**3GPP TSG-CT WG3 Meeting #128 *C3-232176***

**Bratislava, Slovakia, 22nd - 26th May, 2023 (revision of C3-232abc)**

|  |
| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **29.591** | **CR** | **0131** | **rev** | **-** | **Current version:** | **18.1.0** |  |
|  |
| *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:***  | Definition of resource and data model for the new Nnef\_ECSAddress API |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | EDGE\_Ph2 |  | ***Date:*** | 2023-05-10 |
|  |  |  |  |  |
| ***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 canbe 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:*** | As indicated in S2-2306217, a new service ECSAddress was added for NEF to support V-SMF subscribe AF request from V-NEF. This paper proposes to define the OpenAPI file for the ECSAddress service. |
|  |  |
| ***Summary of change:*** | Define the resource and data models for the ECSAddress service. |
|  |  |
| ***Consequences if not approved:*** | AF deployed in the VPLMN provides the ECS Address Configuration Information to the V-SMF is not supported. |
|  |  |
| ***Clauses affected:*** | 5.4(new) |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS/TR 23.502 CR 4062  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | The CR introduces a new OpenAPI file for ECSAddress API. |
|  |  |
| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

**Proposed changes:**

\*\*\* 1st Change \*\*\*

## 5.4 ECSAddress Service API

### 5.4.1 Introduction

The ECSAddress service shall use the ECSAddress API.

The API URI of the ECSAddress API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests from the NF service consumer towards the NF service producer shall have the Resource URI structure defined in clause 4.4.1 of 3GPP TS 29.501 [5], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>**

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [5].

- The <apiName>shall be "nnef-ecs-addr-cfg-info".

- The <apiVersion> shall be "v1".

- The <apiSpecificResourceUriPart> shall be set as described in clause 5.4.3.

### 5.4.2 Usage of HTTP

#### 5.4.2.1 General

HTTP/2, IETF RFC 7540 [11], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

HTTP/2 shall be transported as specified in clause 5.4 of 3GPP TS 29.500 [4].

The OpenAPI [6] specification of HTTP messages and content bodies for the ECSAddress API is contained in Annex 4.

#### 5.4.2.2 HTTP standard headers

##### 5.4.2.2.1 General

See clause 5.4.2 of 3GPP TS 29.500 [4] for the usage of HTTP standard headers.

##### 5.4.2.2.2 Content type

JSON, IETF RFC 8259 [12], shall be used as content type of the HTTP bodies specified in the present specification as specified in clause 5.4 of 3GPP TS 29.500 [4]. The use of the JSON format shall be signalled by the content type "application/json".

"Problem Details" JSON object shall be used to indicate additional details of the error in a HTTP response body and shall be signalled by the content type "application/problem+json", as defined in IETF RFC 7807 [13].

#### 5.4.2.3 HTTP custom headers

The ECSAddress API shall support mandatory HTTP custom header fields specified in clause 5.4.3.2 of 3GPP TS 29.500 [4] and may support HTTP custom header fields specified in clause 5.4.3.3 of 3GPP TS 29.500 [4].

In this Release of the specification, no specific custom headers are defined for the ECSAddress API.

### 5.4.3 Resources

#### 5.4.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 5.4.3.1-1 depicts the resource URIs structure for the ECSAddress API.



Figure 5.4.3.1-1: Resource URI structure of the ECSAddress API

Table 5.4.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 5.4.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| ECS Address Configuration Information Subscriptions | /subscriptions | POST | Creates a subscription to notifications of ECS Address Configuration Information, i.e. creation of an Individual ECS Address Configuration Information Subscription resource. |
| Individual ECS Address Configuration Information Subscription | /subscriptions/{subscriptionId} | PUT | Modify all of the properties of an existing subscription to ECS Address Configuration Information. |
| GET | Reads a subscription to Individual ECS Address Configuration Information. |
| DELETE | Cancels an individual subscription to notifications of ECS Address Configuration Information. |

#### 5.4.3.2 Resource: ECS Address Configuration Information Subscriptions

##### 5.4.3.2.1 Description

The resource represents the collection of ECS Address Configuration Information subscriptions of the ECSAddress service. It allows NF service consumers to create a new subscription to notifications on ECS Address Configuration Information.

##### 5.4.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nnef-ecs-addr-cfg-info/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in table 5.4.3.2.2-1.

Table 5.4.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.4.1 |

##### 5.4.3.2.3 Resource Standard Methods

###### 5.4.3.2.3.1 POST

This method shall support the URI query parameters specified in table 5.4.3.2.3.1-1.

Table 5.4.3.2.3.1-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 5.4.3.2.3.1-2 and the response data structures and response codes specified in table 5.4.3.2.3.1-3.

Table 5.4.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| EcsAddrCfgInfoSub | M | 1 | Contains the information required for the creation of a new Individual ECS Address Configuration Information Subscription resource. |

Table 5.4.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | ResponseCodes | Description |
| EcsAddrCfgInfoSub | M | 1 | 201 Created | Contains the representation of the Individual ECS Address Configuration Information Subscription resource. |
| NOTE: The mandatory HTTP error status code for the POST method listed in table 5.4.7.1-1 of 3GPP TS 29.500 [4] also apply. |

Table 5.4.3.2.3.1-4: 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}/nnef-ecs-addr-cfg-info/<apiVersion>/subscriptions/{subscriptionId} |

#### 5.4.3.3 Resource: Individual ECS Address Configuration Information Subscription

##### 5.4.3.3.1 Description

The resource represents an individual ECS Address Configuration Information subscription of the ECSAddress service. It allows NF service consumers to subscribe/unsubscribe an ECS Address Configuration Information, and allows the NEF to notify ECS Address Configuration Information to the NF service consumer.

##### 5.4.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nnef-ecs-addr-cfg-info/<apiVersion>/subscriptions/{subscriptionId}**

This resource shall support the resource URI variables defined in table 5.4.3.3.2-1.

Table 5.4.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.4.1 |
| subscriptionId | string | Identifier of the subscription. |

##### 5.4.3.3.3 Resource Standard Methods

###### 5.4.3.3.3.1 GET

This method shall support the URI query parameters specified in table 5.4.3.3.3.1-1.

Table 5.4.3.3.3.1-1: 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 5.4.3.3.3.1-2 and the response data structures and response codes specified in table 5.4.3.3.3.1-3.

Table 5.4.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 5.4.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| EcsAddrCfgInfoSub | M | 1 | 200 OK | The subscription information is returned. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during subscription retrieval.(NOTE 2) |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during subscription retrieval.(NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the GET method listed in table 5.4.7.1-1 of 3GPP TS 29.500 [4] also apply.NOTE 2: The RedirectResponse data structure may be provided by an SCP (cf. clause 6.10.9.1 of 3GPP TS 29.500 [4]). |

Table 5.4.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NEF (service) instance towards which the request is redirected. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NEF (service) instance towards which the request is redirected.For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |

Table 5.4.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NEF (service) instance towards which the request is redirected.For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NEF (service) instance towards which the request is redirected. |

###### 5.4.3.3.3.2 PUT

This method shall support the URI query parameters specified in table 5.4.3.3.3.2-1.

Table 5.4.3.3.3.2-1: 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 5.4.3.3.3.2-2 and the response data structures and response codes specified in table 5.4.3.3.3.2-3.

Table 5.4.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| EcsAddrCfgInfoSub | M | 1 | Modify an existing subscription to ECS Address Configuration Information. |

Table 5.4.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| EcsAddrCfgInfoSub | M | 1 | 200 OK | The subscription was updated successfully. |
| n/a |  |  | 204 No Content | The subscription has been successfully updated and no content is returned in the response body. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during subscription retrieval.(NOTE 2) |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during subscription retrieval.(NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the PUT method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.NOTE 2: The RedirectResponse data structure may be provided by an SCP (cf. clause 6.10.9.1 of 3GPP TS 29.500 [4]). |

Table 5.4.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NEF (service) instance towards which the request is redirected. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NEF (service) instance towards which the request is redirected.For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |

Table 5.4.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NEF (service) instance towards which the request is redirected.For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NEF (service) instance towards which the request is redirected. |

###### 5.4.3.3.3.3 DELETE

This method shall support the URI query parameters specified in table 5.4.3.3.3.3-1.

Table 5.4.3.3.3.3-1: 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 5.4.3.3.3.3-2 and the response data structures and response codes specified in table 5.4.3.3.3.3-3.

Table 5.4.3.3.3.3-2: Data structures supported by the DELETE Request Body on this resource

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

Table 5.4.3.3.3.3-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Individual ECS Address Configuration Information Subscription resource matching the subscriptionId was deleted. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during subscription termination.(NOTE 2) |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during subscription termination.(NOTE 2) |
| NOTE 1: The mandatory HTTP error status code for the DELETE method listed in table 5.4.7.1-1 of 3GPP TS 29.500 [4] also apply.NOTE 2: The RedirectResponse data structure may be provided by an SCP (cf. clause 6.10.9.1 of 3GPP TS 29.500 [4]). |

Table 5.4.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative NEF (service) instance towards which the request is redirected.For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NEF (service) instance towards which the request is redirected. |

Table 5.4.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative NEF (service) instance towards which the request is redirected.For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NEF (service) instance towards which the request is redirected. |

### 5.4.4 Custom Operations without associated resources

None.

### 5.4.5 Notifications

#### 5.4.5.1 General

Notifications shall comply to clause 6.2 of 3GPP TS 29.500 [4] and clause 4.6.2.3 of 3GPP TS 29.501 [5].

Table 5.4.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description(service operation) |
| Event Notification | {notifUri} | POST | Provides ECS Address Configuration Information. |

#### 5.4.5.2 ECS Address Configuration Information Notification

##### 5.4.5.4.1 Description

The ECS Address Configuration Information Notification is used by the NEF to report the observed ECS Address Configuration Information to an NF service consumer that has subscribed to such Notifications.

##### 5.4.5.4.2 Target URI

The Notification URI **"{notifUri}"** shall be used with the callback URI variables defined in table 5.4.5.4.2-1.

Table 5.4.5.4.2-1: Callback URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | The Notification URI as assigned by the NF service consumer during the subscription service operation and described within the TrafficInfluDataSub data type. |

##### 5.4.5.4.3 Standard Methods

###### 5.4.5.4.3.1 POST

This method shall support the request data structures specified in table 5.4.5.4.3.1-1 and the response data structures and response codes specified in table 5.4.5.4.3.1-2.

Table 5.4.5.4.3.1-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| EcsAddrCfgInfoNotification | M | 1 | Provides the ECS Address Configuration Information. |

Table 5.4.5.4.3.1-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | The receipt of the Notification is acknowledged. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during notification.(NOTE 2) |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during notification.(NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the POST method listed in table 5.4.7.1-1 of 3GPP TS 29.500 [4] also apply.NOTE 2: The RedirectResponse data structure may be provided by an SCP (cf. clause 6.10.9.1 of 3GPP TS 29.500 [4]). |

Table 5.4.5.4.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification should be redirected.For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the notification request is redirected. |

Table 5.4.5.4.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification should be redirected.For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [4]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the notification request is redirected. |

### 5.4.6 Data Model

#### 5.4.6.1 General

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

Table 5.4.6.1-1 specifies the data types defined for the ECSAddress service based interface protocol.

Table 5.4.6.1-1: ECSAddress specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| EcsAddrCfgInfoNotification | 5.4.6.2.3 | Contains ECS Address Configuration Information for notification. |  |
| EcsAddrCfgInfoSub | 5.4.6.2.2 | Contains ECS Address Configuration Information subscription data. |  |

Table 5.4.6.1-2 specifies data types re-used by the ECSAddress 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 ECSAddress service based interface.

Table 5.4.6.1-2: ECSAddress re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| Dnn | 3GPP TS 29.571 [16] | Identifies the DNN. |  |
| GroupId | 3GPP TS 29.571 [16] | Identifies a group of UEs. |  |
| ReportingInformation | 3GPP TS 29.523 [22] | Represents the type of reporting the subscription requires. |  |
| Snssai | 3GPP TS 29.571 [16] | Identifies a Single Network Slice Selection Assistance Information. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Indicates the features supported. |  |
| Uri | 3GPP TS 29.571 [16] | Contains a URI. |  |

#### 5.4.6.2 Structured data types

##### 5.4.6.2.1 Introduction

This clause defines the structures to be used in resource representations.

##### 5.4.6.2.2 Type: EcsAddrCfgInfoSub

Table 5.4.6.2.2-1: Definition of type EcsAddrCfgInfoSub

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| notifUri | Uri | M | 1 | URI provided by the NF service consumer indicating where to receive the subscribed notifications from the NEF. |  |
| notifCorrId | string | M | 1 | Notification correlation identifier. |  |
| dnns | array(Dnn) | O | 1..N | Each element identifies a DNN. |  |
| snssais | array(Snssai) | O | 1..N | Each element identifies an interna slice.  |  |
| internalGroupIds | array(GroupId) | O | 1..N | Each element identifies a group of users.  |  |
| immRepInd | boolean | O | 0..1 | Indication of immediate reporting. If included, when it is set to true it indicates immediate reporting of the subscribed events, if available. Otherwise, reporting will occur when the event is met. |  |
| immReports | array(EcsAddrCfgInfoNotification) | O | 1..N | Contains the ECS Address Configuration Information that match this subscription.It may be included only in the POST (or PUT) response body of a subscription creation (or modification), and only if the "immRepInd" attribute is set to "true". |  |
| supportedFeatures | SupportedFeatures | C | 0..1 | Used to negotiate the applicability of the optional features. This attribute shall be provided in the POST request and in the response of successful resource creation. |  |

Editor's note: Whether the "dnns", "snssais" and "internalGroupIds" attributes are single or plural is FFS.

##### 5.4.6.2.3 Type: EcsAddrCfgInfoNotification

Table 5.4.6.2.3-1: Definition of type EcsAddrCfgInfoNotification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| notifCorrId | string | M | 1 | Notification correlation identifier. |  |
| ecsAddrCfgInfo | array(string) | M | 1..N | Contains the ECS Address Configuration Information. |  |

Editor's note: The data type of "ecsAddrCfgInfo" attribute is FFS.

#### 5.4.6.3 Simple data types and enumerations

##### 5.4.6.3.1 Introduction

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

##### 5.4.6.3.2 Simple data types

The simple data types defined in table 5.4.6.3.2-1 shall be supported.

Table 5.4.6.3.2-1: Simple data types

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

### 5.4.7 Error Handling

#### 5.4.7.1 General

For the ECSAddress API, HTTP error responses shall be supported as specified in clause 4.8 of 3GPP TS 29.501 [5]. Protocol errors and application errors specified in table 5.4.7.2-1 of 3GPP TS 29.500 [4] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.4.7.1-1 of 3GPP TS 29.500 [4].

In addition, the requirements in the following clauses are applicable for the ECSAddress API.

#### 5.4.7.2 Protocol Errors

No specific procedures for the ECSAddress service are specified.

#### 5.4.7.3 Application Errors

The application errors defined for the ECSAddress service are listed in Table 5.4.7.3-1.

Table 5.4.7.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
|  |  |  |

### 5.4.8 Feature negotiation

The optional features in table 5.4.8-1 are defined for the ECSAddress API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

Table 5.4.8-1: Supported Features

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

### 5.4.9 Security

As indicated in 3GPP TS 33.501 [8] and 3GPP TS 29.500 [4], the access to the ECSAddress API may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [9]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [10]) plays the role of the authorization server.

If OAuth2 is used, an NF Service Consumer, prior to consuming services offered by the ECSAddress API, shall obtain a "token" from the authorization server, by invoking the Access Token Request service, as described in 3GPP TS 29.510 [10], clause 5.4.2.2.

NOTE: When multiple NRFs are deployed in a network, the NRF used as authorization server is the same NRF that the NF Service Consumer used for discovering the ECSAddress service.

The ECSAddress API defines a single scope "nnef-ecs-addr-cfg-info" for the entire service, and it does not define any additional scopes at resource or operation level.

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