**3GPP TSG-CT WG3 Meeting #114eC3-211505**

**E-Meeting, 24th February – 05th March 2021** *(revision of C3-211368)*

**Source: Samsung**

**Title: Pseudo-CR on Eees\_EASRegistration API definition**

**Spec: 3GPP TS 29.558 v0.1.0**

**Agenda item: 17.9**

**Document for: Decision**

**1. Introduction**

This contribution proposes the service description for Eees\_EASRegistration API.

**2. Reason for Change**

TS 23.558 specifies the procedures and information flows for an EAS to register itself, update its registration and deregister at a given EES, using the Eees\_EASRegisration service API. The details of the API definition along with data model need to be specified.

**3. Conclusions**

<Conclusion part (optional)>

**4. Proposal**

It is proposed to agree the following changes to 3GPP TS 29.558 v0.1.0.

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

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.558: "Architecture for enabling Edge Applications".

[3] Open API: "OpenAPI Specification Version 3.0.0.", <https://spec.openapis.org/oas/v3.0.0>.

[4] 3GPP TR 21.900: "Technical Specification Group working methods".

[5] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[r29571] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".[r29510] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

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

## 8.y Eees\_EASRegistration API

### 8.y.1 API URI

The Eees\_EASRegistration service shall use the Eees\_EASRegistration API.

The request URIs used in HTTP requests from the Edge Application Server towards the Edge Enabler Server shall have the Resource URI structure as defined in clause 7.5 with the following clarifications:

- The <apiName>shall be "eees-easregistration".

- The <apiVersion> shall be "v1".

- The <apiSpecificResourceUriPart> shall be set as described in clause 8.y.2.

### 8.y.2 Resources

#### 8.y.2.1 Overview



Figure 8.y.2.1-1: Resource URI structure of the Eees\_EASRegistration API

Table 8.y.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.y.2.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| EAS Registrations | /registrations | POST | Registers a new EAS at the Edge Enabler Server. |
| Individual EAS Registration | /registrations/{registrationId} | GET | Fetch an individual EAS registration resource. |
| PUT | Update an individual EAS registration resource. |
| DELETE | Remove an individual EAS registration resource. |

Editor’s Note: It is FFS, to obtain the EAS registration information from the "EAS Registrations" collection resource.

Editor’s Note: Whether PATCH method will be used to partially update the EAS registration information is FFS.

#### 8.y.2.2 Resource: EAS Registrations

##### 8.y.2.2.1 Description

This resource represents all the Edge Application Servers that are registered at a given Edge Enabler Server.

##### 8.y.2.2.2 Resource Definition

Resource URI: **{apiRoot}/eees-easregistration/<apiVersion>/registrations**

This resource shall support the resource URI variables defined in the table 8.y.2.2.2-1.

Table 8.y.2.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 7.5 |
| apiVersion | string | See clause 8.y.1 |

##### 8.y.2.2.3 Resource Standard Methods

###### 8.y.2.2.3.1 POST

This method shall support the URI query parameters specified in table 8.y.2.2.3.1-1.

Table 8.y.2.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 8.y.2.2.3.1-2 and the response data structures and response codes specified in table 8.y.2.2.3.1-3.

Table 8.y.2.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| EASRegistration | M | 1 | EAS registration request information. |

Table 8.y.2.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| EASRegistration | M | 1 | 201 Created | EAS information is registered successfully at EES. EAS information registered with EES is provided in the response body.The URI of the created resource shall be returned in the “Location” HTTP header. |
| NOTE: The manadatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [r29122] also apply. |

Table 8.y.2.2.3.1-4: Headers supported by the POST method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

Table 8.y.2.2.3.1-5: Headers supported by the 201 response code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location  | String | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/eees-easregistration/<apiVersion>/registrations/{registrationId} |

Table 8.y.2.2.3.1-6: Links supported by the 200 Response Code on this endpoint

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Resource name | HTTP method or custom operation | Link parameter(s) | Description |
| n/a |  |  |  |  |

##### 8.y.2.2.4 Resource Custom Operations

None.

#### 8.y.2.3 Resource: Individual EAS Registration

##### 8.y.2.3.1 Description

This Individual EAS Registration resource represents an individual EAS registered at a given Edge Enabler Server.

##### 8.y.2.3.2 Resource Definition

Resource URI: **{apiRoot}/eees-easregistration/<apiVersion>/registrations/{registrationId}**

This resource shall support the resource URI variables defined in the table 8.y.2.3.2-1.

Table 8.y.2.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 7.5 |
| apiVersion | string | See clause 8.y.1 |
| registrationId | string | The EAS registration identifier. |

##### 8.y.2.3.3 Resource Standard Methods

###### 8.y.2.3.3.1 GET

This method retrieves the EAS information registered at Edge Enabler Server. This method shall support the URI query parameters specified in table 8.y.2.3.3.1-1.

Table 8.y.2.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 8.y.2.3.3.1-2 and the response data structures and response codes specified in table 8.y.2.3.3.1-3.

Table 8.y.2.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 8.y.2.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| EASResgistration | M | 1 | 200 OK | The EAS registration information at the Edge Enabler Server.  |
| NOTE: The manadatory HTTP error status code for the GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [r29122] also apply. |

Table 8.y.2.3.3.1-4: Headers supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

Table 8.y.2.3.3.1-5: Headers supported by the <e.g. 200> response code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

Table 8.y.2.3.3.1-6: Links supported by the 200 Response Code on this endpoint

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Resource name | HTTP method or custom operation | Link parameter(s) | Description |
| n/a |  |  |  |  |

###### 8.y.2.3.3.2 PUT

This method updates the EAS registration information at Edge Enabler Server by completely replacing the existing registration data (except registrationId). This method shall support the URI query parameters specified in the table 8.y.2.3.3.2-1.

Table 8.y.2.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 8.y.2.3.3.2-2 and the response data structures and response codes specified in table 8.y.2.3.3.2-3.

Table 8.y.2.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| EASRegistration | M | 1 | Details of the EAS registration information to be updated |

Table 8.y.2.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| EASRegistration | M | 1 | 200 OK | The EAS registration information updated successfully and the updated EAS registration information is returned in the response. |
| NOTE: The manadatory HTTP error status code for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [r29122] also apply. |

Editor’s Note: It is FFS, if 204 No Content response message is applicable.

Table 8.y.2.3.3.2-4: Headers supported by the PUT method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

Table 8.y.2.3.3.2-5: Headers supported by the <e.g. 200> response code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

Table 8.y.2.3.3.2-6: Links supported by the 200 Response Code on this endpoint

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Resource name | HTTP method or custom operation | Link parameter(s) | Description |
| n/a |  |  |  |  |

###### 8.y.2.3.3.3 DELETE

This method deregisters an EAS registration from the EES. This method shall support the URI query parameters specified in the table 8.y.2.3.3.3-1.

Table 8.y.2.3.3.3-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 8.y.2.3.3.3-2 and the response data structures and response codes specified in table 8.y.2.3.3.3-3.

Table 8.y.2.3.3.3-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Editor’s Note: Details of how the EAS security credentials are submitted in the HTTP DELETE message is FFS and to be updated based on security aspects defined by SA3.

Table 8.y.2.3.3.3-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| n/a |  |  | 204 No Content | The individual EAS registration information matching the registrationId is deleted. |
| NOTE: The manadatory HTTP error status code for the DELETE method listed in Table 5.2.6-1 of 3GPP TS 29.122 [r29122] also apply. |

Table 8.y.2.3.3.3-4: Headers supported by the DELETE method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

Table 8.y.2.3.3.3-5: Headers supported by the <e.g. 200> response code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

Table 8.y.2.3.3.3-6: Links supported by the 200 Response Code on this endpoint

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Resource name | HTTP method or custom operation | Link parameter(s) | Description |
| n/a |  |  |  |  |

##### 8.y.2.3.4 Resource Custom Operations

None.

### 8.y.3 Custom Operations without associated resources

None.

### 8.y.4 Notifications

None.

### 8.y.5 Data Model

#### 8.y.5.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 7.2 apply to this API

Table 8.y.5.1-1 specifies the data types defined specifically for the Eees\_EASRegistration API service.

Table 8.y.5.1-1: Eees\_EASRegistration API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| EASRegistration | 8.y.5.2.2 | The EAS registration information on EES. |  |
| EASProfile | 8.y.5.2.3 | The profile information related to the EAS in the EASRegistration data type. |  |
| EASServiceKPI | 8.y.5.2.4 | Service characteristics provided by EAS, captured in EAS profile information.  |  |
| EndPoint | 8.y.5.2.5 | The end point information of the Edge Application Server in the EAS profile. |  |

Table 8.y.5.1-2 specifies data types re-used by the Eees\_EASRegistration API service.

Table 8.y.5.1-2: Re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| SupportedFeatures | 3GPP TS 29.571 [r29571] | Used to negotiate the applicability of optional features defined in table 8.y.7-1. |  |
| DateTime | 3GPP TS 29.571 [r29571] | Used to capture the expiration time of EAS registration. |  |
| ScheduledCommunicationTime | 3GPP TS 29.571 [r29571] | Used to define the schedule of EAS availability.  |  |
| RouteToLocation | 3GPP TS 29.571 [r29571] | Used to define the DNAIs associated with EAS and the corresponding N6 routing information for each EAS DNAI. |  |
| DurationSec | 3GPP TS 29.571 [r29571] | Duration in seconds, used to define the availability reporting period for EES to check EAS availability.  |  |
| LocationArea5G | 3GPP TS 29.122 [r29122] | Used to defined the geographic and topological area served by EAS. |  |
| BitRate | 3GPP TS 29.571 [r29571] | Used to express the connection bandwidth of EAS service KPI. |  |
| Fqdn | 3GPP TS 29.510 [r29510] | Used to express the Fully Qualified Domain Name of the Edge Application server. |  |
| Ipv4Addr | 3GPP TS 29.571 [r29571] | Identifying the IPv4 address of the Edge Application Server. |  |
| Ipv6Addr | 3GPP TS 29.571 [r29571] | Identifying the IPv6 address of the Edge Application Server. |  |

#### 8.y.5.2 Structured data types

##### 8.y.5.2.1 Introduction

##### 8.y.5.2.2 Type: EASRegistration

Table 8.y.5.2.2-1: Definition of type EASRegistration

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| easProf | EASProfile | M | 1 | The profile information of the EAS.  |  |
| expTime | DateTime | O | 0..1 | Identifies the expiration time for the EAS registration. If the expiration time is not present, then it indicates that the registration of EAS never expires. |  |
| suppFeat | SupportedFeatures | O | 0..1 | Used to negotiate the supported optional features of the API as described in clause 7.8.This attribute shall be provided in the HTTP POST request and in the response of successful resource creation. |  |

Editor’s Note: The data model to be updated with security credentials information, based on security aspects defined by SA3.

##### 8.y.5.2.3 Type: EASProfile

Table 8.y.5.2.3-1: Definition of type EASProfile

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| easId | string | M | 1 | The identifier of the EAS |  |
| endPt | EndPoint | M | 1 | Endpoint information (URI, FQDN, IP address) used to communicate with the EAS. This information maybe discovered by EEC and exposed to ACs so that ACs can establish contact with the EAS. |  |
| acIds | array(string) | O | 1..N | Identities of the Application Clients that can be served by the EAS |  |
| provId | string | O | 0..1 | Identifier of the EAS provider |  |
| type | string | O | 0..1 | The category or type of EAS. |  |
| scheds | array(ScheduledCommunicationTime) | O | 1..N | The availability schedule of the EAS. |  |
| svcArea | LocationArea5G | O | 0..1 | The list of geographical and topological areas that the EAS serves. ACs in the UE that are outside the area shall not be served. |  |
| svcKpi | EASServiceKPI | O | 0..1 | Service characteristics provided by the EAS.  |  |
| permLvl | array(string) | O | 1..N | Level of service permissions supported by the EAS.  |  |
| easFeats | array(string) | O | 1..N | Service features supported by the EAS. |  |
| svcContSupp | boolean | O | 0..1 | Set to TRUE if the EAS supports service continuity and set to FALSE if the EAS does not support service continuity. Default value is FALSE if omitted. |  |
| appLocs | array(RouteToLocation) | O | 1..N | List of DNAI(s) and the corresponding N6 traffic routing information/routing profile ID, associated with the EAS.It is a subset of the DNAI(s) associated with the EDN where the EAS resides. |  |
| avlRep | DurationSec | O | 0..1 | The period indicating to the EES, how often the EES needs to check the EAS's availability after a successful registration. |  |
| svcApis | array(string) | O | 1..N | List of service APIs that are required by the EAS. |  |
| status | string | O | 0..1 | EAS status (e.g. Enabled, Disabled etc.) |  |

Editor’s Note: The definition of topological service area in svcArea attribute is FFS and needs alignment with stage 2.

Editor’s Note: The data type definitions for the attributes, type, permLvl, easFeats, svcApis, status are FFS.

##### 8.y.5.2.4 Type: EASServiceKPI

Table 8.y.5.2.4-1: Definition of type EASServiceKPI

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| maxReqRate | string | O | 0..1 | Maximum request rate from the Application Client supported by the EAS. |  |
| maxRespTime | Uinteger | O | 0..1 | The maximum response time, in the units of milliseconds, advertised for the AC’s service requests. This includes the round trip time of the request and response packet, the processing time at the EAS and time required by EAS to consume any 3GPP core network capabilities. |  |
| avail | string | O | 0..1 | Advertised percentage of time the server is available for the AC's use. |  |
| avlComp | string | O | 0..1 | The maximum compute resource available for the AC. |  |
| avlGraComp | string | O | 0..1 | The maximum graphical compute resource available for the AC. |  |
| avlMem | string | O | 0..1 | The maximum memory resource available for the AC. |  |
| avlStrg | string | O | 0..1 | The maximum storage resource available for the AC. |  |
| connBand | BitRate | O | 0..1 | The connection bandwidth in Kbit/s advertised for the AC's use. |  |

Editor’s Note: The data type definitions for the attributes in EASServiceKPI data type are FFS.

##### 8.y.5.2.5 Type: EndPoint

Table 8.y.5.2.5-1: Definition of type EndPoint

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| uri | Uri | O | 0..1 | URI information of the Edge server. (NOTE) |  |
| ipv4Addrs | array(Ipv4Addr) | O | 1..N | IPv4 addresses of the Edge server. (NOTE) |  |
| Ipv6Addrs | array(Ipv6Addr) | O | 1..N | IPv6 addresses of the Edge server. (NOTE) |  |
| Fqdn | Fqdn | O | 0..1 | Fully Qualified Domain Name of the Edge server. (NOTE) |  |
| NOTE: At least one of the addressing parameters (uri, ipv4Addrs, ipv6Addrs, fqdn attributes) shall be included. |

#### 8.y.5.3 Simple data types and enumerations

None.

### 8.y.6 Error Handling

General error responses are defined in clause 7.7.

### 8.y.7 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 8.y.7-1 lists the supported features for Eees\_EASRegistration API.

Table 8.y.7-1: Supported Features

|  |  |  |
| --- | --- | --- |
| **Feature number** | **Feature Name** | **Description** |
|  |  |  |

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