**3GPP TSG-SA6 Meeting #52-bis-e *S6-230114***

**Online, , 11th Jan 2023 - 20th Jan 2023**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.558** | **CR** | **0142** | **rev** | **2** | **Current version:** | **18.1.0** |  |
|  | | | | | | | | |
| *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 |  |

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| ***Title:*** | ACR update in service continuity planning | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Lenovo Future Communications | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | EDGEAPP\_Ph2 | | | | |  | ***Date:*** | | | 2023-01-10 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In TR 23.700-98, Solution #6 (ACR update in service continuity planning) provided enhancements on the service continuity planning, and in particular the ACR modification procedure. In this contribution, enhancements are proposed for 23.558, based on the concluded sol#6 in 23.700-98 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Clause 8.8.1.x was added to describe the ACR update in SCP, and the procedures were added om 8.8.3.x.1 and 8.8.3.x.2 for the EEC-based and EES-based ACR modifications accordingly. Finally, clauses 8.8.4.xx/xy/xz introduce the new information flows related to the new procedures, and in clause 8.8.4.8 the ACR modification notification is mentioned as part of the target information notification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The ACR update feature will not be specified. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 8.8.1.x (new), 8.8.3.x (new), 8.8.4.xx (new), 8.8.4.xy (new), 8.8.4.xz (new), 8.8.4.8 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **N** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **N** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **N** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | KI #3, Solution #6 | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* \* \* \* \* FIRST CHANGE \* \* \* \* \* \* \*

#### 8.8.1.x ACR update in service continuity planning

Enhancement of the service continuity planning capability is expected to support update of ACR. This happens due to the fact that an expected or predicted UE mobility may not be accurate, and the UE is not at the target location at the given time instance. As can be seen at the Figure 8.8.1.x, this feature introduces the ACR update capabilities as enhancements after the ACR launch to deal with UE behavior changes. This includes a Detection entity, a Decision Update entity and an ACR update execution entity. These entities can be different based on the scenarios identified in clause 8.8.2.



Figure 8.8.1.x: high level illustration of proposed service continuity planning enhancement

This feature can have two different variants based on the type of service continuity planning update. One possible variant is to modify the ACR service after the launch (described in 8.8.3.4) and another possible variant is the pause of the ACR services for a pre-defined time or till the detection entity decides to resume the ACR (described implicitly in 8.8.3.x.1 as part of EEC-based modification procedure). ACR pause allows the EEC after the detection of an expected/predicted UE location and/or mobility change with low confidence level, to decide on pausing the ACR and to send to S-EES/T-EES the pause decision and the required time for the pause, or under which criteria the ACR will resume (or a further ACR modification request may follow after some time period if EEC identifies that ACR can continue). ACR pause operation defines an ACR pause indication message which indicates that the ACR needs to pause and optionally an ACR resume message the resume of the ACR. When ACR is paused, the ACR execution is halted either till a new ACR modification request (including the ACR resume modification type) occurs or after a certain amount of time (as the new IE on ACR pause configuration suggests).

\* \* \* \* \* \* \* SECOND CHANGE \* \* \* \* \* \* \*

#### 8.8.3.x ACR modification procedure

##### 8.8.3.x.1 EEC-based ACR modification procedure

Pre-conditions:

1. The ACR has been launched.
2. EEC has subscribed for events related to ACR modification notification.



Figure 8.8.3.x.1-1: EEC-based ACR modification procedure

1. The EEC detects a change of the expected UE behaviour.

2. The EEC identifies that one or more ACR updates are needed based on the change of the UE behaviour and decides the type of the ACR update to be an ACR modification or an ACR pause/resume. ACR pause or resume can be a variant of ACR modification and indicates that the ACR needs to be halted for a given time or till further notice (e.g. an ACR resume as ACR update may be decided after some time period if EEC identifies that ACR can continue).

3. The EEC sends an ACR modification request to the S-EES or T-EES (for EEC executed ACR via T-EES scenario) to indicate an ACR modification (which can be related to ACR parameters update, or indication of an ACR pause or ACR resume) and to provide the updated parameters, such as the predicted expiration time. The request also includes the necessary parameters (e.g. IDs) to indicate the ACR that is requested to be updated. In case of ACR pause, this message indicates the request for an ACR pause and can provide the duration for the pause (time to wait) or under which criteria the ACR is expected to resume. In case of ACR resume, this message indicates the request for an ACR to be resumed after a pause.

4. S-EES or T-EES determines the ACR to be modified based on the request in step 3. This step is based on the procedure for communicating ACR parameters (as in clause8.8.3.9)

5. The S-EES (or T-EES for EEC executed ACR via T-EES scenario) sends an ACR modification response to the EEC to notify on the result.

6. The EEC may optionally provide a notification to the AC (over EDGE-5) to inform on the ACR modification result.

##### 8.8.3.x.2 EES-based modification procedure

Pre-conditions:

1. The ACR has been launched.
2. EEC has subscribed for events related to ACR modification notification.



Figure 7.6.2.1.2-1: S-EES-based ACR modification procedure

1. The S-EES detects a change of the expected UE behaviour. In particular, S-EES acting as AF, may receive a UE location report or a monitoring event report from 5GC (assuming that S-EES has subscribed to consume 5GC services like LCS or NEF monitoring events related to UE actual location, or UE mobility analytics from NWDAF). Such UE location report or monitoring event report may help indicating that the UE is not going to be at the predicted location at the given time and is expected to deviate by the original planning (based on measurements or analytics).

2. The S-EES identifies that one or more ACR updates are needed based on the information on the change of the UE behaviour. The S-EES then decides for each ACR, the type of the ACR update to be an ACR modification and the parameters that need to be updated, such as the predicted expiration time.

3. S-EES or T-EES determines the ACR(s) to be modified based on the decision in step 2. This step is based on the procedure for communicating ACR parameters (as in clause8.8.3.9)

4. The S-EES sends an ACR modification notification to EEC to notify on the result., based on the subscription to target information notification.

5. The EEC may optionally provide a notification to the AC (over EDGE-5) to inform on the ACR that is modified.

\* \* \* \* \* \* \* THIRD CHANGE \* \* \* \* \* \* \*

#### 8.8.4.xx ACR modification request

Table 8.8.4.xx-1 describes the information elements for an ACR modification request from the EEC to the EES.

Table 8.8.4.xx-1: ACR modification request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Requestor Identifier | M | Unique identifier of the requestor (i.e. EECID). |
| Security credentials | M | Security credentials resulting from a successful authorization for the edge computing service. |
| UE identifier | M | The identifier of the UE (i.e. GPSI). |
| ACID | O | The identifier of the AC. |
| S-EAS Endpoint | M | Endpoint information (e.g. URI, FQDN, IP 3-tuple) of the S-EAS. |
| T-EAS Endpoint | M | Endpoint information (e.g. URI, FQDN, IP 3-tuple) of the T-EAS. |
| ACR modification type | M | Indicates the ACR modification type (ACR parameters update, ACR pause, ACR resume) |
| >ACR pause configuration | O | The configuration parameters if the ACR modification type is pause |
| >> time to wait | O | The time to wait before resuming ACR |
| ACR parameters | M |  |
| > updated prediction expiration time | O | The updated estimated time the UE may reach the Predicted/Expected UE location or EAS service area at the latest |

#### 8.8.4.xy ACR modification response

Table 8.8.4.xy-1 describes the information elements for an ACR modification response from the EES to the EEC.

Table 8.8.4.xy-1: ACR modification response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Result | M | Indicates whether the request is successful or failure |
| Cause information | O | Indicates the cause information for the failure of the ACR modification |

#### 8.8.4.xz ACR modification notification

Table 8.8.4.xz-1 describes the information elements for an ACR modification notification from the EES to the EEC.

Table 8.8.4.xz-1: ACR modification notification

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Result | M | Indication of success or failure of the ACR modification |

\* \* \* \* \* \* \* FOURTH CHANGE \* \* \* \* \* \* \*

#### 8.8.4.8 ACR information subscription request

Table 8.8.4.8-1 describes the information elements for ACR information subscription request from the EEC to the EES.

Table 8.8.4.8-1: ACR information subscription request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| EECID | M | Unique identifier of the EEC. |
| UE Identifier | O | The identifier of the UE (i.e. GPSI or identity token) |
| Security credentials | M | Security credentials resulting from a successful authorization for the edge computing service. |
| EASID(s) | M | The identifier of the EAS(s) |
| ACID(s) | O  (NOTE) | The identifier of the AC(s) |
| Event ID(s) | M | Event ID:  - Target information notification  - ACR complete- ACR modification notification |
| Notification target address | M | Notification target address |
| Proposed expiration time | O | Proposed expiration time for the subscription |
| NOTE: If ACID(s) IE is not included, it implies that the subscription corresponds to all ACs that can be served by the EAS(s) included the this message. | | |