**3GPP TSG-SA WG6 Meeting #45 S6-211969**

**e-meeting, 25th August – 3rd September 2021 (revision of S6-211836)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.558** | **CR** | **0008** | **rev** | **3** | **Current version:** | **17.0.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | EEC context relocation | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | S6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | EDGEAPP | | | | |  | ***Date:*** | | | 2021-08-19 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | Multiple pieces are missing for EEC context relocation to function correctly. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Handling of EEC context relocation during EEC registration is completed. 2. It is clarified that if EEC registration is being done as part of ACR, the EEC does not include the EEC context details to avoid unnecessary relocation of EEC context to multiple candidate T-EAS. 3. In ACR scenarios #1 to #4 the S-EES relocates the EEC context to the selected T-EES using the EEC Context Push procedures. 4. In ACR scenario #5, the T-EES pulls the context from the S-EES. 5. EEC uses the 'ACR request' to provide the EEC context details to the T-EES. 6. An ACR ststus update procedure is added based on S6-211795. 7. An ACT status subscription is added for EELManagedACR based on S6-211800. 8. Related APIs are updated. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | EEC context relocation remains incomplete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.5.10, 6.7.2, 8.4.2.2.2, 8.4.2.3.2, 8.4.2.3.3, 8.8.2, 8.8.2.1, 8.8.2.2, 8.8.2.3, 8.8.2.4, 8.8.2.5, 8.8.2.6, 8.8.3.6, 8.8.3.6.1, 8.8.3.6.2, 8.8.3.6.2.1 (NEW), 8.8.3.6.2.2, 8.8.3.6.2.3 (NEW), 8.8.3.6.2.4 (NEW), 8.8.3.x (NEW), 8.8.4.4, 8.8.4.10, 8.8.4.x (NEW), 8.8.4.y (NEW), 8.8.4.a (NEW), 8.8.4.b (NEW), 8.8.4.c (NEW), 8.8.5.1, 8.8.5.6, 8.8.5.6.1, 8.8.5.6.2, 8.8.5.6.3 (NEW), 8.8.5.6.4 (NEW), 8.8.5.x (NEW), 8.8.5.x.1 (NEW), 8.8.5.x.2 (NEW) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Rev 2: The CR absorbs S6-211795 and S6-211800.  Rev 3: Editorials and corrections (tracked as Samsung (SA6#45-e rev1)). | | | | | | | | |

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

### 6.5.10 EDGE-9

EDGE-9 reference point enables interactions between two EESs. EDGE-9 reference point may be provided between EES within different EDN (Figure 6.5.10-1) and within the same EDN (Figure 6.5.10-2).



Figure 6.5.10-1: Inter-EDN EDGE-9



Figure 6.5.10-2: Intra-EDN EDGE-9

EDGE-9 supports:

a) discovery of T-EAS information to support ACR; and

b) EEC context relocation procedures.

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

### 6.7.2 APIs provided by the Edge Enabler Layer

Table 6.7.2-1 summarizes the APIs exposed by the ECS.

Table 6.7.2-1: APIs provided by the ECS

|  |  |  |
| --- | --- | --- |
| API Name | Known Consumers | References |
| Eecs\_ServiceProvisioning | EEC | 8.3 |
| Eecs\_EESRegistration | EES | 8.4.4 |
| Eecs\_TargetEESDiscovery | EES | 8.8.3.3 |

Table 6.7.2-2 summarizes the APIs exposed the EES.

Table 6.7.2-2: APIs provided by the EES

|  |  |  |
| --- | --- | --- |
| API Name | Known Consumers | References |
| Eees\_EECRegistration | EEC | 8.4.2 |
| Eees\_EASRegistration | EAS | 8.4.3 |
| Eees\_EASDiscovery | EEC | 8.5 |
| Eees\_UELocation | EAS | 8.6.2 |
| Eees\_ACRManagementEvent | EAS | 8.6.3 |
| Eees\_AppClientInformation | EAS | 8.6.4 |
| Eees\_UEIdentifier | EAS | 8.6.5 |
| Eees\_SessionWithQoS | EAS | 8.6.6 |
| Eees\_TargetEASDiscovery | EAS, EES | 8.8.3.2 |
| Eees\_AppContextRelocation | EEC, EAS | 8.8.3.4 |
| Eees\_ACREvents | EEC | 8.8.3.5 |
| Eees\_AutomatedACR | EAS | 8.8.3.6 |
| Eees\_EECContextPull | EES | 8.9.4.2 |
| Eees\_EECContextPush | EES | 8.9.4.3 |
| Eees\_SelectedTargetEAS | EAS | 8.8.3.7 |
| Eees\_ACRStatusUpdate | EAS | 8.8.3.x |

NOTE: The event exposure related APIs (e.g. Eees\_EASDiscovery and Eees\_ACREvents) can be realized as single event subscription API.

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

##### 8.4.2.2.2 EEC registration

Figure 8.4.2.2.2-1 illustrates EEC registration procedure.

Pre-conditions:

1. The EEC is authorized to access the EES for the purpose of performing registration and has received relevant security credentials as specified in clause 8.11; and

2. The EEC has received service provisioning information from the ECS, including information for accessing the EES.



Figure 8.4.2.2.2-1: EEC registration procedure

1. The EEC sends EEC registration request to the EES. The request from the client includes the security credentials received after successful authorization for edge computing services and may include a proposed expiration time. The request also optionally includes information indicating to the EES how the EEC expects to use the services of the EES.

If the EEC is moving to this EES from the purview of another EES, called S-EES, the request from the EEC may include the identity and endpoint of the S-EES and an EEC context ID that was provided by the S-EES to maintain continuity of the EEC context and to authorize EEC context relocation. If the EEC registration is being performed as part of ACR procedures, the EEC shall not include the S-EES endpoint and the EEC context ID.

2. Upon receiving the request from the EEC, the EES validates the registration request and verifies the security credentials. The EES further determines whether the requirements that were indicated in the AC Profile(s) can be fulfilled and reserves corresponding resources.

3. Upon successful validation of the request, if the received EEC registration request contains an EEC context ID and a S-EES Endpoint, the EES performs a EEC Context Pull relocation (clause 8.9.2.2) from the S-EES. The source and target EES perform EEC Context handling as detailed in clause 8.9.1.

NOTE 1: Only a single EEC Context ID may be provided in the EEC registration request.

NOTE 2: In this version of specification, each registration procedure relocates a single EEC context.

NOTE 3: Step 3 is executed when EEC determines to change its connection from S-EES to T-EES and ACR is not required.

If the EEC registration request fails after the EEC Context Pull relocation, e.g., the EES cannot reserve the necessary resources while meeting the capability requirements of the existing registered EECs, the EES shall determine the EEC Context information stale and send a failure response with a corresponding cause.

4. The EES sends a successful EEC registration response, which includes the registration ID and may include a newly assigned EEC context ID. If step 3 was executed, the EEC registration response also includes EEC context retrieval result. The EEC stores the new EEC context ID and uses it if and when it registers with another EES. The EES may also provide an expiration time to indicate to the EEC when the registration will automatically expire. To maintain the registration, the EEC shall send a registration update request prior to the expiration. If a registration update request is not received prior to the expiration time, the EES shall treat the EEC as implicitly de-registered.

If the EEC context relocation status indicates that the EEC context relocation was not successful, then the EEC performs the required EDGE-1 subscriptions at the T-EES.

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

##### 8.4.2.3.2 EEC registration request

Table 8.4.2.3.2-1 describes information elements in the EEC registration request from the EEC to the EES.

Table 8.4.2.3.2-1: EEC registration request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| EECID | M | Unique identifier of the EEC. |
| UE Identifier | O | The identifier of the hosting UE (i.e. GPSI or identity token) |
| Security credentials | M | Security credentials resulting from a successful authorization for the edge computing service. |
| AC Profile(s) | O | Profiles of ACs for which the EEC provides edge enabling services. AC Profiles are further described in Table 8.2.2-1. |
| EEC Service Continuity Support | O | Indicates if the EEC supports service continuity or not. The IE also indicates which ACR scenarios are supported by the EEC. |
| Proposed expiration time | O | Proposed expiration time for the registration. |
| EEC context ID (NOTE) | O | Identifier of the EEC context obtained from a previous registration. |
| Source EESID (NOTE) | O | Identifier of the EES that provided EEC context ID. |
| Source EES Endpoint (NOTE) | O | The endpoint address (e.g. URI, IP address) of the EES that provided EEC context ID. |
| NOTE: This IE shall not be present when EEC registration is performed as part of ACR. | | |

##### 8.4.2.3.3 EEC registration response

Table 8.4.2.3.3-1 describes information elements in the EEC registration response from the EES to the EEC.

Table 8.4.2.3.3-1: EEC registration response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Successful response | O | Indicates that the registration request was successful. |
| > Registration ID | M | Identifier of the EEC registration. |
| > Expiration time | M | Indicates the expiration time of the registration. To maintain an active registration status, a registration update is required before the expiration time. |
| > EEC context ID | O | Identifier of the EEC Context information available at the EES that performed the registration. |
| > EEC Context Relocation status | O | Indicates whether the EEC context retrieval from the S-EES was successful or not. |
| Failure response | O | Indicates that the registration request failed. |
| > Cause | M | Provides the cause for registration request failure. |

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

### 8.8.2 Scenarios

#### 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.

Editor's note: whether the scenarios are overlapping and how to solve any co-existence issues are FFS.

#### 8.8.2.2 Initiation by EEC using regular EAS Discovery

This procedure handles ACR as a result of the UE moving to, or the UE expecting to move to, a new location which is outside the service area of the serving EAS. It further relies on the EEC being triggered as a result of the UE's movement.

This procedure is based on Service Provisioning (as specified in clause 8.3) and EAS Discovery (as specified in clause 8.5) procedures to discover the T-EESs and EASs that shall serve the ACs as a result of the UE's new location, and that shall receive the Application Context from the serving EASs.

The procedure in the following clause describes the relocation of a single application context to a new EAS. It should be repeated for each active AC in the UE.

This procedure relies on an interface between the EEC and ACs over EDGE-5, which is out of the scope of this specification.

Pre-conditions:

1. The AC in the UE already has a connection to a corresponding S-EAS;

2. The preconditions listed in clause 8.3.3.2.2 with regards to the EEC are fulfilled; and

3. The EEC is triggered when it obtains the UE's new location or is triggered by another entity such as an ECS notification.

NOTE 1: This procedure is applicable only for Edge-aware ACs and EASs.



Figure 8.8.2.2-1: ACR initiated by the EEC and ACs

Phase I: ACR Detection

1. The EEC detects the UE location update as a result of a UE mobility event and is provided with the UE's new location as described in clause 8.8.1. The EEC can also detect an expected or predicted UE location in the future as described in clause 8.8.1.

NOTE 2: If the EEC is triggered by an external entity such as by a notification from the ECS, a list of new EESs (to be used as T-EESs) is provided by that notification and step 3 below is skipped.

Phase II: ACR Decision

2. Either the AC or the EEC makes the decision to perform the ACR.

NOTE 3: Which applications require ACR can be decided based on the application profile, e.g. requirement of service continuity of the application.

Phase III: ACR Execution

3. The EEC performs Service Provisioning (as specified in clause 8.3) for all active applications that require ACR. Since the location of the UE has changed, this procedure results in a list of T-EESs that are relevant to the supplied applications and the new location of the UE. When in step 1 the ACR for service continuity planning is triggered, then the Connectivity information and UE Location in the Service Provisioning (as specified in clause 8.3) procedure contains the expected Connectivity information and expected UE Location.

NOTE 4: If the change in UE's location does not trigger a need to change the serving EAS, the subsequent steps will not take place. The EEC remains connected to the serving EESs and the ACs remain connected to their corresponding serving EASs.

4. The EEC performs EAS discovery (as specified in clause 8.5) for the desired T-EASs by querying the T-EESs that were established in step 2 (or provided in the notification from the ECS – if it was the trigger). If EEC registration configuration for the EESs established in step 2 indicates that EEC registration is required, the EEC performs EEC registration with the EESs (as specified in clause 8.4.2.2.2) before sending the EAS discovery request.

5. The AC and EEC select the T-EAS to be used for the application traffic, as described in clause 8.5.1 EAS discovery. Step 5 is skipped if EEC selects only one T-EAS.

NOTE 5: Several EEC registrations with different EESs may result from T-EAS discovery process during a single ACR operation.

6. The EEC performs ACR launching procedure (as described in clause 8.8.3.4) to the S-EES with the ACR action indicating ACR initiation and the corresponding ACR initiation data (without the need to notify the EAS). The S-EES may apply the AF traffic influence with the N6 routing information of the T-EAS in the 3GPP Core Network (if applicable), as described in clause 8.8.3.4.

7. If the T-EES is different than the S-EES and the EEC Context at the S-EES is not stale, the S-EES initiates EEC Context Push relocation with the T-EES as described in clause 8.9.2.3. Otherwise, if the T-EES is the same as the S-EES, EEC Context Push relocation is skipped.

8. The AC is triggered by the EEC to start ACT. The AC decides to initiate the transfer of application context from the S-EAS to the T-EAS. There may be different ways of transferring context and they are all outside the scope of this specification.

When in step 1 the ACR for service continuity planning has been triggered, the AC connects to the T-EAS when the UE moves to the predicted location. Otherwise, the rest of this step is skipped.

After the ACT is completed, the AC remains connected to the T-EAS and disconnects from the S-EAS; the EEC is informed of the completion.

NOTE 6: Whether and how the AC initiates the ACT is out of scope of the present document

When in step 1 the ACR has been triggered for service continuity planning, if the UE does not move to the expected/predicted the EEC does not connect to T-EES, the AC does not connect to the T-EAS. Step 8 is skipped.

NOTE 7: The S-EAS or T-EAS can further decide to terminate the ACR, and the T-EAS can discard the application context based on information received from EEL and/or other methods (e.g. monitoring the location of the UE). It is up to the implementation of the S-EAS and T-EAS whether and how to make such a decision.

NOTE 8: It is out of scope of this specification how the AC informs the source and T-EAS that state transfer was part of service continuity planning. When in step 1 the ACR for service continuity planning is triggered, step 8 is performed after the UE moves to the predicted location.

Phase IV: Post-ACR Clean up

9. The S-EAS sends the ACR status update message to the S-EES as specified in clause 8.8.3.x.

10. The T-EAS sends the ACR status update message to the T-EES as specified in clause 8.8.3.x. If the status indicates a successful ACT, and that the EEC Context relocation procedure was attempted but failed, then the T-EES indicates the failure to the T-EAS with the ACR status update response.

NOTE 9: If the EDGE-3 subscription initialization result indicates failure, then the EAS can perform the required EDGE-3 subscriptions at the T-EES.

NOTE 10: Steps 9 and 10 can occur in any order.

11. If the status in step 9 indicates a successful ACT, the S-EES sends the ACR information notification (ACR complete) message to the EEC to confirm that the ACR has completed as specified in clause 8.8.3.5.3. If the EEC Context relocation procedure was attempted, then the notification includes EEC context relocation status IE, indicating the result of the EEC context relocation procedure. If the EEC context relocation status indicates that the EEC context relocation was not successful, then the EEC may perform the required EDGE-1 operations such as create subscriptions at the T-EES.

#### 8.8.2.3 EEC executed ACR via S-EES

Figure 8.8.2.3-1 illustrates the procedure for the EEC to execute the ACR via S-EES.

Pre-condition:

1. The AC at the UE already has a connection to the S-EAS; and

2. The EEC is able to communicate with the S-EES.



Figure 8.8.2.3-1: EEC executed ACR procedure

Phase I: ACR Detection

1. The EEC detects that ACR may be required as described in clause 8.8.1. The EEC may detect that ACR may be required for an expected or predicted UE location in the future as described in clause 8.8.1.

Phase II: ACR Decision

2. The EEC decides to proceed required procedures for triggering ACR.

Phase III: ACR Execution

3. The EEC determines the T-EES by using the provisioned information or performing service provisioning procedure per clause 8.3 of the present document. When in step 1 the ACR for service continuity planning is triggered, then the Connectivity information and UE Location in the Service Provisioning (as specified in clause 8.3) procedure contains the expected Connectivity information and expected UE Location. If the UE is within the service area of the T-EES, upon selecting T-EES the UE may need to establish a new PDU connection to the target EDN. If EEC registration configuration for the T-EES indicates that EEC registration is required, the EEC performs EEC registration with the selected T-EES as specified in clause 8.4.2.2.2. The EEC can then discover and select T-EAS by performing EAS Discovery with the T-EES per clause 8.5.2 of the present document.

NOTE 1: Several EEC registrations with different EESs may result from T-EAS discovery process during a single ACR operation.

4. The EEC performs ACR launching procedure (as described in clause 8.8.3.4) to the S-EES with the ACR action indicating ACR initiation and the corresponding ACR initiation data (with the need to notify the EAS). The S-EES authorises the request from the EEC. The S-EES decides to execute ACR based on the information received from the EEC, EEC context and/or EAS profile. The S-EES may apply the AF traffic influence with the N6 routing information of the T-EAS in the 3GPP Core Network (if applicable) and sends the ACR Notify message to the S-EAS to initiate ACT between the S-EAS and the T-EAS. The EEC also subscribes to receive ACR information notifications for ACR complete events from the S-EES, as described in clause 8.8.3.5.2.

5. If the T-EES is different than the S-EES and the EEC Context at the S-EES is not stale, the S-EES initiates EEC Context Push relocation with the T-EES as described in clause 8.9.2.3. Otherwise, if the T-EES is the same as the S-EES, EEC Context Push relocation is skipped.

6. The S-EAS transfers the application context to the T-EAS at implementation specific time. This process is out of scope of the present specification.

When in step 1 the ACR has been triggered for service continuity planning, if the UE does not move to the predicted location, the EEC does not connect to T-EES, the AC does not connect to the T-EAS. Post-ACR Clean up is skipped.

NOTE 2: The S-EAS or T-EAS can further decide to terminate the ACR, and the T-EAS can discard the application context based on information received from EEL and/or other methods (e.g. monitoring the location of the UE). It is up to the implementation of the S-EAS and T-EAS whether and how to make such a decision.

NOTE 3: When in step 1 the ACR for service continuity planning is triggered, Post-ACR Clean up is performed after the UE moves to the predicted location.

Phase IV: Post-ACR Clean up

7. The S-EAS sends the ACR status update message to the S-EES as specified in clause 8.8.3.x.

8. The T-EAS sends the ACR status update message to the T-EES as specified in clause 8.8.3.x. If the status indicates a successful ACT, and that the EEC Context relocation procedure was attempted but failed, then the T-EES indicates the failure to the T-EAS with the ACR status update response.

NOTE 4: If the EDGE-3 subscription initialization result indicates failure, then the EAS can perform the required EDGE-3 subscriptions at the T-EES.

NOTE 5: Steps 7 and 8 can occur in any order.

9. If the status in step 7 indicates a successful ACT, the S-EES sends the ACR information notification (ACR complete) message to the EEC to confirm that the ACR has completed as specified in clause 8.8.3.5.3. If the EEC Context relocation procedure was attempted, then the notification includes EEC context relocation status IE, indicating the result of the EEC context relocation procedure. If the EEC context relocation status indicates that the EEC context relocation was not successful, then the EEC may perform the required EDGE-1 operations such as create subscriptions at the T-EES.

#### 8.8.2.4 S-EAS decided ACR scenario

The procedure in this clause illustrates the scenario for S-EAS decided ACR.

In this procedure, the S-EAS may detect the need of ACR locally or is notified by the S-EES via ACR management notifications for "ACR monitoring" events. The S-EAS make the decision about whether to perform the ACR, and starts the ACR at a proper time.

Pre-conditions:

1. The S-EAS may depend on the receipt of certain User plane path management events from the S-EES, e.g. "user plane path change" events or "ACR monitoring" events, to detect the need for an ACR. For the following procedure it is assumed that the S-EAS has subscribed to continuously receive the respective events from the S-EES; and

2. The EEC has subscribed to receive ACR information notifications for target information notification events and ACR complete events from the S-EES, as described in clause 8.8.3.5.2.



Figure 8.8.2.4-1: S-EAS decided ACR scenario

The S-EAS decided ACR scenario is outlined with four main phases: detection, decision, execution and clean up.

Phase I: ACR Detection

1. The S-EAS either receives ACR management notifications from source Edge Enabler Sever indicating that ACR may be required ("ACR monitoring" event), or self detects the need for ACR (e.g. upon receipt of a "user plane path change" event). If the ACR management notification indicates "ACR monitoring" event, then the notification will also contain the T-EAS information (see clause 8.6.3.2.3). The S-EAS may detect that ACR may be required for an expected or predicted UE location in the future as described in clause 8.8.1.

NOTE 1: How the S-EAS self detects the local need for ACR is outside the scope of this specification.

Phase II: ACR Decision

2. The S-EAS makes the decision to perform the ACR

NOTE 2: How the S-EAS determines when to start the ACR is outside the scope of this specification.

Phase III: ACR Execution

3. The S-EAS discovers the T-EAS as described in clause 8.8.3.2. When in step 1 the ACR has been triggered for service continuity planning, then UE Location and Target DNAI values in the Retrieve T-EES procedure contain the expected UE Location and expected Target DNAI. After S-EAS determines the T-EAS to use, the S-EAS may apply the AF traffic influence with the N6 routing information of the T-EAS in the 3GPP Core Network (if applicable).

4. The S-EAS sends selected T-EAS declaration message to S-EES, to inform S-EES the determined T-EAS to use as described in clause 8.8.3.7.

5. If the T-EES is different than the S-EES and the EEC Context at the S-EES is not stale, the S-EES initiates EEC Context Push relocation with the T-EES as described in clause 8.9.2.3. Otherwise, if the T-EES is the same as the S-EES, EEC Context Push relocation is skipped.

6. Based on the T-EAS selection information received from the S-EAS, the S-EES sends the target information notification to the EEC as described in clause 8.8.3.5.3.

7. The S-EAS transfers the application context to the T-EAS selected in step 3. This process is out of scope of the present specification.

When in step 1 the ACR has been triggered for service continuity planning, if the UE does not move to the predicted location, the EEC does not connect to T-EES, the AC does not connect to the T-EAS. Post-ACR Clean up is skipped.

NOTE 3: The S-EAS or T-EAS can further decide to terminate the ACR, and the T-EAS can discard the application context based on information received from EEL and/or other methods (e.g. monitoring the location of the UE). It is up to the implementation of the S-EAS and T-EAS whether and how to make such a decision.

NOTE 4: When in step 1 the ACR has been triggered for service continuity planning, Post-ACR Clean up is performed after the UE moves to the expected location.

Phase IV: Post-ACR clean up

8. The S-EAS sends the ACR status update message to the S-EES as specified in clause 8.8.3.x.

9. The T-EAS sends the ACR status update message to the T-EES as specified in clause 8.8.3.x. If the status indicates a successful ACT, and that the EEC Context relocation procedure was attempted but failed, then the T-EES indicates the failure to the T-EAS with the ACR status update response.

NOTE 5: If the EDGE-3 subscription initialization result indicates failure, then the EAS can perform the required EDGE-3 subscriptions at the T-EES.

NOTE 6: Steps 8 and 9 can occur in any order.

10. If the status in step 8 indicates a successful ACT, the S-EES sends the ACR information notification (ACR complete) message to the EEC to confirm that the ACR has completed as specified in clause 8.8.3.5.3. If the EEC Context relocation procedure was attempted, then the notification includes EEC context relocation status IE, indicating the result of the EEC context relocation procedure. If the EEC context relocation status indicates that the EEC context relocation was not successful, then the EEC may perform the required EDGE-1 operations such as create subscriptions at the T-EES.

#### 8.8.2.5 S-EES executed ACR

Figure 8.8.2.5-1 illustrates the procedure for the S-EES to detect, decide and execute the ACR from the S-EAS to the T-EAS. This procedure may support automated ACR by S-EES when initiated by S-EAS as per clause 8.8.3.6.

Editor's note: Usage of network path information for the scenarios in clause 8.8.2.5 is FFS.

Pre-condition:

1. The AC at the UE already has a connection to the S-EAS;

2. The EEC is able to communicate with the S-EES;

3. The EEC has subscribed to receive ACR information notifications for target information notification events and ACR complete events from the S-EES, as described in clause 8.8.3.5.2;

4. The S-EAS optionally subscribed to receive ACR management notifications for "ACR facilitation" events to the S-EES, in order to enable detection at S-EAS.

5. In case of EELManagedACR, the T-EAS has subscribed to receive ACT status notifications as described in clause 8.8.3.6.2.3.



Figure 8.8.2.5-1: S-EES executed ACR procedure

1. The S-EAS may initiate Automated ACR with S-EES as specified in clause 8.8.3.6. In this step, the S-EAS and S-EES negotiate an address of the Application Context storage to S-EES. The S-EAS puts the Application Context at this address which can be further accessed by the S-EES when the ACT is required.

In this case, the S-EES executes steps 2 (i.e., S-EES detection), 4, 5, 6, 7, 8, 9, 10, 11, 13 and 14. Rest of steps are skipped.

Phase I: ACR Detection

2. Detection entities (S-EAS, S-EES, EEC) detect that ACR may be required as described in clause 8.8.1. The detection by the S-EES may be triggered by the User Plane path change notification received from the 3GPP Core Network due to S-EAS request for "ACR facilitation" event (see clause 8.6.3) or due to step 1.

The detection entity may detect that ACR may be required for an expected or predicted UE location in the future as described in clause 8.8.1.

Phase II: ACR Decision

3. The detection entity performs ACR launching procedure (as described in clause 8.8.3.4) with the ACR action indicating ACR determination and the corresponding ACR determination data.

4. The S-EES authorises the message if received. The S-EES decides to execute ACR based on the information received or local detection, and the information of EEC context or EAS profile, and then proceed the below steps.

Phase III: ACR Execution

5. The S-EES determines T-EES and T-EAS via the Discover T-EAS procedure in clause 8.8.3.2 of the present document. When in step 2 the ACR has been triggered for service continuity planning, then UE Location and Target DNAI values provided in the Retrieve T-EES procedure contain the expected UE Location and expected Target DNAI. The S-EES may decide not to perform ACR if T-EAS is not available.

6. If the T-EES is different than the S-EES and the EEC Context at the S-EES is not stale, the S-EES initiates EEC Context Push relocation with the T-EES as described in clause 8.9.2.3. Otherwise, if the T-EES is the same as the S-EES, EEC Context Push relocation is skipped.

7. The S-EES sends the target information notification to the EEC as described in clause 8.8.3.5.3.

8. The S-EES may apply the AF traffic influence with the N6 routing information of the T-EAS in the 3GPP Core Network (if applicable).

9. The S-EES sends the ACR Notify message (e.g. as notification for "ACR facilitation" event or due to step 1) to the S-EAS to initiate ACT between the S-EAS and the T-EAS.

10. The Application Context is transferred from S-EAS to the T-EAS at implementation specific time. In the case of automated ACR, the S-EES accesses the Application Context from the address as per step 1 and the S-EES and T-EES engage in the ACT from S-EAS to the T-EAS (obtained as per step 5) in a secure way. Further the T-EAS accesses the Application Context made available by the T-EES. If S-EAS performs the ACT directly with T-EAS, the specification of such process is out of scope of the present document.

NOTE 1: The Application Context is encrypted and protected by the application layer. The S-EES and the T-EES engage in the packet level transport of the Application Context and they have no visibility to the content of the Application Context.

When in step 2 the ACR has been triggered for service continuity planning, if the UE does not move to the predicted location, the EEC does not connect to T-EES, the AC does not connect to the T-EAS. Post-ACR Clean up is skipped.

NOTE 2: The S-EAS or T-EAS can further decide to terminate the ACR, and the T-EAS can discard the application context based on information received from EEL and/or other methods (e.g. monitoring the location of the UE). It is up to the implementation of the S-EAS and T-EAS whether and how to make such a decision.

NOTE 3: When in step 2 the ACR has been triggered for service continuity planning, Post-ACR Clean up is performed after the UE moves to the expected location.

Phase IV: Post-ACR Clean up

11. In case of EELManagedACR, once the ACT is successful, the T-EES sends an ACT status notification to the T-EAS as described in clause 8.8.3.6.2.4, indicating that the Application Context is available.

12. The S-EAS sends the ACT status update message to the S-EES as specified in clause 8.8.3.x.

13. The T-EAS sends the ACR status update message to the T-EES as specified in clause 8.8.3.x. If the status indicates a successful ACT, and that the EEC Context relocation procedure was attempted but failed, then the T-EES indicates the failure to the T-EAS with the ACR status update response.

NOTE 4: If the EDGE-3 subscription initialization result indicates failure, then the EAS can perform the required EDGE-3 subscriptions at the T-EES.

NOTE 5: Steps 12 and 13 can occur in any order.

14. If the status in step 12 indicates a successful ACT, the S-EES sends the ACR information notification (ACR complete) message to the EEC to confirm that the ACR has completed as specified in clause 8.8.3.5.3. If the EEC Context relocation procedure was attempted, then the notification includes EEC context relocation status IE, indicating the result of the EEC context relocation procedure. If the EEC context relocation status indicates that the EEC context relocation was not successful, then the EEC may perform the required EDGE-1 operations such as create subscriptions at the T-EES.

NOTE 6: The Application Client mechanism to support switchover of the application traffic to T-EAS is out of scope of the specification.

#### 8.8.2.6 EEC executed ACR via T-EES

Figure 8.8.2.6-1 illustrates the procedure for the EEC to execute the ACR via T-EES.

Pre-condition:

1. The EEC has the S-EAS information that serves the AC.



Figure 8.8.2.6-1: EEC executed ACR via T-EES

Phase I: ACR Detection

1. The EEC detects that ACR may be required as described in clause 8.8.1. The EEC may detect that ACR may be required for an expected or predicted UE location in the future as described in clause 8.8.1.

Phase II: ACR Decision

2. The EEC decides to proceed with required procedures for ACR.

NOTE 1: If supported, the AC can be involved in the decision. It is out of scope of the present document how the AC is involved.

Phase III: ACR Execution

3. The EEC determines the T-EES by using the provisioned information or performing service provisioning procedure per clause 8.3. When in step 1 the ACR for service continuity planning is triggered, then the Connectivity information and UE Location used in the service provisioning procedure contain the expected Connectivity information and expected UE Location. If the UE is within the service area of the T-EES, upon selecting the T-EES the UE may need to establish a new PDU connection to the target EDN. If EEC registration configuration for the T-EES indicates that EEC registration is required, the EEC performs registration with the selected T-EES as specified in clause 8.4.2.2.2. The EEC performs EAS Discovery with the T-EES per clause 8.5.2.

NOTE 2: Several EEC registrations with different EESs may result from T-EAS discovery process during a single ACR operation.

4. The EEC performs ACR launching procedure (as described in clause 8.8.3.4) to the T-EES with the ACR action indicating ACR initiation and the corresponding ACR initiation data (with the need to notify the EAS). If the received ACR initiation request contains an EEC context ID and the S-EES Endpoint, the T-EES performs an EEC Context Pull relocation (clause 8.9.2.2). The T-EES may apply the AF traffic influence with the N6 routing information of the T-EAS in the 3GPP Core Network (if applicable). Then the T-EES sends the ACR Notify message to the T-EAS. The EEC also subscribes to receive ACR information notifications for ACR complete events from the T-EES, as described in clause 8.8.3.5.2.

5. The T-EAS initiates ACT between the S-EAS and the T-EAS. This process is out of scope of the present specification.

When in step 1 the ACR has been triggered for service continuity planning, if the UE does not move to the predicted location the EEC does not connect to T-EES, the AC does not connect to the T-EAS. Post-ACR Clean up is skipped.

NOTE 3: The S-EAS or T-EAS can further decide to terminate the ACR, and the T-EAS can discard the application context based on information received from EEL and/or other methods (e.g. monitoring the location of the UE). It is up to the implementation of the S-EAS and T-EAS whether and how to make such a decision.

NOTE 4: When in step 1 the ACR has been triggered for service continuity planning, Post-ACR Clean up is performed after the UE moves to the expected location.

Phase IV: Post-ACR clean up

6. The T-EAS sends the ACR status update message to the T-EES as specified in clause 8.8.3.x. If the status indicates a successful ACT, and that the EEC Context relocation procedure was attempted but failed, then the T-EES indicates the failure to the T-EAS with the ACR status update response.

NOTE 5: If the EDGE-3 subscription initialization result indicates failure, then the EAS can perform the required EDGE-3 subscriptions at the T-EES.

7. The T-EES sends the ACR information notification (ACR complete) message to the EEC as described in clause 8.8.3.5.3. If the EEC Context relocation procedure was attempted, then the notification includes EEC context relocation status IE, indicating the result of the EEC context relocation procedure. If the EEC context relocation status indicates that the EEC context relocation was not successful, then the EEC may perform the required EDGE-1 operations such as create subscriptions at the T-EES.

If the procedure fails after step 4, it will be terminated with an appropriate cause in the ACR information notification to the EEC in step 7. The EEC may then proceed attempting to obtain services from the T-EAS discovered in step 3 without service continuity support. Alternatively, the EEC may resume the present procedure starting with step 3 and selecting a different T-EES.

NOTE 6: The support of ACR between EDNs operated by different ECSPs is dependent on business agreement between the ECSPs.

Editor's note: When the procedure fails, the use of other mechanisms to alleviate this failure is FFS.

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

#### 8.8.3.6 Automated ACR procedure

##### 8.8.3.6.1 General

This clause introduces a procedure for ACR performed by the Edge Enabler Servers.

When S-EES receives a request for automated ACR from S-EAS, the S-EES performs the service operations for the service continuity including detecting the event which may trigger the ACR, making the ACR decision, discovering the T-EAS, accessing and transferring the Application Context to the T-EES/T-EAS, notifying the T-EAS about the available Application Context, notifying the 3GPP network about ACR information, notifying the EEC about the T-EAS information (as per EEC subscription).

The automated ACR procedure is designed as an asynchronous operation wherein the S-EES will generate notifications (e.g. failure of any ACR related operation) to the S-EAS while performing the ACR operations.

##### 8.8.3.6.2 Procedure

###### 8.8.3.6.2.1 General

This clause describes the procedures for S-EAS to request for EELManagedACR and for T-EAS to subscribe for ACT status notification.

###### 8.8.3.6.2.2 ACR request

Figure 8.8.3.6.2.2-1 illustrates the procedure for automated ACR performed by the Edge Enabler Servers.

Pre-conditions:

1. Information related to the S-EES is available with the S-EAS.

2. The T-EAS has subscribed to the ACR related event from the T-EES.

3. The EEC has subscribed to the ACR related event from the S-EES.



Figure 8.8.3.6.2.2-1: ACR procedure

1. The S-EAS sends an automated ACR service request (UE identifier, EAS characteristics for ACR) to request the S-EES to handle all the service operations of the ACR. The S-EAS may initiate this request with S-EES based on different triggers (e.g. when Application Client is connecting to the S-EAS). An address for accessing the Application Context may be provided if available, which allows the S-EES to access the Application Context generated by the S-EAS for ACT.

2. The S-EES checks whether the requesting EAS is authorized to perform the operation. If it is authorized, the S-EES responds with an automated ACR service response. If no address for accessing Application Context is provided by S-EAS in step 1, then the S-EES provides an address for storing the Application Context by S-EAS.

NOTE: How the EES accesses the Application Context related to the EAS from the address of the Application Context storage is up to implementation and outside the scope of the present document.

3. The S-EES determines the automated ACR operations to be executed as specified in clause 8.8.2.5.

###### 8.8.3.6.2.3 ACT status subscription

Figure 8.8.3.6.2.3-1 illustrates the procedure for T-EAS to subscribe for ACT status during EELManagedACR.



Figure 8.8.3.6.2.3-1: ACR procedure

1. The T-EAS sends an ACT status subscription request to the T-EAS.

2. The T-EES checks whether the requesting T-EAS is authorized to perform the operation. If it is authorized, the T-EES creates the subscription.

3. The T-EES responds with the ACT status subscription response

###### 8.8.3.6.2.4 ACT status notification

Figure 8.8.3.6.2.4-1 illustrates the procedure for T-EES to notify the T-EAS about the status of ACT during EELManagedACR.

Pre-conditions:

1. ACT between the S-EES and T-EES has competed.



Figure 8.8.3.6.2.2-1: ACR procedure

1. The S-EES sends ACT status notification to the Target EAS, notifying about the status of the ACT between the Application Context received from the S-EES.

2. On receiving a notification about successful ACT, the T-EAS may initiate the ACR status update procedure as described in clause 8.8.3.x.

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

#### 8.8.3.x ACR status update procedure

Figure 8.8.3.x-1 illustrates the procedure for ACR status update, which is triggered by the S-EAS or the T-EAS. In the post-ACR clean up phase of service continuity scenarios described in clause 8.8.2, this procedure may be used by EAS to indicate the status of ACT to their registrar EESs; or used by the T-EAS to update the notification target address and allow the T-EES to indicate the status of EDGE-3 subscription relocation to the T-EAS including subscription ID update for EDGE-3 subscriptions; or both.

Pre-condition:

1. The ACT procedure between the S-EAS and the T-EAS is either successfully completed or failed.



Figure 8.8.3.x-1: ACR status update procedure

1. The EAS sends ACR status update request message to the EES, the request may include the ACT result (success or failure). When sent by the T-EAS, the request may include a list of EDGE-3 subscription ID(s) and Notification Target Address for which the T-EAS wants to update. In case of EELManagedACR, the ACT result is not included by the T-EAS.

2. If the request is authorized by the EES, the EES processes the request. When sent by the T-EAS, if the EDGE-3 subscriptions are available in the T-EES or were successfully relocated during the EEC context relocation procedure, the T-EES updates the Notification Target Address if provided by the T-EAS and may update the list of EDGE-3 subscription ID(s) for the EDGE-3 subscriptions.

3. The EES responds with ACR status update response message to the EAS.

NOTE: If EES is not changed during ACR, the T-EES and S-EES are the same server.

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

#### 8.8.4.4 ACR request

Table 8.8.4.4-1 describes information elements for the ACR request sent from the EEC either to the S-EES or T-EES.

Table 8.8.4.4-1: ACR request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Requestor Identifier | M | Unique identifier of the requestor (i.e. EECID or EASID). |
| Security credentials | M | Security credentials resulting from a successful authorization for the edge computing service. |
| EASID | O | Identifier of the EAS |
| UE identifier (NOTE 4) | O | The identifier of the UE (i.e. GPSI). |
| ACR action (NOTE 3) | M | Indicates the ACR action (ACR initiation or ACR determination) |
| ACR initiation data (NOTE 2) | O | ACR initiation IEs to be included in an ACR request message when ACR action indicates it is ACR initiation request. |
| > T-EAS Endpoint | M | Endpoint information (e.g. URI, FQDN, IP 3-tuple) of the T-EAS. |
| > DNAI of the T-EAS | O | DNAI information associated with the T-EAS. |
| > N6 Traffic Routing requirements | O | The N6 traffic routing information and/or routing profile ID corresponding to the T-EAS DNAI. |
| > EAS notification indication | M | Indicates whether to notify the EAS about the need of ACR. |
| > S-EAS endpoint (NOTE 1) | O | Endpoint information of the S-EAS |
| ACR determination data (NOTE 2) | O | ACR determination IEs to be included in an ACR request message when ACR action indicates it is ACR determination request. |
| > S-EAS endpoint | M | Endpoint information of the S-EAS |
| NOTE 1: This IE shall be present if the EAS notification indication indicates that the EAS needs to be informed.  NOTE 2: Either ACR initiation or ACR determination shall be included corresponding to the ACR action.  NOTE 3: This IE shall indicate ACR determination if the request originates from the S‑EAS.  NOTE 4: This IE shall be present if the request originates from the EEC. | | |

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

#### 8.8.4.10 ACR information notification

Table 8.8.4.10-1 describes the information elements for ACR information notification from the EES to the EEC.

Table 8.8.4.10-1: ACR information notification

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Subscription ID | M | Subscription identifier corresponding to the subscription stored in the EES for the request |
| EASID | M | The identifier of the EAS |
| Event ID | M | Either Target information notification or ACR complete |
| Target information (NOTE 1) | O | Details of the selected T-EAS and the T-EES. |
| > T-EAS information | M | Details of the selected T-EAS as described in 'Discovered EAS' IE of Table 8.5.3.3-1. |
| > T-EES information (NOTE 4) | O | Details of the selected T-EES as described in 'EDN configuration information' IE of Table 8.3.3.3.3-1. |
| Result of ACR (NOTE 2) | O | Indicates whether the ACR is successful or failure |
| EEC Context Relocation status (NOTE 5) | O | Indicates whether the EEC context relocation was successful or not. |
| Cause information (NOTE 3) | O | Indicates the cause information for the failure |
| NOTE 1: This IE shall be included when Event ID indicates 'Target information notification' event  NOTE 2: This IE shall be included when Event ID indicates 'ACR complete' event  NOTE 3: This IE shall be included when the Result of ACR indicates failure.  NOTE 4: This IE shall be included if the selected T-EES is different from the S-EES. Otherwise, it may be skipped.  NOTE 5: This IE shall be included when Event ID indicates 'ACR complete' event and EEC context relocation was attempted. | | |

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

#### 8.8.4.x ACR status update request

Table 8.8.4.x-1 describes the information elements for the ACR status update request from EAS to EES.

Table 8.8.4.x-1: ACR status update request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| EASID | M | The identifier of the EAS providing the update |
| Security credentials | M | Security credentials of the EAS |
| ACT result (NOTE 1) | O | Indicates whether the ACT was successful or failed. |
| List of EDGE-3 subscription ID(s) (NOTE 2) | O | A list of the EDGE-3 subscription identifiers. |
| Notification Target Address for EDGE-3 subscription (NOTE 2) | O | Notification Target Address of the EAS where the notification is to be sent by the EES for EDGE-3 subscription. |
| NOTE 1: This IE may be included by the S-EAS and T-EAS. In case of EELManagedACR, this IE is not included by the T-EAS.  NOTE 2: This IE may be included only by the T-EAS. | | |

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

#### 8.8.4.y ACR status update response

Table 8.8.4.y-1 describes the information elements for the ACR status update response from EES to EAS.

Table 8.8.4.y-1: ACR status update response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Successful response | O | Indicates that the request was successful. |
| > EDGE-3 subscription initialization result | O | The IE indicates if the EDGE-3 subscriptions were initialized successfully or if initialization failed. |
| > List of updated EDGE-3 subscription ID(s) | O | If the EDGE-3 subscription initialization result is successful, the EES provides the updated subscription identifier(s). The absence of an identifier implies no change for the subscription identifier. |
| Failure response | O | Indicates that the request failed |
| > Cause | O | Indicates the cause of request failure |

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

#### 8.8.4.a ACT status subscription request

Table 8.8.4.x-1 describes the information elements for the ACT status subscription request from EAS to EES.

Table 8.8.4.a-1: ACT status subscription request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| EASID | M | The identifier of the EAS providing the update |
| Security credentials | M | Security credentials of the EAS |
| Notification Target Address | M | Notification Target Address of the EAS where the notification is to be sent by the EES |

#### 8.8.4.b ACT status subscription response

Table 8.8.4.b-1 describes the information elements for the ACT status subscription response from EES to EAS.

Table 8.8.4.b-1: ACT status subscription response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Successful response | O | Indicates that the request was successful. |
| > Subscription ID | O | Identifier of the subscription |
| Failure response | O | Indicates that the request failed |
| > Cause | O | Indicates the cause of request failure |

#### 8.8.4.c ACT status notification

Table 8.8.4.c-1 describes the information elements for an ACT status notification from the EES to the EAS.

Table 8.8.4.c-1: ACT status notification

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Subscription ID | M | Subscription identifier corresponding to the subscription stored in the EES for the request |
| ACT status | M | Status of the ACT between S-EES and the T-EES |

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

#### 8.8.5.1 General

Table 8.8.5.1-1 illustrates the APIs for ACR.

Table 8.8.5.1-1: ACR APIs

|  |  |  |  |
| --- | --- | --- | --- |
| API Name | API Operations | Operation  Semantics | Consumer(s) |
| Eees\_TargetEASDiscovery | Request | Request/Response | EAS, EES |
| Eees\_SelectedTargetEAS | Declare | Request/Response | EAS |
| Eecs\_TargetEESDiscovery | Request | Request/Response | EES |
| Eees\_AppContextRelocation | Request | Request/Response | EEC, EAS |
| Eees\_ACREvents | Subscribe | Subscribe/Notify | EEC |
| Notify |
| UpdateSubscription |
| Unsubscribe |
| Eees\_AutomatedACR | Request | Request/Response | EAS |
| Subscribe | Subscribe/Notify | EAS |
| Notify |
| Eees\_ACRStatusUpdate | Request | Request/Response | EAS |

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

#### 8.8.5.6 Eees\_AutomatedACR API

Editor's note: Currently there is no unanimity on the usage of the term "AutomatedACR" and identifying a suitable term to replace the term "AutomatedACR" is FFS.

##### 8.8.5.6.1 General

This clause describes the Eees\_AutomatedACR API and its operations.

##### 8.8.5.6.2 Eees\_AutomatedACR\_Request operation

**API operation name:** Eees\_AutomatedACR\_Request

**Description:** The consumer requests for the automated ACR handling by the Edge Enabler Server. To use this API, the ASP (EAS provider) and ECSP should have an agreement to use a shared Application Context storage which enables the EES to undertake the ACT in a transparent and secure way, maintaining end user privacy.

**Inputs:** See clause 8.8.4.15.

**Outputs:** See clause 8.8.4.16*.*

See clause 8.8.3.6.2.2 for details of usage of this operation.

##### 8.8.5.6.3 Eees\_EELManagedACR\_Subscribe operation

**API operation name:** Eees\_EELManagedACR\_Subscribe

**Description:** The consumer requests for the ACT status notifications for EELManagedACR.

**Inputs:** See clause 8.8.4.a.

**Outputs:** See clause 8.8.4.b*.*

See clause 8.8.3.6.2.3 for details of usage of this operation.

##### 8.8.5.6.4 Eees\_EELManagedACR\_Notify operation

**API operation name:** Eees\_EELManagedACR\_Subscribe

**Description:** The consumer is notified about the ACT status for EELManagedACR.

**Inputs:** See clause 8.8.4.c.

See clause 8.8.3.6.2.4 for details of usage of this operation.

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

#### 8.8.5.x Eees\_ACRStatusUpdate API

##### 8.8.5.x.1 General

This clause describes the Eees\_ACRStatusUpdate API and its operations.

##### 8.8.5.x.2 Eees\_ACRStatusUpdate\_Request operation

**API operation name:** Eees\_ACRStatusUpdate\_Request

**Description:** The consumer updates the information related to ACR, e.g. ACT status.

**Inputs:** See clause 8.8.4.x.

**Outputs:** See clause 8.8.4.y*.*

See clause 8.8.3.x for details of usage of this operation.

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