**3GPP TSG-CT WG1 Meeting #146C1-240165**

**Online, 22– 26 January 2024**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.558** | **CR** | **0084** | **rev** | **-** | **Current version:** | **18.3.0** |  |
|  | | | | | | | | |
| *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:*** | Common EAS enhancements in ECS Service Provisioning and EAS Discovery procedures without ECS-ER. | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | CT1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | EDGEAPP\_Ph2 | | | | |  | ***Date:*** | | | 2024-01-04 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | 3GPP TS 23.558 CR#0308(see S6-232207) agreed in SA6#55, proposed Common EAS discovery feature which updates the existing ECS Service Provisioning and EAS discovery procedure.  Based on the status of CR#0074(see C1-238788) postponed in CT1#145 due to awaiting conclusion for ECS-ER entity. As a way forward this contribution address enhancements to ECS Service Provisioning and EAS discovery procedure to support Common EAS feature without ECS-ER.  TS 24.558 needs to be aligned with the above SA6 changes. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The contribution propose updates to ECS Service Provisioning and EAS discovery procedure to support Common EAS feature along with OPEN API changes.  **Backward compatibility analysis:**  This CR does not introduce any backward compatible issue. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Misalignment with the stage 2 requirement. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3.2.2.2, 6.5.3.1, 6.3.5.2.6, 6.3.5.2.8, 6.3.7, 7.2.2.2.2, 8.1.5.1, 8.1.5.2.2, 8.1.5.2.9, 8.1.5.2.X(new), 8.1.7, A.3, B.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 \* \* \* \*

##### 5.3.2.2.2 EEC requesting EAS discovery information using Eees\_EASDiscovery\_EasDiscRequest operation

To request for one-time EAS discovery, the EEC shall send an HTTP POST request to the EES as specified in clause 6.3.2.4.4. The body of the POST message shall include the EasDiscoveryReq data structure as specified in clause 6.3.5.2.2.

Upon reception of the HTTP POST message from the EEC, the EES shall:

a) process the EAS discovery request information;

b) the EES verifies and checks if the EEC is authorized to discover the requested EAS(s) from EES;

c) if EEC is authorized to discover the requested EAS(s) from EES, the EEC is not registered with the EES, and the ECSP policy requires the EEC to perform EEC registration prior to EAS discovery, the EES shall reject the request by sending an HTTP "403 Forbidden" status code to the EEC including the ProblemDetails data structure with the "cause" attribute containing the "REGISTRATION\_REQUIRED" application error;

d) if the EEC is authorized to discover the requested EAS(s) from EES and the EEC is registered as required by the ECSP policy, then the EES;

1) may obtain the UE's location as specified in clause 5.3 of 3GPP TS 29.122 [3];

2) if EAS discovery filters are provided by the EEC without the "appGroupProfile" attribute, the EES identifies the EAS(s) based on the provided EAS discovery filters and the UE location, and if the enNB1 feature is supported, the "userLocation" attribute may be provided in the "locInf" attribute within the EasDiscoveryReq data type;

3) 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. The EES identifies the EAS(s) who supports at least one of the ACR scenarios as indicated by EEC; and

i. the EES may select one EAS and determine to perform application traffic influence for this AC based on AC's service KPI or EAS(s) service KPI in desired response time, when the EES does not perform traffic influence in advance;

4) if EAS discovery filters are not provided:

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

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

5) if the EdgeApp\_2 feature is supported and if the "appGroupProfile" attribute is provided within the EasDiscoveryFilter data type, the EES determines the availability of common EAS corresponding to the "appGrpId" attribute. If the common EAS is:

i) not available, then based on the policy if the EES needs to select the common EAS, the EES shall identify an EAS matching the received "appGrpId" attribute based on the EAS discovery filters or the ECSP policy. The EES shall store the common EAS information and related "appGrpId" attribute and EES shall trigger common EAS announcement procedure as specified in clause 5.14 of 3GPP TS 29.558 [4]; and

ii) available at the EES, then the EES provides information of that EAS as part for EAS discovery response;

NOTE: The EES may have previously determined and stored the common EAS for application group ID, or the EES may have received the common EAS selection information for application group ID during the common EAS announcement procedure as specified in clause 5.14 of 3GPP TS 29.558 [4].

6) the EES may trigger the EAS management system to instantiate the EAS that matches with EAS discovery filter IEs;

7) if the EdgeApp\_2 feature is supported and the EEC indicates the EAS selection support within the "easSelSupInd" attribute, the EES shall select one matching EAS that fulfils the EEC requirements as described in bullets 2), 3) and 4), and the EES shall provide the selected EAS information to the EEC within the "discoveredEas" attribute;

e) if the EdgeApp\_2 feature is supported, and:

1) if the EEC indicates EAS Instantiation Triggering using "easIntTrigSup" attribute with the value set to true in the EAS discovery request, the EES may trigger the ECSP to instantiate the EAS that matches with EAS discovery filter IEs (e.g. ACID) and the EES supports such capability. If the "easIntTrigSup" attribute is omitted or set to value false the EES shall not trigger the ECSP to instantiate the EAS and the EES may determine instantiable EAS information using "easInstInfos" attribute, which is provided in the EAS discovery response, for EAS(s) that are instantiable but not yet instantiated and match the EAS discovery filter IEs; and

2) if the EEC indicates the predicted expiration time by which the UE reaches location using the "predictExpTime" attribute, the EES may also collect edge load analytics from the ADAES (as specified in clause 8.8.2 of 3GPP TS 23.436 [9]) or performance data from the OAM to find whether the EAS(s) satisfies the expected AC service KPIs or the minimum required AC service KPIs; and

Editor's note [CR#0053, EDGEAPP\_Ph2]: The EEC usage of the analytics information received in the EAS discovery response is FFS.

3) if the EEC indicates the UEs serving MNO information as part of the "servingPLMNInfo" attribute, the EES identifies the EAS(s) that matches the allowed MNO information in their EAS profiles and UE's serving MNO information as specified in clause 6.3.5.2.3; and

f) if the processing of the request was successful, the EES sends an EAS discovery response to the EEC as specified in clause 6.3.2.4.4.2.2, which includes information about the discovered EASs. The response shall include endpoint information for discovered EASs. 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. If the discovered EAS is registered to another EES, then the endpoint information of the EAS shall be included in the "eesEndPt" attribute within the DiscoveredEas data type.

If the successful processing of the request does not result in finding a matching EAS (i.e. there is no client side error), the EES responds with "204 No Content" HTTP status code. Otherwise, the EES shall reject the EAS discovery request and respond with an appropriate failure HTTP status code.

The EEC may cache the EAS information (e.g. EAS endpoint) for subsequent use and avoid the need to repeat this procedure. If the EEC selects an EAS which is instantiable but not yet instantiated (i.e. an EAS profile is not provided), the EEC shall send the EAS information provisioning request for EAS selection indicating the selected EAS ID. If the "lifeTime" attribute is included in the response, the EEC may cache the EAS information only for the duration specified by the Lifetime IE.

If the failure response is received for the EAS discovery request, the EEC may resend the EAS discovery request, taking into account the received failure cause. If the failure cause indicated "REGISTRATION\_REQUIRED" error in the "cause" attribute of the "ProblemDetails" structure, the EEC shall perform an EEC registration as specified in clause 5.2.2.2.2 before resending the EAS discovery request.

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

#### 6.3.5.1 General

This clause specifies the application data model supported by the Eees\_EASDiscovery API.

Table 6.3.5.1-1 specifies the data types defined specifically for the Eees\_EASDiscovery API service.

Table 6.3.5.1-1: Eees\_EASDiscovery API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| ACCharacteristics | 6.3.5.2.11 |  |  |
| DiscoveredEas | 6.3.5.2.8 |  |  |
| EasCharacteristics | 6.3.5.2.7 |  |  |
| EASDiscEventIDs | 6.3.5.3.3 |  |  |
| EasDiscoveryFilter | 6.3.5.2.6 |  |  |
| EasDiscoveryNotification | 6.3.5.2.5 |  |  |
| EasDiscoveryReq | 6.3.5.2.2 |  |  |
| EasDiscoveryResp | 6.3.5.2.3 |  |  |
| EasDiscoverySubscription | 6.3.5.2.4 |  |  |
| EasDiscoverySubscriptionPatch | 6.3.5.2.12 |  |  |
| EasDynamicInfoFilter | 6.3.5.2.9 |  |  |
| EasDynamicInfoFilterData | 6.3.5.2.10 |  |  |
| EdgeLoadAnalytic | 6.3.5.2.14 | Contains the statistical analytics data and predictive analytics data. |  |
| PredictiveData | 6.3.5.2.15 | Contains the predictive analytics data for each discovered EAS service change. |  |
| RequestorId | 6.3.5.2.13 |  |  |
| StatisticalData | 6.3.5.2.16 | Contains the statistical analytics data, |  |

Table 6.3.5.1-2 specifies data types re-used by the Eees\_EASDiscovery API service.

Table 6.3.5.1-2: Re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| ACProfile | clause 6.2.5.2.3 |  |  |
| ACRScenario | 3GPP TS 29.558 [4] |  |  |
| AppGroupProfile | clause 8.1.5.2.X | Represents the application group profile used for Common EAS. | EdgeApp\_2 |
| DateTime | 3GPP TS 29.122 [3] |  |  |
| Dnai | 3GPP TS 29.571 [5] |  |  |
| DurationSec | 3GPP TS 29.122 [3] |  |  |
| EASBundleInfo | 3GPP TS 29.558 [4] | Represents EAS bundle information. | EdgeApp\_2 |
| EASCategory | 3GPP TS 29.558 [4] | Represents the EAS type. |  |
| EASInstantiationInfo | 3GPP TS 29.558 [4] |  | EdgeApp\_2 |
| EASProfile | 3GPP TS 29.558 [4] |  |  |
| EndPoint | 3GPP TS 29.558 [4] |  |  |
| Gpsi | 3GPP TS 29.571 [5] | Used to identify a UE. |  |
| LocationArea5G | 3GPP TS 29.122 [3] |  |  |
| LocationInfo | 3GPP TS 29.122 [3] |  |  |
| PlmnIdNid | 3GPP TS 29.571 [5] | Identifies the network: PLMN Identifier or the SNPN Identifier (the PLMN Identifier and the NID). | EdgeApp\_2 |
| RouteToLocation | 3GPP TS 29.571 [5] |  |  |
| ScheduledCommunicationTime | 3GPP TS 29.122 [3] | Represents the scheduled communication time. | EdgeApp\_2 |
| SupportedFeatures | 3GPP TS 29.571 [5] |  |  |
| TimeWindow | 3GPP TS 29.122 [3] |  |  |
| Uinteger | 3GPP TS 29.571 [5] | Unsigned Integer, i.e. only value 0 and integers above 0 are permissible. | EdgeApp\_2 |
| Uri | 3GPP TS 29.122 [3] |  |  |
| WebsockNotifConfig | 3GPP TS 29.122 [3] |  |  |

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

##### 6.3.5.2.6 Type: EasDiscoveryFilter

Table 6.3.5.2.6-1: Definition of type EasDiscoveryFilter

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| acChars | array(ACCharacteristics) | O | 1..N | AC description for which an EAS is needed |  |
| appGroupProfile | AppGroupProfile | O | 0..1 | Application group profile associated with the AC Profile. | EdgeApp\_2 |
| easChars | array(EasCharacteristics) | O | 1..N | Required EAS characteristics |  |
| NOTE 1: Either acChars or easChars shall be present.  NOTE 2: prefEcsps from the ACProfile shall not be present. | | | | | |

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

##### 6.3.5.2.8 Type: DiscoveredEas

Table 6.3.5.2.8-1: Definition of type DiscoveredEas

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| eas | EASProfile | M | 1 | Contains an EAS matching the discovery request filters |  |
| eesEndPt | EndPoint | O | 0..1 | Endpoint information (e.g. URI, FQDN, IP address) used to communicate with the EES. This information is provided to the EEC to connect to the EES. | EdgeApp\_2 |
| lifeTime | DateTime | O | 0..1 | Indicates the time duration for which the EAS information is valid and supposed to be cached in the EEC. |  |

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

### 6.3.7 Feature negotiation

General feature negotiation procedures are described in clause 7.8 of 3GPP TS 29.558 [4]. Table 6.3.7-1 lists the supported features for Eees\_EASDiscovery API.

Table 6.3.7-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | Notification\_test\_event | Testing of notification connection is supported according to clause 7.6 of 3GPP TS 29.558 [4]. |
| 2 | Notification\_websocket | The delivery of notifications over Websocket is supported according to clause 7.6 of 3GPP TS 29.558 [4]. This feature requires that the Notification\_test\_event feature is also supported. |
| 3 | enNB1 | This feature indicates the support of the support of enhancements to this northbound API in Rel-18. |
| 4 | EdgeApp\_2 | This feature indicates support of the enhancements for the Enabling Edge Applications. Within this feature the following enhancements are covered:  - support of constrained devices for Edge (e.g. support of the EEC with Reduced Capabilities);  - support of the EAS instantiation triggering;  - support of the EAS synchronization;  - support of EAS bundle information;  - support for predicted/expected UE location or Geographical service area during service continuity;  - support for common EAS enhancement without ECS-ER; and  - obtaining edge load analytics information. |

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

##### 7.2.2.2.2 EEC requesting service provisioning information using Eecs\_ServiceProvisioning\_Request operation

To request for the one-time service provisioning information, the EEC shall send an HTTP POST request (custom operation: "Request") to the ECS with the request URI set to"{apiRoot}/eecs-serviceprovisioning/<apiVersion>/request". And the body including the ECSServProvReq data structure, as specified in clause 8.1.5.2.2.

Upon receiving the HTTP POST message from the EEC, the ECS shall:

a) process the EEC service provisioning request information;

b) verify and check if the EEC is authorized to request service provisioning information from ECS;

c) if the EEC is authorized to request service provisioning information from ECS, then the ECS:

1) may obtain the UE's location as specified in clause 5.3 of 3GPP TS 29.122 [3];

2) if AC profile(s) are provided by the EEC without the "appGroupProfile" attribute in the ECSServProvReq data type, the ECS identifies the EES(s) based on the provided AC profile(s) and the UE location, and if the enNB1 feature is supported, the "userLocation" attribute may be provided in the "locInf" attribute within the EasDiscoveryReq data type;

i) if acSvcContSupp information is included in the AC Profile, the matching EES has to support ACRScenario indicated in the acSvcContSupp information; and

ii) for each AC Profile, if eass information is included in the AC Profile, the ECS identifies the matching EES such that the EES profile matches easId information. ECS may also include EAS instantiation information using "easInstInfos" attribute in eass information;

3) if the EdgeApp\_2 feature is supported and the EEC provided the "appGroupProfile" attribute, then the ECS identifies the matching EES(s) based on the application group identity shared in "appGrpId" attribute and may also utilize the location information in the "expectedSvcArea" attribute if provided;

4) if neither application group profile nor AC profiles(s) are provided:

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

ii. ECS identifies the EES(s) by applying the ECSP policy (e.g. based on the UE location);

5) if the EdgeApp\_2 feature is supported:

i. the ECS may identify the EES based on the EEC service continuity support information and EES service continuity support information; and

ii. if the EEC provided the list of desired ECSP identifiers within the "ecspIds" attribute, the ECS shall identify the matching EESs based on the registered ECSP identifier in EES profile and the received list of desired ECSP identifiers; and

iii) if the ECS is provisioned with authentication methods supported by matching EES(s) as specified in clause 6.3 of 3GPP TS 33.558 [7], then the ECS may include the "eesAuthMethods" attribute for each candidate EES(s) as specified in clause 8.1.5.2.9 in the ECSServProvResp and if multiple authentication methods are supported by the EES, then it is left to the EEC implementation to choose any method it supports when it communicates with the EES; and

6) the ECS also determines other information that needs to be provisioned, e.g. identification of the EDN, EDN service area, EES endpoints; and

d) if the ECS is able to determine service provisioning information using the inputs in service provisioning request, UE-specific service information at the ECS or the ECSP's policy, then the ECS returns an HTTP "200 OK" status code response with the response body including the ECSServProvResp data structure which may include the lifetime of the provided EDN configuration information.

If the inputs in service provisioning request do not match any EDN configuration information (i.e. there is no client side error), the ECS sends an HTTP "204 No Content" status code response code.

Otherwise, the ECS shall reject the service provisioning request and respond with an appropriate failure cause.

The EEC may cache the service provisioning information (e.g. EES endpoint). If the lifeTime attribute is included in the service provisioning response, then the EEC may cache and reuse the service provisioning information only for the duration specified by the lifeTime attribute.

The EEC may select one or more EES to perform EAS discovery, for multiple EES(s) case, if instantiable EAS information using "easInstInfos" attribute for an EAS is not available, or the instantiable EAS information using "easInstInfos" attribute is set to instantiated or instantiable.

The EEC may consider the instantiable EAS information using "easInstInfos" attribute and the associated instantiation criteria to mitigate the waste of EDN resources for EAS discovery. The EEC selects one EES, if the EAS instantiation status corresponding to the EASID requested by AC/EEC is instantiable but not yet instantiated (i.e., no instantiated EAS).

NOTE 2: If the EAS instantiation fails based on the selected EES, the EEC retries the EAS discovery request to another EES ((e.g. selecting another one EES based on the instantiable EAS information).

NOTE 3: How EEC maintains the service provisioning information is implementation specific.

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

#### 8.1.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 of 3GPP TS 29.558 [4] apply to this API.

Table 8.1.5.1-1 specifies the data types defined specifically for the Eecs\_ServiceProvisioning API service.

Table 8.1.5.1-1: Eecs\_ServiceProvisioning API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| AppGroupProfile | 8.1.5.2.X | Represents the application group profile used for Common EAS. | EdgeApp\_2 |
| ConnectivityInfo | 8.1.5.2.5 |  |  |
| ECSServProvReq | 8.1.5.2.2 |  |  |
| ECSServProvResp | 8.1.5.2.3 |  |  |
| ECSServProvSubscription | 8.1.5.2.4 | Represents the service provisioning subscription. |  |
| ECSServProvSubscriptionPatch | 8.1.5.2.10 |  |  |
| EDNConfigInfo | 8.1.5.2.7 |  |  |
| EDNConInfo | 8.1.5.2.8 |  |  |
| EESInfo | 8.1.5.2.9 |  |  |
| ServProvNotification | 8.1.5.2.6 | Service provisioning information notification from ECS to EEC. |  |

Table 8.1.5.1-2 specifies data types re-used by the Eecs\_ServiceProvisioning API service.

Table 8.1.5.1-2: Re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| ACProfile | clause 6.2.5.2.3 |  |  |
| ACRScenario | 3GPP TS 29.558 [4] |  |  |
| DateTime | 3GPP TS 29.122 [3] |  |  |
| Dnai | 3GPP TS 29.571 [5] |  |  |
| Dnn | 3GPP TS 29.571 [5] |  |  |
| EASBundleInfo | 3GPP TS 29.558 [4] | Represents EAS bundle information. | EdgeApp\_2 |
| EASInstantiationInfo | 3GPP TS 29.558 [4] |  |  |
| EndPoint | 3GPP TS 29.558 [4] |  |  |
| Gpsi | 3GPP TS 29.571 [5] | Used to identify the UE. |  |
| LocationArea5G | 3GPP TS 29.122 [3] |  |  |
| LocationInfo | 3GPP TS 29.122 [3] | The location information related to the UE. |  |
| PlmnIdNid | 3GPP TS 29.571 [5] | Identifies the network: PLMN Identifier or the SNPN Identifier (the PLMN Identifier and the NID). |  |
| Snssai | 3GPP TS 29.571 [5] |  |  |
| SupportedFeatures | 3GPP TS 29.571 [5] | Used to negotiate the applicability of optional features. |  |
| Uri | 3GPP TS 29.122 [3] |  |  |
| WebsockNotifConfig | 3GPP TS 29.122 [3] |  |  |

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

##### 8.1.5.2.2 Type: ECSServProvReq

Table 8.1.5.2.2-1: Definition of type ECSServProvReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| eecId | string | M | 0..1 | Represents a unique identifier of the EEC. |  |
| ueId | Gpsi | O | 0..1 | Represents the identifier of the UE. |  |
| acProfs | array(ACProfile) | O | 1..N | Information about services the EEC wants to connect to. |  |
| appGroupProfile | AppGroupProfile | O | 0..1 | Application group profile associated with the AC Profile. | EdgeApp\_2 |
| eecSvcContSupp | array(ACRScenario) | O | 1..N | The ACR scenarios supported by the EEC for service continuity. If this attribute is not present, then the EEC does not support service continuity.  (NOTE) |  |
| connInfo | array(ConnectivityInfo) | O | 0..N | List of connectivity information for the UE. |  |
| locInf | LocationInfo | O | 0..1 | Represents location information of the UE.  If the UserLocation feature is supported, the "userLocation" attribute shall be provided in the LocationInfo data type. |  |
| ecspIds | array(string) | O | 1..N | Indicates to the ECS which EES providers are preferred by the EEC. | EdgeApp\_2 |
| suppFeat | SupportedFeatures | C | 0..1 | Represents a list of Supported features used as described in clause 6.3.7.  Shall be present in the HTTP POST request/response. |  |
| NOTE: If the EEC is requesting service provisioning for T-EES discovery and requires those T-EES that support "EEC excuted ACR via T-EES" scenario, then EEC shall set eecSvcContSupp with only "EEC excuted ACR via T-EES". | | | | | |

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

##### 8.1.5.2.9 Type: EESInfo

Table 8.1.5.2.9-1: Definition of type EESInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| eesId | string | M | 1 | The identifier of the EES |  |
| endPt | EndPoint | M | 1 | Endpoint information (e.g. URI, FQDN, IP address) used to communicate with the EES. This information is provided to the EEC to connect to the EES. |  |
| easIds | array(string) | O | 1..N | The list of application identifiers of the Edge Application Servers registered or expected to be registered with the EES, e.g. FQDN, URI. |  |
| appGroupIdList | array(string) | O | 1..N | List of Application Group IDs associated with EAS. | EdgeApp\_2 |
| ecspInfo | string | O | 0..1 | String representing the EES Provider (such as ECSP Information) |  |
| svcArea | LocationArea5G | O | 0..1 | The list of geographical and topological areas that the EES serves. EECs in the UE that are outside the area shall not be served. |  |
| dnais | array(Dnai) | O | 1..N | Represents list of Data network access identifier |  |
| eesSvcContSupp | array(ACRScenario) | O | 1..N | The ACR scenarios supported by the EES for service continuity. If this attribute is not present, then the EEC does not support service continuity. |  |
| eecRegConf | boolean | M | 1 | Indicates whether the EEC is required to register on the EES to use edge services or not |  |
| easInstInfos | array(EASInstantiationInfo) | O | 1..N | The EAS instantiation status per EASID (e.g. instantiated, instantiable but not be instantiated yet) | EdgeApp\_2 |
| eesAuthMethods | array(EesAuthMethod) | O | 1..N | Indicates the authentication method supported by the EES to be used by EEC before communicating with the EES as specified in clause 8.1.5.2.11. | EdgeApp\_2 |
| easBundleInfo | array(EASBundleInfo) | O | 1..N | Represents a list of EAS bundles to which the EAS belongs.(NOTE) | EdgeApp\_2 |
| NOTE: In case of ECS Service Provisioning response, the "easBdlReqs" and "mainEasId" attributes shall not be present within the "easBundleInfo" attribute. | | | | | |

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

##### 8.1.5.2.X Type: AppGroupProfile

Table 8.1.5.2.X-1: Definition of type AppGroupProfile

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| appGrpId | string | M | 1 | Contains the identifier of the application group that uniquely identifies the group of UEs using the same application. |  |
| easId | string | M | 1 | Contains the application identifier of the EAS, e.g. FQDN, URI. |  |
| expectedSvcArea | LocationArea5G | O | 0..1 | Service availability area (geographical and topological) for each selected EAS identifier. |  |

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

### 8.1.7 Feature negotiation

General feature negotiation procedures are described in clause 7.8 of 3GPP TS 29.558 [4]. Table 8.1.7-1 lists the supported features for Eecs\_ServiceProvisioning API.

Table 8.1.7-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | Notification\_test\_event | Testing of notification connection is supported according to clause 7.6 of 3GPP TS 29.558 [4]. |
| 2 | Notification\_websocket | The delivery of notifications over Websocket is supported according to clause 7.6 of 3GPP TS 29.558 [4]. This feature requires that the Notification\_test\_event feature is also supported. |
| 3 | enNB1 | This feature indicates the support of enhancements to this northbound API in Rel-18. |
| 4 | EdgeApp\_2 | This feature indicates support of the enhancements for the Enabling Edge Applications. Within this feature the following enhancements are covered:  - support of enhanced EES service differentiation;  - support of Edge computing in SNPN;  - support of EAS bundle information;  - support of EAS instantiation;  - support for common EAS enhancement without ECS-ER; and  - the EEC support of application triggering to perform ECS service provisioning. |

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

# A.3 Eees\_EASDiscovery API

openapi: 3.0.0

info:

title: Eees\_EASDiscovery

description: |

API for EAS Discovery.

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version: "1.1.0-alpha.4"

externalDocs:

description: >

3GPP TS 24.558 V18.3.0 Enabling Edge Applications; Protocol specification.

url: https://www.3gpp.org/ftp/Specs/archive/24\_series/24.558/

security:

- {}

- oAuth2ClientCredentials: []

servers:

- url: '{apiRoot}/eees-easdiscovery/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 7.5 of 3GPP TS 29.558.

paths:

/subscriptions:

post:

description: Creates a new individual EAS discovery subscription.

operationId: CreateEASDiscSub

tags:

- EAS Discovery Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/EasDiscoverySubscription'

responses:

'201':

description: >

Created. A new Individual EAS Discovery Subscription resource was successfully

created.

content:

application/json:

schema:

$ref: '#/components/schemas/EasDiscoverySubscription'

headers:

Location:

description: Contains the URI of the newly created resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

notificationDestination:

'{request.body#/notificationDestination}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/EasDiscoveryNotification'

responses:

'204':

description: No Content (The receipt of the Notification is acknowledged).

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:

put:

description: >

Updates an existing individual EAS discovery subscription identified by the subscriptionId.

operationId: UpdateIndEASDiscSub

tags:

- Individual EAS Discovery Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Identifies an individual EAS discovery subscription resource.

required: true

schema:

type: string

requestBody:

description: Parameters to replace the existing subscription.

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/EasDiscoverySubscription'

responses:

'200':

description: >

OK. The individual EAS discovery subscription resource was updated successfully.

content:

application/json:

schema:

$ref: '#/components/schemas/EasDiscoverySubscription'

'204':

description: No Content (updated successfully).

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

description: >

Deletes an existing individual EAS discovery subscription identified by the subscriptionId.

operationId: DeleteIndEASDiscSub

tags:

- Individual EAS Discovery Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Identifies an individual EAS discovery subscription resource.

required: true

schema:

type: string

responses:

'204':

description: >

An individual EAS discovery subscription resource deleted successfully.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

description: >

Partial update an existing EAS Discovery Subscription resource identified by a

subscriptionId.

operationId: ModifyIndEASDiscSub

tags:

- Individual EAS Discovery Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Identifies an individual EAS discovery subscription resource.

required: true

schema:

type: string

requestBody:

description: Parameters to replace the existing subscription.

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/EasDiscoverySubscriptionPatch'

responses:

'200':

description: >

OK (An individual EAS discovery subscription resource updated successfully).

content:

application/json:

schema:

$ref: '#/components/schemas/EasDiscoverySubscription'

'204':

description: No Content (modified successfully).

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/eas-profiles/request-discovery:

post:

description: >

Provides EAS information requested by the service consumer (i.e. EEC, EAS or EES).

operationId: GetEASDiscInfo

tags:

- EAS Profiles (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/EasDiscoveryReq'

responses:

'200':

description: >

OK (The requested EAS discovery information was returned successfully).

content:

application/json:

schema:

$ref: '#/components/schemas/EasDiscoveryResp'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

EasDiscoveryReq:

description: EAS discovery request information.

type: object

properties:

requestorId:

$ref: '#/components/schemas/RequestorId'

ueId:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'

easDiscoveryFilter:

$ref: '#/components/schemas/EasDiscoveryFilter'

eecSvcContinuity:

type: array

items:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/ACRScenario'

description: >

Indicates if the EEC supports service continuity or not, also indicates which ACR

scenarios are supported by the EEC.

eesSvcContinuity:

type: array

items:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/ACRScenario'

description: >

Indicates if the EES supports service continuity or not, also indicates which ACR

scenarios are supported by the EES.

easSvcContinuity:

type: array

items:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/ACRScenario'

description: >

Indicates if the EAS supports service continuity or not, also indicates which ACR

scenarios are supported by the EAS.

locInf:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/LocationInfo'

easTDnai:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnai'

easSelSupInd:

type: boolean

description: >

Indicates if the EEC requires the EAS selection support from the EES (e.g., for

constrained device). The default value false indicates the EAS selection is not

required from the EES.

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

easIntTrigSup:

type: boolean

description: >

Indicates to the EES whether the EAS instantiation triggering should be performed for

the current request. The default value false indicates the EAS instantiation triggering

should not be performed. The true value indicate the EAS instantiation triggering should

be performed.

predictExpTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

servingPLMNInfo:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/PlmnIdNid'

svcContinuityPlanInd:

type: boolean

description: >

Indicates to the EES whether the EAS discovery request is triggered as part of service

continuity planning. The default value false indicates this request is not part of

service continuity planning. The true value indicate this request is part of

service continuity planning.

required:

- requestorId

EasDiscoveryResp:

description: EAS discovery response.

type: object

properties:

discoveredEas:

type: array

items:

$ref: '#/components/schemas/DiscoveredEas'

description: List of EAS discovery information.

easInstInfos:

type: object

additionalProperties:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/EASInstantiationInfo'

minProperties: 1

description: >

Contains the EAS instantiation information for each discovered EAS returned within

the discoveredEas attribute.

edgeLoadAnalytics:

type: object

additionalProperties:

$ref: '#/components/schemas/EdgeLoadAnalytic'

minProperties: 1

description: >

Contains the statistical analytics data and predictive analytics data for each

discovered application server. The key of the map shall be the EAS ID to which

the provided analytics data within the map value relates.

required:

- discoveredEas

EasDiscoverySubscription:

description: Represents an Individual EAS Discovery Subscription resource.

type: object

properties:

eecId:

type: string

description: Represents a unique identifier of the EEC.

ueId:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'

easEventType:

$ref: '#/components/schemas/EASDiscEventIDs'

easDiscoveryFilter:

$ref: '#/components/schemas/EasDiscoveryFilter'

easDynInfoFilter:

$ref: '#/components/schemas/EasDynamicInfoFilter'

easSvcContinuity:

type: array

items:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/ACRScenario'

description: >

Indicates if the EEC supports service continuity or not, also indicates which ACR

scenarios are supported by the EEC.

expTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

notificationDestination:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

requestTestNotification:

type: boolean

description: >

Set to true by Subscriber to request the EES to send a test notification. Set to false

or omitted otherwise.

websockNotifConfig:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/WebsockNotifConfig'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

easIntTrigSup:

type: boolean

description: >

Indicates to the EES whether the EAS instantiation triggering should be performed for

the current request. The default value false indicates the EAS instantiation triggering

should not be performed. The true value indicate the EAS instantiation triggering should

be performed.

eecTriggerRequest:

type: boolean

description: >

Indicates to the EES whether the application triggering is required by the EEC.

Default value false indicates the application triggering is not required.

required:

- eecId

- easEventType

EasDiscoveryNotification:

description: Notification of EAS discovery information.

type: object

properties:

subId:

type: string

description: >

Identifier of the individual service provisioning subscription for which the service

provisioning notification is delivered.

eventType:

$ref: '#/components/schemas/EASDiscEventIDs'

discoveredEas:

type: array

items:

$ref: '#/components/schemas/DiscoveredEas'

minItems: 1

description: List of EAS discovery information.

easInstInfos:

type: object

additionalProperties:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/EASInstantiationInfo'

minProperties: 1

description: >

Contains the EAS instantiation information for each discovered EAS returned within

the "discoveredEas" attribute.

edgeLoadAnalytics:

type: object

additionalProperties:

$ref: '#/components/schemas/EdgeLoadAnalytic'

minProperties: 1

description: >

Contains the statistical analytics data and predictive analytics data for each

discovered application server. The key of the map shall be the EAS ID to which

the provided analytics data within the map value relates.

required:

- subId

- eventType

- discoveredEas

EasDiscoveryFilter:

description: Represents the EAS characteristics.

type: object

properties:

acChars:

type: array

items:

$ref: '#/components/schemas/ACCharacteristics'

minItems: 1

description: AC description for which an EAS is needed.

appGroupProfile:

$ref: 'TS24558\_Eecs\_ServiceProvisioning.yaml#/components/schemas/AppGroupProfile'

easChars:

type: array

items:

$ref: '#/components/schemas/EasCharacteristics'

minItems: 1

description: Required EAS chararcteristics.

EasCharacteristics:

description: Represents the EAS chararcteristics.

type: object

properties:

easId:

type: string

description: EAS application identifier.

appGrpId:

type: string

description: >

Application group identifier, identifying a group of UEs using the same

application service.

easSyncInd:

type: boolean

description: >

Indicates whether the synchronization between the EASs is required. The

default value false indicates the EAS synchronization is not required.

easProvId:

type: string

description: EAS provider identifier.

stdEasType:

$ref: 'TS29558\_Eees\_EASRegistration.yaml#/components/schemas/EASCategory'

easType:

type: string

description: EAS type with the flexible value set.

easSched:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'

svcArea:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'

easSvcContinuity:

type: array

items:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/ACRScenario'

description: >

Indicates if the EEC supports service continuity or not, also indicates which ACR

scenarios are supported by the EEC.

svcPermLevel:

type: string

description: Service permissions level.

svcFeats:

type: array

items:

type: string

minItems: 1

description: Service features.

easBundleInfo:

$ref: 'TS29558\_Eees\_EASRegistration.yaml#/components/schemas/EASBundleInfo'

not:

required: [stdEasType, easType]

DiscoveredEas:

description: Represents an EAS discovery information.

type: object

properties:

eas:

$ref: 'TS29558\_Eees\_EASRegistration.yaml#/components/schemas/EASProfile'

eesEndPt:

$ref: 'TS29558\_Eees\_EASRegistration.yaml#/components/schemas/EndPoint'

lifeTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

required:

- eas

EasDynamicInfoFilter:

description: Represents EAS dynamic information changes filter.

type: object

properties:

dynInfoFilter:

type: array

items:

$ref: '#/components/schemas/EasDynamicInfoFilterData'

minItems: 1

description: List of EAS dynamic information required by the EEC per EAS.

required:

- dynInfoFilter

EasDynamicInfoFilterData:

description: Represents an EAS dynamic information.

type: object

properties:

eecId:

type: string

description: The application identifier of the EAS, e.g. FQDN, URI.

easStatus:

type: boolean

description: Notify if EAS status changed.

easAcIds:

type: boolean

description: Notify if list of AC identifiers changed.

easDesc:

type: boolean

description: Notify if EAS description changed.

easPt:

type: boolean

description: Notify if EAS endpoint changed.

easEndPoint:

$ref: 'TS29558\_Eees\_EASRegistration.yaml#/components/schemas/EndPoint'

easFeature:

type: boolean

description: Notify if EAS feature changed.

easSchedule:

type: boolean

description: Notify if EAS schedule changed.

svcArea:

type: boolean

description: Notify if EAS service area changed.

svcKpi:

type: boolean

description: Notify if EAS KPIs changed.

svcCont:

type: boolean

description: Notify if EAS supported ACR changed.

required:

- eecId

ACCharacteristics:

description: Represents EAS dynamic information changes filter.

type: object

properties:

acProf:

$ref: 'TS24558\_Eees\_EECRegistration.yaml#/components/schemas/ACProfile'

required:

- acProf

EASDiscEventIDs:

anyOf:

- type: string

enum:

- EAS\_AVAILABILITY\_CHANGE

- EAS\_DYNAMIC\_INFO\_CHANGE

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration but is not used to encode

content defined in the present version of this API.

description: >

Possible values are

- EAS\_AVAILABILITY\_CHANGE: Represents the EAS availability change event.

- EAS\_DYNAMIC\_INFO\_CHANGE: Represents the EAS dynamic information change event.

EasDiscoverySubscriptionPatch:

description: Represents an Individual EAS Discovery Subscription resource.

type: object

properties:

easDiscoveryFilter:

$ref: '#/components/schemas/EasDiscoveryFilter'

easDynInfoFilter:

$ref: '#/components/schemas/EasDynamicInfoFilter'

easSvcContinuity:

type: array

items:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/ACRScenario'

description: >

Indicates if the EEC supports service continuity or not, also indicates which ACR

scenarios are supported by the EEC.

expTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

easEventType:

$ref: '#/components/schemas/EASDiscEventIDs'

RequestorId:

description: Represents identifier of the requestor.

type: object

properties:

eesId:

type: string

description: The identifier of the EES (e.g. S-EES).

easId:

type: string

description: The application identifier of the EAS (e.g. S-EAS), e.g. FQDN, URI.

eecId:

type: string

description: The identifier of the EEC.

oneOf:

- required: [eesId]

- required: [easId]

- required: [eecId]

EdgeLoadAnalytic:

description: >

Contains the statistical analytics data and predictive analytics data for each

discovered application server.

type: object

properties:

easId:

type: string

description: The application identifier of the EAS, e.g. FQDN, URI.

predictData:

$ref: '#/components/schemas/PredictiveData'

statisticData:

$ref: '#/components/schemas/StatisticalData'

required:

- easId

PredictiveData:

description: >

Contains the predictive analytics data for each discovered EAS service status

(e.g. EAS schedule, EAS status) change.

type: object

properties:

scheds:

type: array

items:

$ref: 'TS29122\_CpProvisioning.yaml#/components/schemas/ScheduledCommunicationTime'

minItems: 1

status:

type: string

description: Indicates the EAS status (e.g. Enabled, Disabled etc.).

StatisticalData:

description: >

Contains the statistical analytics data (e.g. number of times the client received

expected performance from the EAS).

type: object

properties:

numRecPerf:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

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

# B.1 Eecs\_ServiceProvisioning

openapi: 3.0.0

info:

title: Eecs\_ServiceProvisioning

version: "1.1.0-alpha.4"

description: |

API for ECS Service Provisioning.

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externalDocs:

description: 3GPP TS 24.558 V18.3.0 Enabling Edge Applications; Protocol specification.

url: https://www.3gpp.org/ftp/Specs/archive/24\_series/24.558/

security:

- {}

- oAuth2ClientCredentials: []

servers:

- url: '{apiRoot}/eecs-serviceprovisioning/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 7.5 of 3GPP TS 29.558

paths:

/subscriptions:

post:

description: >

Creates a new subscription in ECS in order to be notified of provisioning data

changes of interest.

operationId: CreateServProvSub

tags:

- Service Provisioning Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/ECSServProvSubscription'

callbacks:

notificationDestination:

'{request.body#/notificationDestination}':

post:

requestBody: # contents of the callback message

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/ServProvNotification'

responses:

'204':

description: No Content (successful notification)

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

responses:

'201':

description: >

Individual ECS Service Provisioning Subscription resource created successfully.

content:

application/json:

schema:

$ref: '#/components/schemas/ECSServProvSubscription'

headers:

Location:

description: 'Contains the URI of the newly created resource'

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:

put:

description: >

Updates an existing individual service provisioning subscription identified

by the subscriptionId.

operationId: UpdateIndServProvSub

tags:

- Individual Service Provisioning Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Identifies an individual service provisioning subscription.

required: true

schema:

type: string

requestBody:

description: Parameters to replace the existing subscription.

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/ECSServProvSubscription'

responses:

'200':

description: >

OK (The individual service provisioning subscription matching the subscriptionId

was modified successfully).

content:

application/json:

schema:

$ref: '#/components/schemas/ECSServProvSubscription'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

description: >

Deletes an existing individual service provisioning subscription identified by

the subscriptionId.

operationId: DeleteIndServProvSub

tags:

- Individual Service Provisioning Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Identifies an individual service provisioning subscription.

required: true

schema:

type: string

responses:

'204':

description: >

The individual service provisioning subscription matching the subscriptionId is

deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

description: >

Partially updates an existing individual service provisioning subscription identified

by the subscriptionId.

operationId: ModifyIndServProvSub

tags:

- Individual Service Provisioning Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Identifies an individual service provisioning subscription.

required: true

schema:

type: string

requestBody:

description: Parameters to replace the existing subscription.

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/ECSServProvSubscriptionPatch'

responses:

'200':

description: >

OK (The individual service provisioning subscription matching the subscriptionId

was modified successfully).

content:

application/json:

schema:

$ref: '#/components/schemas/ECSServProvSubscription'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/request:

post:

summary: Request service provisioning information.

operationId: RequestServProv

tags:

- Request Service Provisioning

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/ECSServProvReq'

responses:

'200':

description: >

OK (The requested service provisioning information was returned successfully).

content:

application/json:

schema:

$ref: '#/components/schemas/ECSServProvResp'

'204':

description: >

No Content (The requested service provisioning information does not exist).

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

ECSServProvReq:

description: ECS service provisioning request information.

type: object

properties:

eecId:

type: string

description: Represents a unique identifier of the EEC.

ueId:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'

acProfs:

type: array

items:

$ref: 'TS24558\_Eees\_EECRegistration.yaml#/components/schemas/ACProfile'

description: Information about services the EEC wants to connect to.

appGroupProfile:

$ref: '#/components/schemas/AppGroupProfile'

eecSvcContSupp:

type: array

items:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/ACRScenario'

description: >

Indicates if the EEC supports service continuity or not, also indicates which

ACR scenarios are supported by the EEC.

connInfo:

type: array

items:

$ref: '#/components/schemas/ConnectivityInfo'

description: List of connectivity information for the UE.

locInf:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/LocationInfo'

ecspIds:

type: array

items:

type: string

minItems: 1

description: Indicates to the ECS which EES providers are preferred by the EEC.

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- eecId

ECSServProvResp:

description: ECS service provisioning response information.

type: object

properties:

ednCnfgInfo:

type: array

items:

$ref: '#/components/schemas/EDNConfigInfo'

minItems: 1

description: List of EDN configuration information.

required:

- ednCnfgInfo

ECSServProvSubscription:

description: Represents an individual service provisioning subscription resource.

type: object

properties:

eecId:

type: string

description: Represents a unique identifier of the EEC.

ueId:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'

acProfs:

type: array

items:

$ref: 'TS24558\_Eees\_EECRegistration.yaml#/components/schemas/ACProfile'

description: Information about services the EEC wants to connect to.

expTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

eecSvcContSupp:

type: array

items:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/ACRScenario'

description: >

Indicates if the EEC supports service continuity or not, also indicates which

ACR scenarios are supported by the EEC.

connInfo:

type: array

items:

$ref: '#/components/schemas/ConnectivityInfo'

description: List of connectivity information for the UE.

notificationDestination:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

requestTestNotification:

type: boolean

description: >

Set to true by Subscriber to request the ECS to send a test notification. Set to

false or omitted otherwise.

websockNotifConfig:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/WebsockNotifConfig'

ecspIds:

type: array

items:

type: string

minItems: 1

description: Indicates to the ECS which EES providers are preferred by the EEC.

eecTriggerRequest:

type: boolean

description: >

Indicates to the ECS, whether the application triggering is required by the EEC.

Default value false indicates the application triggering is not required.

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- eecId

ServProvNotification:

description: Represents notification information of a service provisioning Event.

type: object

properties:

subId:

type: string

description: >

Identifier of the individual service provisioning subscription for which the service

provisioning notification is delivered.

ednCnfgInfo:

type: array

items:

$ref: '#/components/schemas/EDNConfigInfo'

minItems: 1

description: List of EDN configuration information.

required:

- subId

- ednCnfgInfo

ConnectivityInfo:

description: Represents the connectivity information for the UE.

type: object

properties:

plmnId:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/PlmnIdNid'

ssId:

type: string

description: Identifies the SSID of the access point to which the UE is attached.

AppGroupProfile:

description: Represents the application group profile for common EAS.

type: object

properties:

appGrpId:

type: string

description: Represents the application group that uniquely identifies

the group of UEs using the same application.

easId:

type: string

description: Represents the application identifier of the EAS.

expectedSvcArea:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'

required:

- appGrpId

- easId

EDNConfigInfo:

description: Represents the EDN configuration information.

type: object

properties:

ednConInfo:

$ref: '#/components/schemas/EDNConInfo'

eess:

type: array

items:

$ref: '#/components/schemas/EESInfo'

minItems: 1

description: Contains the list of EESs of the EDN.

lifeTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

required:

- ednConInfo

- eess

EDNConInfo:

description: Represents an EDN connection information.

type: object

properties:

dnn:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'

snssai:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'

ednTopoSrvArea:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'

EESInfo:

description: Represents EES information.

type: object

properties:

eesId:

type: string

description: Identity of the EES.

endPt:

$ref: 'TS29558\_Eees\_EASRegistration.yaml#/components/schemas/EndPoint'

easIds:

type: array

items:

type: string

description: >

Application identities of the Edge Application Servers registered

with the EES.

appGroupIdList:

type: array

items:

type: string

description: List of Application Group IDs associated with EAS.

ecspInfo:

type: string

description: Represents an ECSP Information.

svcArea:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'

dnais:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnai'

description: Represents list of Data network access identifiers.

eesSvcContSupp:

type: array

items:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/ACRScenario'

description: >

Indicates if the EES supports service continuity or not, also indicates which ACR

scenarios are supported by the EES.

eecRegConf:

type: boolean

description: >

Indicates whether the EEC is required to register on the EES to use edge services

or not.

easInstInfos:

type: array

items:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/EASInstantiationInfo'

minItems: 1

description: >

The EAS instantiation status per EASID (e.g. instantiated, instantiable but not be

instantiated yet).

eesAuthMethods:

type: array

items:

$ref: '#/components/schemas/EesAuthMethod'

minItems: 1

description: >

Indicates the authentication methods supported by the EES.

easBundleInfo:

$ref: 'TS29558\_Eees\_EASRegistration.yaml#/components/schemas/EASBundleInfo'

required:

- eesId

- eecRegConf

EesAuthMethod:

anyOf:

- type: string

enum:

- TLS\_CLIENT\_SERVER\_CERTIFICATE

- TLS\_WITH\_AKMA

- TLS\_WITH\_GBA

- SERVER\_SIDE\_CERTIFICATE\_BASED

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration and is not used to encode

content defined in the present version of this API.

description: |

Represents the Authentication methods supported by EES.

Possible values are:

- TLS\_CLIENT\_SERVER\_CERTIFICATE: Represents TLS with client server certificate

authentication.

- TLS\_WITH\_AKMA: Represents TLS with AKMA authentication.

- TLS\_WITH\_GBA: Represents TLS with GBA authentication.

- SERVER\_SIDE\_CERTIFICATE\_BASED: Represents server side certification only.

ECSServProvSubscriptionPatch:

description: >

Represents modifications to an individual service provisioning subscription resource.

type: object

properties:

acProfs:

type: array

items:

$ref: 'TS24558\_Eees\_EECRegistration.yaml#/components/schemas/ACProfile'

description: Information about services the EEC wants to connect to.

expTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

eecSvcContSupp:

type: array

items:

$ref: 'TS29558\_Eecs\_EESRegistration.yaml#/components/schemas/ACRScenario'

description: >

Indicates which ACR scenarios are supported by the EEC.

connInfo:

type: array

items:

$ref: '#/components/schemas/ConnectivityInfo'

description: List of connectivity information for the UE.

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