration procedure with the HSS, as described in 3GPP TS 29.562 [274], so the change of S-CSCF is accepted by the HSS.

\* \* \* End of Changes \* \* \* \*