**3GPP TSG CT WG3 Meeting #137 *C3-245075***

**Hefei, CN, 14 - 18 October, 2024**

|  |
| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** | **0362** | **rev** | **-** | **Current version:** |  |  |
|  |
| *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:***  | RNAA OAuth grant types provisioning in the CAPIF\_Publish\_Service\_API |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | SNAAPP |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | **A** |  | ***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 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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | In Release-18, the RNAA functionality was defined in CAPIF\_Security\_API that enabled RNAA OAuth grant types (i.e., see OAuthGrantType enumeration).According to requirements in TS 33.122:For selecting the authorization method, the procedure as specified in clause 6.3.1.2 is used with the following RNAA specific additions. The API invoker shall include in the Security Method Request the supported RNAA authorization flows. *The CCF shall determine the RNAA authorization flow based on the RNAA capabilities of the CCF, AEF, and API invoker*. The API invoker shall use the determined RNAA authorization flow in the subsequent communication with the CCF and AEF.However, the provisioning of RNAA capabilities of the AEF was not specified in Release-18 that may cause interoperability issues, i.e., the CCF cannot determine the supported RNAA OAuth grant types of the AEF due to absence of the provisioning. |
|  |  |
| ***Summary of change:*** | This CR enables provisioning of the RNAA OAuth grant types in the CAPIF\_Publish\_Service\_API to support CCF in determination the RNAA authorization flow based on the RNAA capabilities of the CCF, AEF, and API invoker. |
|  |  |
| ***Consequences if not approved:*** | The AEF cannot indicate to the CCF the supported OAuth grant types that creates misoperation of the RNAA functionality defined in Release-18. |
|  |  |
| ***Clauses affected:*** | 8.2.4.1, 8.2.4.2.3, 8.2.4.2.4, 8.2.6, A.3 |
|  |  |
|  | **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 provides backwards compatible correction of the CAPIF\_Publish\_Service\_API.
 |
| ***()*** |  |
| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

The impelemented in Release-18 RNAA functionality in the CAPIF\_Security\_API supports the token generation with RNAA capabilities (RNAA OAuth grant types (i.e., see OAuthGrantType enumeration)). However, the CAPIF\_Security\_API require information about the AEF RNAA capabilities that is not provisioned in the CAPIF\_Publish\_Service\_API. This contradiction blocks the RNAA capability of the CAPIF\_Security\_API, i.e., if AEF did not provisioned RNAA capabilities in CAPIF\_Publish\_Service\_API, the token with RNAA capabilities cannot be generated in CAPIF\_Security\_API.

Thus, this is FASMO issue that blocks the RNAA capability for CAPIF and shall be corrected in Release-18.

**Proposed changes:**

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

#### 8.2.4.1 General

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

Table 8.2.4.1-1 specifies the data types defined specifically for the CAPIF\_Publish\_Service\_API service.

Table 8.2.4.1-1: CAPIF\_Publish\_Service\_API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| ApiStatus | Clause 8.2.4.2.12 | Represents the API status. | ApiStatusMonitoring |
| AefLocation | Clause 8.2.4.2.10 | Represents the location information (e.g. civic address, GPS coordinates, data center ID) where the AEF providing the service API is located. |  |
| AefProfile | Clause 8.2.4.2.4 | Represents the AEF profile data. |  |
| CommunicationType | Clause 8.2.4.3.5 | Indicates a communication type of the resource or a custom operation. |  |
| CustomOperation | Clause 8.2.4.2.7 | Represents the description of a custom operation. |  |
| DataFormat | Clause 8.2.4.3.4 | Indicates a data format, e.g., JSON. |  |
| InterfaceDescription | Clause 8.2.4.2.3 | Represents the description of the API interface. |  |
| IpAddrRange | Clause 8.2.4.2.14 | Represents the list of IP address ranges information. |  |
| Operation | Clause 8.2.4.3.7 | Indicates an HTTP method (e.g. PUT). |  |
| Protocol | Clause 8.2.4.3.3 | Indicates a protocol and protocol version used by the API. |  |
| PublishedApiPath | Clause 8.2.4.2.9 | Represents the published API path within the same CAPIF provider domain. |  |
| Resource | Clause 8.2.4.2.6 | Represents the API resource data. |  |
| SecurityMethod | Clause 8.2.4.3.6 | Indicates the security method (e.g. PKI). |  |
| ServiceAPIDescription | Clause 8.2.4.2.2 | Represents the description of a service API as published by the APF. |  |
| ServiceAPIDescriptionPatch | Clause 8.2.4.2.11 | Represents the parameters to request the modification of an APF published API resource. | PatchUpdate |
| ServiceKpis | Clause 8.2.4.2.13 | Represents information about the service characteristics provided by a service API. | EdgeApp\_2 |
| ShareableInformation | Clause 8.2.4.2.8 | Indicates whether the service API and/or the service API category can be shared to the list of CAPIF provider domains. |  |
| Version | Clause 8.2.4.2.5 | Represents the API version information |  |

Table 8.2.4.1-2 specifies data types re-used by the CAPIF\_Publish\_Service\_API service:

Table 8.2.4.1-2: Re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| CivicAddress | 3GPP TS 29.572 [30] | Used to indicate a civic address. |  |
| DateTime | 3GPP TS 29.122 [14] | Used to indicate an expiration timer. |  |
| DurationSec | 3GPP TS 29.122 [14] | Indicates the duration in seconds. |  |
| Fqdn | 3GPP TS 29.571 [19] | Used to indicate a FQDN. |  |
| GeographicArea | 3GPP TS 29.572 [30] | Used to indicate a geographic area. |  |
| Ipv4Addr | 3GPP TS 29.122 [14] | Used to indicate an IPv4 address. |  |
| Ipv6Addr | 3GPP TS 29.122 [14] | Used to indicate an IPv6 address. |  |
| Ipv4AddressRange | 3GPP TS 29.571 [19] | Used to indicate the IPv4 address range. | RNAA |
| Ipv6AddressRange | 3GPP TS 29.571 [19] | Used to indicate the IPv6 address range. | RNAA |
| NetSliceId | 3GPP TS 29.435 [31] | Represents the identification information of a network slice. | NetworkSliceInfo |
| OAuthGrantType | Clause 8.5.4.3.4 | Used to represent the RNAA OAuth grant type. | RNAA |
| Port | 3GPP TS 29.122 [14] | Used to indicate a port. |  |
| SupportedFeatures | 3GPP TS 29.571 [19] | Used to negotiate the applicability of optional features defined in table 8.2.6-1. | ApiSupportedFeaturePublishing |
| Uinteger | 3GPP TS 29.571 [19] | Unsigned Integer, i.e. only value 0 and integers above 0 are permissible.Minimum = 0. |  |

\* \* \* Next change \* \* \* \*

##### 8.2.4.2.3 Type: InterfaceDescription

Table 8.2.4.2.3-1: Definition of type InterfaceDescription

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| ipv4Addr | Ipv4Addr | C | 0..1 | String identifying an IPv4 address (NOTE 1, NOTE 2) |  |
| ipv6Addr | Ipv6Addr | C | 0..1 | String identifying an IPv6 address (NOTE 1, NOTE 2) |  |
| fqdn | Fqdn | C | 0..1 | String containing a Fully Qualified Domain Name. (NOTE 1, NOTE 2) | ExtendedIntfDesc |
| port | Port | O | 0..1 | Port (NOTE 2) |  |
| apiPrefix | string | O | 0..1 | A string representing an optional deployment-specific string (API prefix) in the form of a sequence of path segments that starts with a "/" character. (NOTE 2) | ExtendedIntfDesc |
| securityMethods | array(SecurityMethod) | O | 1..N | Security methods supported by the interface. It takes precedence over the security methods provided in AefProfile, for this specific interface |  |
| grantTypes | array(OAuthGrantType) | C | 1..N | Contains the supported OAuth grant type(s). It takes precedence over the OAuth grant type(s) provided in AefProfile, for this specific interface.This attribute shall be present only for RNAA, as defined in clause 6.5.3 of TS 33.122 [16]. Otherwise, it is not applicable and shall not be present.This attribute may be present only when OAUTH is included in the "securityMethods" attribute. | RNAA |
| NOTE 1: Exactly one of the attributes "ipv4Addr", "ipv6Addr" and "fqdn" shall be included.NOTE 2: When the contents of this data type are used to construct the apiRoot of an API, they are used as described in clause 4.4.1 of 3GPP TS 29.501 [18]. NOTE 3: If the VendorExt feature is supported, vendor-specific extensions to the InterfaceDescription data structure, using the mechanism defined in clause 7.11, may be used to convey vendor-specific information. |

\* \* \* Next change \* \* \* \*

##### 8.2.4.2.4 Type: AefProfile

Table 8.2.4.2.4-1: Definition of type AefProfile

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| aefId | string | M | 1 | AEF identifier  |  |
| versions | array(Version) | M | 1..N | API version |  |
| protocol | Protocol | O | 0..1 | Protocol used by the API.(NOTE 3) |  |
| dataFormat | DataFormat | O | 0..1 | Data format used by the API(NOTE 3) |  |
| securityMethods | array(SecurityMethod) | O | 1..N | Security methods supported by the AEF for all interfaces. Certain interfaces may have different security methods supported in the attribute interfaceDescriptions. (NOTE 4) |  |
| grantTypes | array(OAuthGrantType) | C | 1..N | Contains the supported OAuth grant type(s). Certain interfaces may have different OAuth grant type(s) supported in the attribute interfaceDescriptions.This attribute shall be present only for RNAA, as defined in clause 6.5.3 of TS 33.122 [16]. Otherwise, it is not applicable and shall not be present.This attribute may be present only when OAUTH is included in the "securityMethods" attribute. | RNAA |
| domainName | string | O | 0..1 | Contains the domain name information used to construct the “apiRoot” variable of the API URI.(NOTE 1) |  |
| interfaceDescriptions | array(InterfaceDescription) | O | 1..N | Interface details(NOTE 1) |  |
| aefLocation | AefLocation | O | 0..1 | The location information (e.g. civic address, GPS coordinates, data center ID) where the AEF providing the service API is located. |  |
| serviceKpis | ServiceKpis | O | 0..1 | Contains information about the service characteristics provided by the service API. | EdgeApp\_2 |
| ueIpRange | IpAddrRange | O | 0..1 | The list of public IP ranges of UEs. | RNAA |
| NOTE 1: Only one of the attributes "domainName" or "interfaceDescriptions" shall be included.NOTE 2: Notification or callback type of resource is not included.NOTE 3: If the VendorExt feature is supported, vendor-specific extensions to the AefProfile data structure, using the mechanism defined in clause 7.11, may be used to convey vendor-specific information.NOTE 4: For AEFs defined by 3GPP interacting with API invokers via CAPIF-2e, at least one of the "securityMethods" attribute within this data type or the "securityMethods" attribute within the "interfaceDescriptions" attribute shall be present. For AEFs defined by 3GPP interacting with API invokers via CAPIF-2, the "securityMethods" attribute is optional. For AEFs not defined by 3GPP, the "securityMethods" attribute is optional. |

\* \* \* Next change \* \* \* \*

### 8.2.6 Feature negotiation

The optional features in table 8.1.6-1 are defined for the the CAPIF\_Publish\_Service\_API. General feature negotiation procedures are defined in clause 7.8.

Table 8.2.6-1: Supported Features

|  |  |  |
| --- | --- | --- |
| **Feature number** | **Feature Name** | **Description** |
| 1 | ApiSupportedFeaturePublishing | Indicates the support of publishing with supported feature for a service API. |
| 2 | PatchUpdate | Indicates the support of the PATCH method for updating an APF published API resource. |
| 3 | ExtendedIntfDesc | Indicates the support of extended interface descriptions. |
| 4 | MultipleCustomOperations | Indicates the support of modelling multiple custom operations associated with a resource. |
| 5 | ProtocDataFormats\_Ext1 | Indicates the support of additional protocols and data formats with standardized values.(NOTE) |
| 6 | ApiStatusMonitoring | Indicates the support of the API status monitoring in CAPIF layer as a part of enhancement of SEAL framework.This feature enables the following functionality:- support API status information management. |
| 7 | EdgeApp\_2 | This feature indicates the support of the enhancements to the Edge Applications. Within this feature, the following enhancements are covered:- support of Service KPI. |
| 8 | RNAA | Indicates the support of the RNAA functionality.This feature enables the following functionality:- provisioning of the API provider name and the related filtering criteria.- provisioning of the list of public IP ranges of UEs for service API publish and update enhancements.- provisioning of the supported OAuth grant type(s) during the API publishing. |
| 9 | VendorExt | Indicates the support for CAPIF vendor specific extensions.(NOTE) |
| 10 | SliceBasedAPIExposure | Indicates the support of the network slice-based API exposure functionality.Within this feature, the following enhancements are covered:- Support the provisioning and management of the applicable network slice(s) for a published API. |
| NOTE: In this release of the specification, this feature is only applicable for AEFs defined outside 3GPP (e.g. by other SDOs). It does not apply to AEFs defined by 3GPP (e.g. SCEF, NEF). |

\* \* \* Next change \* \* \* \*

# A.3 CAPIF\_Publish\_Service\_API

openapi: 3.0.0

info:

 title: CAPIF\_Publish\_Service\_API

 description: |

 API for publishing service APIs.

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 version: "1.4.0-alpha.1"

externalDocs:

 description: 3GPP TS 29.222 V19.0.0 Common API Framework for 3GPP Northbound APIs

 url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.222/

servers:

 - url: '{apiRoot}/published-apis/v1'

 variables:

 apiRoot:

 default: https://example.com

 description: apiRoot as defined in clause 7.5 of 3GPP TS 29.222.

paths:

# APF published API

 /{apfId}/service-apis:

 post:

 description: Publish a new API.

 parameters:

 - name: apfId

 in: path

 required: true

 schema:

 type: string

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: >

 Service API published successfully The URI of the created resource

 shall be returned in the "Location" HTTP header.

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: >

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

 {apiRoot}/published-apis/v1/{apfId}/service-apis/{serviceApiId}

 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'

 get:

 description: Retrieve all published APIs.

 parameters:

 - name: apfId

 in: path

 required: true

 schema:

 type: string

 responses:

 '200':

 description: Definition of all service API(s) published by the API publishing function.

 content:

 application/json:

 schema:

 type: array

 items:

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

 minItems: 0

 '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'

# Individual APF published API

 /{apfId}/service-apis/{serviceApiId}:

 get:

 description: Retrieve a published service API.

 parameters:

 - name: serviceApiId

 in: path

 required: true

 schema:

 type: string

 - name: apfId

 in: path

 required: true

 schema:

 type: string

 responses:

 '200':

 description: >

 Definition of individual service API published by the API publishing function.

 content:

 application/json:

 schema:

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

 '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'

 put:

 description: Update a published service API.

 parameters:

 - name: serviceApiId

 in: path

 required: true

 schema:

 type: string

 - name: apfId

 in: path

 required: true

 schema:

 type: string

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '200':

 description: Definition of service API updated successfully.

 content:

 application/json:

 schema:

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

 '204':

 description: No Content

 '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'

 patch:

 description: Modify an existing published service API.

 operationId: ModifyIndAPFPubAPI

 tags:

 - Individual APF published API

 parameters:

 - name: serviceApiId

 in: path

 required: true

 schema:

 type: string

 - name: apfId

 in: path

 required: true

 schema:

 type: string

 requestBody:

 required: true

 content:

 application/merge-patch+json:

 schema:

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

 responses:

 '200':

 description: >

 The definition of the service API is modified successfully and a

 representation of the updated service API is returned in the request body.

 content:

 application/json:

 schema:

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

 '204':

 description: No Content. The definition of the service API is modified 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: Unpublish a published service API.

 parameters:

 - name: serviceApiId

 in: path

 required: true

 schema:

 type: string

 - name: apfId

 in: path

 required: true

 schema:

 type: string

 responses:

 '204':

 description: The individual published service API matching the serviceAPiId 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'

# Components

components:

 schemas:

# Data Type for representations

 ServiceAPIDescription:

 type: object

 description: Represents the description of a service API as published by the APF.

 properties:

 apiName:

 type: string

 description: >

 API name, it is set as {apiName} part of the URI structure as defined in

 clause 5.2.4 of 3GPP TS 29.122.

 apiId:

 type: string

 description: >

 API identifier assigned by the CAPIF core function to the published service API.

 Shall not be present in the HTTP POST request from the API publishing function

 to the CAPIF core function. Shall be present in the HTTP POST response from the

 CAPIF core function to the API publishing function and in the HTTP GET response

 from the CAPIF core function to the API invoker (discovery API).

 apiStatus:

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

 aefProfiles:

 type: array

 items:

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

 minItems: 1

 description: >

 AEF profile information, which includes the exposed API details (e.g. protocol).

 description:

 type: string

 description: Text description of the API

 supportedFeatures:

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

 shareableInfo:

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

 serviceAPICategory:

 type: string

 description: The service API category to which the service API belongs to.

 apiSuppFeats:

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

 pubApiPath:

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

 ccfId:

 type: string

 description: CAPIF core function identifier.

 apiProvName:

 type: string

 description: Represents the API provider name.

 netSliceInfo:

 type: array

 items:

 $ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

 minItems: 1

 description: Represents the applicable network slice identifiers.

 required:

 - apiName

 InterfaceDescription:

 type: object

 description: Represents the description of an API's interface.

 properties:

 ipv4Addr:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Ipv4Addr'

 ipv6Addr:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Ipv6Addr'

 fqdn:

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

 port:

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

 apiPrefix:

 type: string

 description: >

 A string representing a sequence of path segments that starts with the slash character.

 securityMethods:

 type: array

 items:

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

 minItems: 1

 description: >

 Security methods supported by the interface, it take precedence over

 the security methods provided in AefProfile, for this specific interface.

 grantTypes:

 type: array

 items:

 $ref: 'TS29222\_CAPIF\_Security\_API.yaml#/components/schemas/OAuthGrantType'

 minItems: 1

 description: >

 Contains the supported OAuth grant type(s). It takes precedence over

 the OAuth grant type(s) provided in AefProfile, for this specific interface.

 oneOf:

 - required: [ipv4Addr]

 - required: [ipv6Addr]

 - required: [fqdn]

 AefProfile:

 type: object

 description: Represents the AEF profile data.

 properties:

 aefId:

 type: string

 description: Identifier of the API exposing function

 versions:

 type: array

 items:

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

 minItems: 1

 description: API version

 protocol:

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

 dataFormat:

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

 securityMethods:

 type: array

 items:

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

 minItems: 1

 description: Security methods supported by the AEF

 grantTypes:

 type: array

 items:

 $ref: 'TS29222\_CAPIF\_Security\_API.yaml#/components/schemas/OAuthGrantType'

 minItems: 1

 description: >

 Contains the supported OAuth grant type(s). Certain interfaces may have

 different OAuth grant type(s) supported in the attribute interfaceDescriptions.

 domainName:

 type: string

 description: Domain to which API belongs to

 interfaceDescriptions:

 type: array

 items:

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

 minItems: 1

 description: Interface details

 aefLocation:

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

 serviceKpis:

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

 ueIpRange:

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

 required:

 - aefId

 - versions

 oneOf:

 - required: [domainName]

 - required: [interfaceDescriptions]

 Resource:

 type: object

 description: Represents the API resource data.

 properties:

 resourceName:

 type: string

 description: Resource name

 commType:

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

 uri:

 type: string

 description: >

 Relative URI of the API resource, it is set as {apiSpecificSuffixes} part

 of the URI structure as defined in clause 5.2.4 of 3GPP TS 29.122.

 custOpName:

 type: string

 description: >

 it is set as {custOpName} part of the URI structure for a custom operation

 associated with a resource as defined in clause 5.2.4 of 3GPP TS 29.122.

 custOperations:

 type: array

 items:

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

 minItems: 1

 description: >

 Custom operations associated with this resource.

 operations:

 type: array

 items:

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

 minItems: 1

 description: >

 Supported HTTP methods for the API resource. Only applicable when the

 protocol in AefProfile indicates HTTP.

 description:

 type: string

 description: Text description of the API resource

 required:

 - resourceName

 - commType

 - uri

 CustomOperation:

 type: object

 description: Represents the description of a custom operation.

 properties:

 commType:

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

 custOpName:

 type: string

 description: >

 it is set as {custOpName} part of the URI structure for a custom operation

 without resource association as defined in clause 5.2.4 of 3GPP TS 29.122.

 operations:

 type: array

 items:

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

 minItems: 1

 description: >

 Supported HTTP methods for the API resource. Only applicable when the

 protocol in AefProfile indicates HTTP.

 description:

 type: string

 description: Text description of the custom operation

 required:

 - commType

 - custOpName

 Version:

 type: object

 description: Represents the API version information.

 properties:

 apiVersion:

 type: string

 description: API major version in URI (e.g. v1)

 expiry:

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

 resources:

 type: array

 items:

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

 minItems: 1

 description: Resources supported by the API.

 custOperations:

 type: array

 items:

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

 minItems: 1

 description: Custom operations without resource association.

 required:

 - apiVersion

 ShareableInformation:

 type: object

 description: >

 Indicates whether the service API and/or the service API category can be shared

 to the list of CAPIF provider domains.

 properties:

 isShareable:

 type: boolean

 description: >

 Set to "true" indicates that the service API and/or the service API

 category can be shared to the list of CAPIF provider domain information.

 Otherwise set to "false".

 capifProvDoms:

 type: array

 items:

 type: string

 minItems: 1

 description: >

 List of CAPIF provider domains to which the service API information to be shared.

 required:

 - isShareable

 PublishedApiPath:

 type: object

 description: Represents the published API path within the same CAPIF provider domain.

 properties:

 ccfIds:

 type: array

 items:

 type: string

 minItems: 1

 description: A list of CCF identifiers where the service API is already published.

 AefLocation:

 description: >

 Represents the location information (e.g. civic address, GPS coordinates, data center ID)

 where the AEF providing the service API is located.

 type: object

 properties:

 civicAddr:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/CivicAddress'

 geoArea:

 $ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicArea'

 dcId:

 type: string

 description: >

 Identifies the data center where the AEF providing the service API is located.

 ServiceAPIDescriptionPatch:

 type: object

 description: >

 Represents the parameters to request the modification of an APF published API resource.

 properties:

 apiStatus:

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

 aefProfiles:

 type: array

 items:

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

 description: AEF profile information, which includes the exposed API details.

 minItems: 1

 description:

 type: string

 description: Text description of the API

 shareableInfo:

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

 serviceAPICategory:

 type: string

 description: The service API category to which the service API belongs to.

 apiSuppFeats:

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

 pubApiPath:

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

 ccfId:

 type: string

 description: CAPIF core function identifier.

 ApiStatus:

 type: object

 description: >

 Represents the API status.

 properties:

 aefIds:

 type: array

 items:

 type: string

 description: >

 Indicates the list of AEF ID(s) where the API is active.

 If this attribute is omitted, the API is inactive at all AEF(s)

 defined in the "aefProfiles" attribute within

 the ServiceAPIDescription data structure.

 required:

 - aefIds

 ServiceKpis:

 type: object

 description: >

 Represents information about the service characteristics provided by a service API.

 properties:

 maxReqRate:

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

 maxRestime:

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

 availability:

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

 avalComp:

 type: string

 pattern: '^\d+(\.\d+)? (kFLOPS|MFLOPS|GFLOPS|TFLOPS|PFLOPS|EFLOPS|ZFLOPS)$'

 description: >

 The maximum compute resource available in FLOPS for the API Invoker.

 avalGraComp:

 type: string

 pattern: '^\d+(\.\d+)? (kFLOPS|MFLOPS|GFLOPS|TFLOPS|PFLOPS|EFLOPS|ZFLOPS)$'

 description: >

 The maximum graphical compute resource in FLOPS available for the API Invoker.

 avalMem:

 type: string

 pattern: '^\d+(\.\d+)? (KB|MB|GB|TB|PB|EB|ZB|YB)$'

 description: >

 The maximum memory resource available for the API Invoker.

 avalStor:

 type: string

 pattern: '^\d+(\.\d+)? (KB|MB|GB|TB|PB|EB|ZB|YB)$'

 description: >

 The maximum storage resource available for the API Invoker.

 conBand:

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

 IpAddrRange:

 description: Represents the list of public IP ranges

 type: object

 properties:

 ueIpv4AddrRanges:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4AddressRange'

 description: Represents the IPv4 Address ranges of the UE(s).

 minItems: 1

 ueIpv6AddrRanges:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6AddressRange'

 description: Represents the Ipv6 Address ranges of the UE(s).

 minItems: 1

 anyOf:

 - required: [ueIpv4AddrRanges]

 - required: [ueIpv6AddrRanges]

 Protocol:

 anyOf:

 - type: string

 enum:

 - HTTP\_1\_1

 - HTTP\_2

 - MQTT

 - WEBSOCKET

 - 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: |

 Indicates a protocol and protocol version used by the API.

 Possible values are:

 - HTTP\_1\_1: Indicates that the protocol is HTTP version 1.1.

 - HTTP\_2: Indicates that the protocol is HTTP version 2.

 - MQTT: Indicates that the protocol is Message Queuing Telemetry Transport.

 - WEBSOCKET: Indicates that the protocol is Websocket.

 CommunicationType:

 anyOf:

 - type: string

 enum:

 - REQUEST\_RESPONSE

 - SUBSCRIBE\_NOTIFY

 - 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: |

 Indicates a communication type of the resource or the custom operation.

 Possible values are:

 - REQUEST\_RESPONSE: The communication is of the type request-response.

 - SUBSCRIBE\_NOTIFY: The communication is of the type subscribe-notify.

 DataFormat:

 anyOf:

 - type: string

 enum:

 - JSON

 - XML

 - PROTOBUF3

 - 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: |

 Indicates a data format.

 Possible values are:

 - JSON: Indicates that the data format is JSON.

 - XML: Indicates that the data format is Extensible Markup Language.

 - PROTOBUF3: Indicates that the data format is Protocol buffers version 3.

 SecurityMethod:

 anyOf:

 - type: string

 enum:

 - PSK

 - PKI

 - OAUTH

 - 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: |

 Indicates the security method.

 Possible values are:

 - PSK: Security method 1 (Using TLS-PSK) as described in 3GPP TS 33.122.

 - PKI: Security method 2 (Using PKI) as described in 3GPP TS 33.122.

 - OAUTH: Security method 3 (TLS with OAuth token) as described in 3GPP TS 33.122.

 Operation:

 anyOf:

 - type: string

 enum:

 - GET

 - POST

 - PUT

 - PATCH

 - DELETE

 - 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: |

 Indicates an HTTP method.

 Possible values are:

 - GET: HTTP GET method.

 - POST: HTTP POST method.

 - PUT: HTTP PUT method.

 - PATCH: HTTP PATCH method.

 - DELETE: HTTP DELETE method.

\* \* \* End of changes \* \* \* \*