**3GPP TSG-CT WG1 Meeting #136-eC1-223666**

**E-Meeting, 12th – 20th May 2022**

**Source: Samsung, InterDigital**

**Title: Pseudo-CR to provide partial EEC REGISTER Update failure status**

**Spec: 3GPP TS 24.558**

**Agenda item: 17.2.16**

**Document for: Agreement**

**1. Introduction**

The pCR proposes changes to EEC Register, EEC Register Update procedure

**2. Reason for Change**

1. The pCR provides the changes related to EEC registration, EEC registration update procedure as per the accepted contribution S6-220878 to stage-2 and removes the below Editor’s note associated with this change.

Editor's note: How EES responds when a matching EAS is not identified for even one AC profile is FFS.

1. The pCR also removes below Editor’s Note, since eecCntxId is a global unique ID and shall not be replaced.

Editor's note: Whether eecCntxId can be replaced or not is FFS.

**3. Proposal**

It is proposed to agree the following changes to 3GPP TS 24.558 v1.3.0.

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

#### 5.2.2.2 Eees\_EECRegistration\_Request

##### 5.2.2.2.1 General

This service operation is used by EEC to register itself with a given EES.

##### 5.2.2.2.2 EEC registering to EES using Eees\_EECRegistration\_Request operation

For an EEC to register at the EES, the EEC shall send an HTTP POST message to the EES on the "EEC Registrations" collection resource to create the resource associated to or representing the EEC. The body of the HTTP POST message shall include the EEC ID, may include UE identifier, AC Profile(s), proposed expiration time for the registration, EEC context ID obtained from a previous registration, as specified in clause 6.2.2.2.3.1. If EEC context ID is included in the body of the HTTP POST message, it shall also include Source EES ID and Source EES Endpoint of the EES that provided EEC context ID.

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

a) Process the EEC registration request information;

b) verify if the EEC is authorized to register itself at EES; and

c) if the EEC is authorized to register with EES, then;

1) if the AC Profile(s) is included in the HTTP POST message, the EES further determines whether the registered EAS(s) fulfils the requirements that were indicated in the AC Profile(s):

i) if acSvcContSupp information is included in the AC Profile, the matching EAS 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 EES identifies the matching EAS such that the matching EAS shall:

A) be identified by the easId information; and

B) suffice all information included in the minimumReqSvcKPIs information.

NOTE 1: With respect to expectedSvcKPIs information, it is up to the EES implementation on how to identifies the matching EAS.

When a matching EAS is identified, the EES determines that the corresponding requirements are fulfilled and are supported for the new resource.

When a matching EAS is not identified for even one AC profile, the EES shall reject the request message by sending an HTTP response to the EEC with a status code set to 404 Not Found and indicate the "RESOURCE\_NOT\_FOUND" error in the "cause" attribute of the "ProblemDetails" structure.

2) if the received EEC registration request contains an EEC context ID, a source EES endpoint, the EES retrieves the EEC's context from the source EES according to the procedures specified in clause 5.10 of 3GPP TS 29.558 [4];

3) the EES creates a new resource with the EEC registration information as specified in clause 6.2.2.1, and assigns and stores new EEC context ID;

i) if 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 as specified in clause 6.2.2.2.3.1; and

ii) Otherwise the EES shall return the EEC registration information in the response message. The response message may include expiration time to indicate when the EEC registration will automatically expire. The response message may include a newly assigned EEC context ID. The URI of the created resource shall be returned in the "Location" HTTP header. If the EEC registration request contains AC Profile(s), and the EES determines that the requirements indicated in the AC profile(s) cannot be fulfilled for some of the AC profile(s), the EES shall include "unfulfilledAcProfs" attribute containing the list of ACIDs of such AC Profile(s) and appropriate reasons as specified in clause 6.2.5.2.2.

The EEC stores the new EEC context ID and uses it when it registers with another EES.

If the expiration time is provided, then to maintain the registration, the EEC shall send a registration update request (as described in clause 5.2.2.3) prior to the expiration time. If the registration update request is not received prior to the expiration time, then the EES shall treat the EEC as implicitly deregistered and remove the corresponding EEC registration resource.

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

#### 5.2.2.3 Eees\_EECRegistration\_Update

##### 5.2.2.3.1 General

This service operation is used by the EEC to update its registration information at the EES.

##### 5.2.2.3.2 EEC updating registration information using Eees\_EECRegistration\_Update operation

To update the EEC registration information at the EES, the EEC shall send an HTTP PATCH request (for partial update) or HTTP PUT message (for fully replacement) to the EES on resource URI identifying the Individual EEC registration resource representation as specified in clause 6.2.2.3.3.3 for an HTTP PATCH message or in clause 6.2.2.3.3.1 for an HTTP PUT message.

The PATCH message includes the parameters (AC profiles or proposed expiry time) that need to be replaced in the existing registration information.

The PUT message shall replace all properties of the existing resource with the EEC registration information in the request. The value of the eecId provided during the EEC registration shall not be changed.

Upon receiving the HTTP PATCH or PUT message from the EEC, if the resource URI does not exist, the EES shall respond 404 Not Found error to the EEC. Otherwise, the EES shall:

a) check the registration update message from the EEC to see if the EEC is authorized to modify the requested registration resource; and

b) if the EEC is authorized to update the registration information and the eecId information in the request and the resource match, then the EES shall;

1) if the AC Profile(s) is included in the HTTP PATCH or PUT message, the EES further determines whether the registered EAS(s) fulfils the requirements that were indicated in the AC Profile(s):

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

ii) For each AC Profile, if EAS(s) information is included in the AC Profile, the EES identifies the matching EAS such that the matching EAS shall:

A) be identified by the easId information; and

B) suffice all information included in the minimumReqSvcKPIs information.

NOTE 1: With respect to expectedSvcKPIs information, it is up to the EES implementation on how to identifies the matching EAS.

When a matching EAS is identified for atleast one AC profile, the EES determines that the corresponding requirements are fulfilled and are supported and shall update the resource identified by Resource URI of the EEC registration information with the updated EEC registration information received in the HTTP PATCH or PUT request message.

2) return the updated EEC registration information in the response. In the response message, the EES may send "200 OK" response code to provide an updated expiration time to indicate to the EEC when the updated registration will automatically expire. Otherwise, the EES sends "204 No Content" response code. If the EEC registration request contains AC Profile(s), and the EES determines that the requirements indicated in the AC profile(s) cannot be fulfilled for some of the AC profile(s), the EES shall include "unfulfilledAcProfs" attribute containing the list of ACIDs of such AC Profile(s) and appropriate reasons as specified in clause 6.2.5.2.2.

If the expiration time is provided, the EEC shall send a registration update request prior to the expiration time if the EEC wants to maintain the registration. If a registration update request is not received prior to the expiration time, the EES shall treat the EEC as implicitly de-registered and remove the corresponding EEC registration resource.

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

##### 6.2.5.2.2 Type: EecRegistration

Table 6.2.5.2.2-1: Definition of type EecRegistration

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 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 | Profiles of ACs for which the EEC provides edge enabling services. |  |
| eecSvcContSupp | array(ACRScenario) | O | 0..1 | The ACR scenarios supported by the EEC for service continuity. If this attribute is not present, then the EEC does not support service continuity. |  |
| expTime | DateTime | O | 0..1 | Represents an expiration time for the registration.  This attribute shall be present in the response of the HTTP POST message from EEC to create a new registration or in the response of the HTTP PUT message from EEC to update a specific registration.  If abesent, then it indicates that the registration of EEC never expires. |  |
| eecCntxId | string | O | 0..1 | Identifier of the EEC context obtained from a previous registration. |  |
| srcEesId | string | O | 0..1 | Identifier of the EES that provided EEC context ID. |  |
| srcEesEndpoint | EndPoint | O | 0..1 | The endpoint address of the EES that provided EEC context ID. |  |
| unfulfilledAcProfs | array(UnfulfilledAcProfile) | O | 1..N | Represents the list of ACIDs of the AC Profile(s) sent from EES, for which the requirements indicated in the AC profile(s) cannot be fulfilled as shared in reason |  |

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

##### 6.2.5.2.6 Type: EecRegistrationPatch

Table 6.2.5.2.6-1: Definition of type EecRegistrationPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| acProfs | array(ACProfile) | O | 1..N | Profiles of ACs for which the EEC provides edge enabling services. |  |
| expTime | DateTime | O | 0..1 | Represents an expiration time for the registration. |  |
| unfulfilledAcProfs | array(UnfulfilledAcProfile) | O | 1..N | Represents the list of ACIDs of the AC Profile(s) sent from EES, for which the requirements indicated in the AC profile(s) cannot be fulfilled as shared in reason |  |

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

##### 6.2.5.2.7 Type: UnfulfilledAcProfile

Table 6.2.5.2.7-1: Definition of type UnfulfilledAcProfile

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| acId | string | M | 0..1 | The list of identifier of the AC profile |  |
| reason | UnfulfillACProfRsn | O | 0..1 | Reason indicating the cause (e.g. EAS not available, requirements cannot be fulfilled) |  |

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

#### 6.2.5.3 Simple data types and enumerations

##### 6.2.5.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

##### 6.2.5.3.2 Simple data types

The simple data types defined in table 6.2.5.3.2-1 shall be supported.

Table 6.2.5.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

##### 6.2.5.3.3 Enumeration: UnfulfillACProfRsn

The enumeration UnfulfillACProfRsn represents the reasons for AC profile failure during EEC Registration. It shall comply with the provisions defined in table 6.2.5.3.3-1.

Table 6.2.5.3.3-1: Enumeration UnfulfillACProfRsn

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| EAS\_NOT\_AVAILABLE | EAS not available |  |
| REQ\_UNFULFILLED | Requirements cannot be fulfilled |  |

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

## A.2 Eees\_EECRegistration

openapi: 3.0.0

info:

title: Eees\_EECRegistration

description: |

API for EEC registration.

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version: "1.0.0-alpha.3"

externalDocs:

description: 3GPP TS 24.558 V1.3.0 Enabling Edge Applications; Protocol specification.

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

security:

- {}

- oAuth2ClientCredentials: []

servers:

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

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.1 of 3GPP TS 24.558

paths:

/registrations:

post:

description: Create a new EEC registration at the EES.

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'201':

description: Created (EEC information is registered successfully at EES)

content:

application/json:

schema:

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

'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'

/registrations/{registrationId}:

put:

description: Update an existing EEC registration a the EES.

parameters:

- name: registrationId

in: path

description: Identifies an individual EEC registration

required: true

schema:

type: string

requestBody:

description: Parameters to replace the existing registration

required: true

content:

application/json:

schema:

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

responses:

'200':

description: OK (An individual EEC registration resource updated successfully)

content:

application/json:

schema:

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

'204':

description: No Content (An individual EEC registration resource updated 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'

'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: Remove an existing ECC registration at EES.

parameters:

- name: registrationId

in: path

description: Identifies an individual EEC registration

required: true

schema:

type: string

responses:

'204':

description: No Content (An individual EEC registration 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: partially update an existing EEC registration a the EES.

parameters:

- name: registrationId

in: path

description: Identifies an individual EEC registration

required: true

schema:

type: string

requestBody:

description: Parameters to replace the existing registration

required: true

content:

application/json:

schema:

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

responses:

'200':

description: OK (An individual EEC registration resource updated successfully)

content:

application/json:

schema:

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

'204':

description: No Content (An individual EEC registration resource updated 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'

'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:

EECRegistration:

description: Describes the parameters to perform EEC Registration related operations.

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: '#/components/schemas/ACProfile'

description: Profiles of ACs for which the EEC provides edge enabling services.

expTime:

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

eecSvcContSupp:

type: array

items:

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

description: Profiles of ACs for which the EEC provides edge enabling services.

eecCntxId:

type: string

description: Identifier of the EEC context obtained from a previous registration.

srcEesId:

type: string

description: Identifier of the EES that provided EEC context ID.

endPt:

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

unfulfilledAcProfs:

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

required:

- eecId

ACProfile:

description: ECS service provisioning response information.

type: object

properties:

acId:

type: string

description: Identity of the AC.

acType:

type: string

description: The category or type of AC.

prefEcsps:

type: array

items:

type: string

description: Indicates to the ECS which ECSPs are preferred for the AC.

acSchedule:

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

expAcGeoServArea:

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

acSvcContSupp:

type: array

items:

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

description: Profiles of ACs for which the EEC provides edge enabling services.

eass:

type: array

items:

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

minItems: 1

description: List of EAS information.

required:

- acId

EasDetail:

description: EAS details.

type: object

properties:

easId:

type: string

description: Identifier of the EAS.

expectedSvcKPIs:

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

minimumReqSvcKPIs:

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

required:

- easId

ACServiceKPIs:

description: EAS details.

type: object

properties:

connBand:

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

reqRate:

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

respTime:

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

avail:

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

reqComp:

type: string

description: The compute resources required by the AC.

reqGrapComp:

type: string

description: The graphical compute resources required by the AC.

reqMem:

type: string

description: The memory resources required by the AC.

reqStrg:

type: string

description: The storage resources required by the AC.

EECRegistrationPatch:

description: Describes the parameters to perform EEC Registration update.

type: object

properties:

acProfs:

type: array

items:

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

description: Profiles of ACs for which the EEC provides edge enabling services.

expTime:

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

unfulfilledAcProfs:

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

UnfulfilledAcProfile:

description: Desrcibes AC Profile ID and reason sent by EES in EEC Register response.

type: object

properties:

acId:

type: string

description: The AC ID of a AC profile.

reason:

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

UnfulfillACProfRsn:

anyOf:

- type: string

enum:

- EAS\_NOT\_AVAILABLE

- REQ\_UNFULFILLED

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