**3GPP TSG-SA WG6 Meeting #46-e S6-212639**

**e-meeting, 15th – 23rd November 2021 (revision of S6-212315)**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.558** | **CR** | **0061** | **rev** | **1** | **Current version:** | **17.1.0** |  |
|  | | | | | | | | |
| *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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Resolving the mismatch of selected ACR scenario between EEC and EAS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | S6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | EDGEAPP | | | | |  | ***Date:*** | | | 2021-11-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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:*** | | The issue of ACR scenario co-existence is still not resloved in release 17, and related EN is remained in 23.558 specification.  Editor's note: whether the scenarios are overlapping and how to solve any co-existence issues are FFS.  In current specification, multiple entities can detect ACR event and perform ACR procedure, so it may happen AC(s)/EEC has different capabilities with EAS(s)/EES, and select different approaches.  Firstly, the EES has all the information from UE side (AC profile) and EAS side regarding the ACR scenarios supported by the respective entities.  Secondly, not all ACR scenarios supported by ACs may be deployed by the EES.  So, EES is the best entity to determine which ACR approach can be enabled for the AC and EAS considering the detailed information (e.g EAS features, KPIs) of both the AC and the EAS and thus also avoiding the overlap of ACR initiations by multiple entities which introduce unnecessary signalling to resolve co-existence issues. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Add solution of ACR approach determination 2. Removed Editor's Note on ACR scenario co-existence and overlap | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Error will be caused due to conflicting of selected ACR approches by different parties. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 8.4.2.2.2, 8.4.2.3.3, 8.4.3.2.2, 8.4.3.3.3, 8.8.2.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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

8.5.2.2 Request-response model

Pre-conditions:

1. The EEC has received information (e.g. URI, IP address) related to the EES;

2. The EEC has received appropriate security credentials authorizing it to communicate with the EES as specified in clause 8.11; and

3. The EES is configured with ECSP's policy for EAS discovery.

NOTE 1: Details of ECSP's policy are out of scope.

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**Figure 8.5.2.2-1: EAS Discovery procedure**

1. The EEC sends an EAS discovery request to the EES. The EAS discovery request includes the requestor identifier [EECID] along with the security credentials and may include EAS discovery filters and may also include UE location to retrieve information about particular EAS(s) or a category of EASs, e.g. gaming applications, or Edge Applications Server(s) available in certain service areas, e.g. available on a UE's predicted or expected route.

2. Upon receiving the request from the EEC, the EES checks if the EEC is authorized to discover the requested EAS(s). The authorization check may apply to an individual EAS, a category of EASs or to the EDN, i.e. to all the EASs. The EES may utilize the capabilities (e.g. UE location) of the 3GPP core network as specified in clause 8.10.3. If EAS discovery filters are provided by the EEC, the EES identifies the EAS(s) based on the provided EAS discovery filters and the UE location. If the EEC indicates that service continuity support is required, the EES shall take the indication which ACR scenarios are supported by the AC and the EEC and which of these are preferred by the AC into consideration.

When EAS discovery filters are not provided, then:

- if available, the EES identifies the EAS(s) based on the UE-specific service information at the EES and the UE location;

- EES identifies the EAS(s) by applying the ECSP policy (e.g. based only on the UE location);

NOTE 2: Details of the UE-specific service information and how it is available at the EES is out of scope.

NOTE 3: Both steps are evaluated prior to sending a response.

Upon receiving the request from the EEC, the EES may trigger the EAS management system to instantiate the EAS that matches with EAS discovery filter IEs (e.g. ACID) as in clause 8.12.

3. If the processing of the request was successful, the EES sends an EAS discovery response to the EEC, which includes information about the discovered EASs. For discovered EASs, this includes endpoint information. Depending on the EAS discovery filters received in the EAS discovery request, the response may include additional information regarding matched capabilities, e.g. service permissions levels, KPIs, AC locations(s) that the EASs can support, ACR scenarios supported by the EAS, etc. The EAS discovery response may contain a list of EASs. This list may be based on EAS discovery filters containing a Geographical or Topological Service Area, e.g. a route, included in the EAS discovery request by the EEC. The EAS discovery response may also include the Selected ACR approach for one specific AC.

If the EES is unable to determine the EAS information using the inputs in the EAS discovery request, UE-specific service information at the EES or the ECSP policy, the EES shall reject the EAS discovery request and respond with an appropriate failure cause.

If the EEC is not registered with the EES, and ECSP policy requires the EEC to perform EEC registration prior to EAS discovery, the EES shall include an appropriate failure cause in the EAS discovery response indicating that EEC registration is required.

If the UE location and predicted/expected UE locations, provided in the EAS discovery request, are outside the Geographical or Topological Service Area of an EAS, then the EES shall not include that EAS in the discovery response. The discovery response may include EAS(s) that cannot serve the UE at its current location if a predicted/expected UE location was provided in the EAS discovery request.

Upon receiving the EAS discovery response, the EEC uses the endpoint information for routing of the outgoing application data traffic to EAS(s), as needed, and may provide necessary notifications to the AC(s). The EEC may use the border or overlap between EAS Geographical Service Areas for service continuity purposes. The EEC may cache the EAS information (e.g. EAS endpoint) for subsequent use and avoid the need to repeat step 1. If the Lifetime IE is included in the response, the EEC may cache the EAS information only for the duration specified by the Lifetime IE.

NOTE 4: Within the duration specified by the Lifetime IE, the cached EAS Profile can be updated (e.g. according to notifications from the EES for changes of EAS information due to EAS status change) or the cached EAS Profile can be invalidated due to new EAS information discovery (e.g. due to UE mobility). The EEC can update or invalidate the cached EAS information (e.g. on PDU Session Release or Modification Command).

NOTE 5: The AC can cache the EAS information (e.g. EAS endpoint) for subsequent use. In the case of the cached information needing to be updated or invalidated, the mechanisms for the EEC to notify the AC is up to implementation and is not specified in the current release of the present document.

NOTE 6: The EEC can use the EAS information provided by the discovery procedure to perform service continuity planning, for example when ultra-low latency ACR is required.

If the EAS discovery request fails, the EEC may resend the EAS discovery request, taking into account the received failure cause. If the failure cause indicated that EEC registration is required, the EEC shall perform an EEC registration before resending the EAS discovery request.

\* \* \* Next Change \* \* \* \*

#### 8.5.3.3 EAS discovery response

Table 8.5.3.3-1 describes information elements for the EAS discovery response from the EES to the EEC.

**Table 8.5.3.3-1: EAS discovery response**

|  |  |  |
| --- | --- | --- |
| **Information element** | **Status** | **Description** |
| Successful response | O | Indicates that the EAS discovery request was successful. |
| > Discovered EAS list | O | List of discovered EAS(s). Each element includes the information described below. |
| >> EAS profile | M | Profile of the EAS. Each element is described in clause 8.2.4 |
| >> Selected ACR approach | O | Indicates for one specific AC which ACR approach is selected for service continuity. |
| >> Lifetime | O | Time interval or duration during which the information elements in the EAS profile is valid and supposed to be cached in the EEC (e.g. time-to-live value for an EAS Endpoint) |
| Failure response | O | Indicates that the EAS discovery request failed. |
| > Cause | O | Indicates the cause of EAS discovery request failure. |

\* \* \* Next Change \* \* \* \*

##### 8.6.4.2.3 Notify

Figure 8.6.4.2.3-1 illustrates the AC information notification procedure between the EES and the EAS.

Pre-conditions:

1. The EAS subscribed for AC information at the EES.



Figure 8.6.4.2.3-1: AC information notification

1. The EES is triggered for AC information updates, e.g. it receives an EEC registration request, it determines if it matches the filter provided by the EAS, e.g. if the AC Geographical Service Area is included in the EAS provided Geographical Service Area.

2. The EES sends an AC information notification to the EAS, which may include the Selected ACR approach to indicate for a specific AC which ACR approach is selected for service continuity.

\* \* \* Next Change \* \* \* \*

##### 8.6.4.3.4 AC information notification

Table 8.6.4.3.4-1 describes the information flow for an AC information notification from the EES to the EAS.

Table 8.6.4.3.4-1: AC information notification

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Subscription Identifier | M | Subscription identifier for which the notification is generated. |
| List of clients | O | List of clients matched based on the given filtering criteria, with elements listed below |
| >AC Profile(s) | M | Profiles of ACs as described in Table 8.2.2-1. |
| >UE ID(s) | O | UE identifier for the UE hosting the AC |
| >UE location(s) | O | UE location for the UE hosting the AC |
| >Selected ACR approach | O | Indicates for a specific AC which ACR approach is selected for service continuity. |

\* \* \* Next Change \* \* \* \*

#### 8.8.2.1 General

The scenarios in the following clauses are different with regards to

a) whether the EEC is involved in the detection phase and decision phase;

b) whether T-EAS discovery is performed between EEC and T-EES or between S-EES and T-EES;

c) whether the EEC sends an Application Context Relocation Request towards the S-EES, the T-EES or none at all; and

d) whether the Application Context is pushed from the S-EAS to the T-EAS or pulled by the T-EAS from S-EAS.

Generally, AC, EEC, EES and EAS implementations will support only a subset of these scenarios; therefore, during EAS discovery and T-EAS discovery the S-EES and T-EES shall take the ACR scenarios supported by the AC and EEC and any preferences indicated by the EEC for specific ACR scenarios into account when identifying the EAS(s) for the EAS discovery response, as specified in clause 8.5.2.2 and clause 8.8.3.2, or for the EAS discovery notification, as specified in clause 8.5.2.3.3.

Furthermore, when the EEC performs EAS discovery or T-EAS discovery, the EES or T-EES shall inform the EEC about the ACR scenarios which are supported by the EAS or T-EAS, respectively.

The EEC shall take the information about supported ACR scenarios provided by the ECS, S-EES and T-EES into account when selecting an EES for EAS discovery or T-EAS discovery, respectively, and when selecting an EAS for edge services.

For each of the scenarios in clauses 8.8.2.2, 8.8.2.3, 8.8.2.4, 8.8.2.5 and 8.8.2.6, performing the ACR procedure for one or more ACs can result in the same EEC receiving services from more than one EES, which have the registration for the required EASs that can serve the ACs. In scenarios described in clause 8.8.2.4 and clause 8.8.2.5, a successful EEC context relocation procedure enables the EEC to become implicitly registered to the target EES without the EEC sending an explicit EEC registration request.

\* \* \* End of Change \* \* \* \*