**3GPP TSG-CT3 Meeting #138 *C3-246196***

**Orlando, United States, 18th Nov 2024 - 22nd Nov 2024**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.591** | **CR** | **0222** | **rev** | **-** | **Current version:** | **19.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
|  | | | | | | | | |

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

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | N6 delay measurement support in EAS Deployment information | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | |  |
|  | *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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | S2-2410711 extended the EAS Deployment information to contain “N6 delay measurement assistance information”. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | N6 delay measurement assistance information is added to the EAS Deployment information. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Not fulfilled stage 2 requirements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2.6.1, 5.2.6.2.5, 5.2.8, A.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 23.548 CR 0252 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR introduces a backwards compatible feature into the OpenAPI file of the Nnef\_EASDeployment API. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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

5.2.6.1 General

This clause specifies the application data model supported by the API.

Table 5.2.6.1-1 specifies the data types defined for the Nnef\_EASDeployment service based interface protocol.

**Table 5.2.6.1-1: Nnef\_EASDeployment specific Data Types**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **Section defined** | **Description** | **Applicability** |
| EasDeployInfoNotif | 5.2.6.2.3 | Represents notifications on EAS Deployment Information changes event(s) that occurred for an Individual EAS Deployment Event Subscription resource. |  |
| EasDeploySubData | 5.2.6.2.2 | Represents EAS Deployment Information changes event(s) subscription data. |  |
| EasDeployInfoData | 5.2.6.2.5 | Represents the EAS Deployment Information to be reported. |  |
| EasDepNotification | 5.2.6.2.4 | Represents the EAS Deployment Notifcation. |  |
| EasEvent | 5.2.6.3.3 | represents the EAS event. |  |

Table 5.2.6.1-2 specifies data types re-used by the Nnef\_EASDeployment service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nnef\_EASDeployment service based interface.

**Table 5.2.6.1-2: Nnef\_EASDeployment re-used Data Types**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Data type** | | **Reference** | | **Comments** | | **Applicability** | |
| DnaiInformation | | 3GPP TS 29.522 [15] | | Represents the DNAI inormation including the DNS server identifier (consisting of IP address and port) and/or IP address(s) of the EAS in the local DN for the DNAI. | |  | |
| DnnSnssaiInformation | | 3GPP TS 29.522 [15] | | Identifies a combination of (DNN, S-NSSAI). | |  | |
| FqdnPatternMatchingRule | | 3GPP TS 29.571 [16] | | Represents the FQDN pattern matching rule. | |  | |
| GroupId | | 3GPP TS 29.571 [16] | | Contains a Group identifier. | |  | |
| N6DelayPerDnai | | 3GPP TS 29.522 [15] | | Represents N6 delay measurement assistance information per DNAI. | | N6DelayMeasurement | |
| N6DelayPerEas | | 3GPP TS 29.522 [15] | | Represents N6 delay measurement assistance information per EAS. | | N6DelayMeasurement | |
| RedirectResponse | | 3GPP TS 29.571 [16] | | Contains redirection related information. | |  | |
| Uri | | 3GPP TS 29.571 [16] | | Contains a URI. | |  | |

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

5.2.6.2.5 Type: EasDeployInfoData

**Table 5.2.6.2.5-1: Definition of type EasDeployInfoData**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| appId | string | O | 0..1 | Identifies the application for which the EAS Deployment Information corresponds to. |  |
| dnaiInfos | map(DnaiInformation) | O | 1..N | list of DNS server identifier (consisting of IP address and port) and/or IP address(s) of the EAS in the local DN for each DNAI. The key of map is the DNAI. |  |
| dnn | Dnn | O | 0..1 | DNN for the EAS Deployment Information. |  |
| fqdnPatternList | array(FqdnPatternMatchingRule) | M | 1..N | Supported FQDN pattern(s) for application(s) deployed in the Local part of the DN where each FQDN pattern is described by a FQDN Pattern Matching Rule. |  |
| internalGroupId | GroupId | O | 0..1 | Internal Group ID for the EAS Deployment Information. |  |
| snssai | Snssai | O | 0..1 | S-NSSAI for the EAS Deployment Information. |  |
| targetAfId | string | O | 0..1 | Identifier of the AF that is responsible for the EAS associated with this EAS deployment information. | EasRelocationEnh |
| n6DelayPerDnai | map(N6DelayPerDnai) | O | 1..N | Contains N6 delay measurement assistance information per DNAI. The key of the Map is the "dnai" attribute of the N6DelayPerDnai data type. | N6DelayMeasurement |
| n6DelayPerEas | map(N6DelayPerEas) | O | 1..N | Contains N6 delay measurement assistance information per EAS. The key of the Map is the "eas" attribute of the N6DelayPerEas data type. | N6DelayMeasurement |

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

5.2.8 Feature negotiation

The optional features in table 5.2.8-1 are defined for the Nnef\_EASDeployment API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

**Table 5.2.8-1: Supported Features**

|  |  |  |
| --- | --- | --- |
| **Feature number** | **Feature Name** | **Description** |
| 1 | EasRelocationEnh | This feature indicates enhanced support of EAS relocation procedures via additional information about the AFs that are responsible for certain EAS. |
| 2 | N6DelayMeasurement | This feature indicates support of provisioning N6 delay measurement assistance information. |

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

A.3 Nnef\_EASDeployment API

openapi: 3.0.0

info:

title: Nnef\_EASDeployment

version: 1.1.0

description: |

NEF EAS Deployment service.

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externalDocs:

description: >

3GPP TS 29.591 V18.6.0; 5G System; Network Exposure Function Southbound Services; Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.591/

servers:

- url: '{apiRoot}/nnef-eas-deployment/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

security:

- {}

- oAuth2ClientCredentials:

- nnef-eas-deployment

paths:

/subscriptions:

post:

summary: subscribe to notifications

operationId: CreateIndividualSubcription

tags:

- Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'201':

description: Success

content:

application/json:

schema:

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

headers:

Location:

description: >

Contains the URI of the newly created resource, according to the structure:

{apiRoot}/nnef-eas-deployment/<apiVersion>/subscriptions/{subscriptionId}.

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

callbacks:

notifUri:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'204':

description: No Content, Notification was succesfull

'307':

$ref: 'TS29571\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29571\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:

get:

summary: retrieve subscription

operationId: GetIndividualSubcription

tags:

- IndividualSubscription (Document)

parameters:

- name: subscriptionId

in: path

description: Event Subscription ID

required: true

schema:

type: string

responses:

'200':

description: OK. Resource representation is returned

content:

application/json:

schema:

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

'307':

$ref: 'TS29571\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29571\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29571\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

delete:

summary: unsubscribe from notifications

operationId: DeleteIndividualSubcription

tags:

- IndividualSubscription (Document)

parameters:

- name: subscriptionId

in: path

description: Event Subscription ID

required: true

schema:

type: string

responses:

'204':

description: No Content. Resource was succesfully deleted

'307':

$ref: 'TS29571\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29571\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'502':

$ref: 'TS29571\_CommonData.yaml#/components/responses/502'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{nrfApiRoot}/oauth2/token'

scopes:

nnef-eas-deployment: Access to the Nnef\_EASDeployment API

schemas:

EasDeploySubData:

description: Represents an Individual EAS Deployment Event Subscription resource.

type: object

properties:

appId:

type: string

dnnSnssaiInfos:

type: array

items:

$ref: 'TS29522\_AMInfluence.yaml#/components/schemas/DnnSnssaiInformation'

minItems: 1

description: Each of the element identifies a (DNN, S-NSSAI) combination.

eventId:

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

eventsNotifs:

type: array

items:

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

minItems: 1

description: >

Represents the EAS Deployment Information changes event(s) to be reported.

Shall only be present if the "immRep" attribute is included and sets to true,

and the current status of EAS Deployment Information is available.

immRep:

type: boolean

description: >

Indication of immediate reporting. Set to true: requires the immediate reporting of the

current status of EAS Deployment Information, if available. Set to false (default): EAS

Deployment Information event report occurs when the event is met.

interGroupId:

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

notifId:

type: string

notifUri:

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

required:

- eventId

- notifId

- notifUri

EasDeployInfoNotif:

description: >

Represents notifications on EAS Deployment Information changes event(s) that occurred for an

Individual EAS Deployment Event Subscription resource.

type: object

properties:

easDepNotifs:

type: array

items:

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

minItems: 1

notifId:

type: string

required:

- easDepNotifs

- notifId

EasDepNotification:

description: Represents the EAS Deployment Notifcation.

type: object

properties:

easDepInfo:

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

eventId:

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

required:

- easDepInfo

- eventId

EasDeployInfoData:

description: Represents the EAS Deployment Information to be reported.

type: object

properties:

appId:

type: string

dnaiInfos:

type: object

additionalProperties:

$ref: 'TS29522\_EASDeployment.yaml#/components/schemas/DnaiInformation'

minProperties: 1

description: >

list of DNS server identifier (consisting of IP address and port) and/or IP address(s)

of the EAS in the local DN for each DNAI. The key of map is the DNAI.

dnn:

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

fqdnPatternList:

type: array

items:

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

minItems: 1

internalGroupId:

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

snssai:

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

targetAfId:

type: string

description: >

Identifier of the AF that is responsible for the EAS associated with this EAS

deployment information.

n6DelayPerDnai:

type: object

additionalProperties:

$ref: 'TS29522\_EASDeployment.yaml#/components/schemas/N6DelayPerDnai'

minProperties: 1

description: >

N6 delay measurement assistance information per DNAI.

The key of the Map is the dnai attribute of the N6DelayPerDnai data type.

n6DelayPerEas:

type: object

additionalProperties:

$ref: 'TS29522\_EASDeployment.yaml#/components/schemas/N6DelayPerEas'

minProperties: 1

description: >

N6 delay measurement assistance information per EAS.

The key of the Map is the eas attribute of the N6DelayPerEas data type.

required:

- fqdnPatternList

# Simple data types and Enumerations

EasEvent:

anyOf:

- type: string

enum:

- EAS\_INFO\_CHG

- type: string

description: |

Represents the EAS event.

Possible values are：

- EAS\_INFO\_CHG: Indicates that the EAS Deployment Information is changed.

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