**3GPP TSG CT WG3 Meeting #135 *C3-243xxx***

**Hyderabad, IN, 27 - 31 May, 2024 was C3-243246**

|  |
| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** | **0351** | **rev** | **1** | **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)*.* |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| --- |
|  |
| ***Title:***  | Various essential corrections |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | NBI18 |  | ***Date:*** | 2024-05-30 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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:*** | There are various issues, incorrect provisions and misalignments with the drafting rules / NBI TS skeleton in the definition of some of the CAPIF APIs.For example:* The NOTE in Table 8.1.4.2.2-1 is incorrect. Returning the list of supported features for the GET request/response cannot be done via each individual resource as it cannot be different for each returned resource. It should be done by returning a single list of supported features that will apply to all the returned resource(s).
* The NOTEs in Tables 8.2.4.2.2/11-1 can be misleading and require some clarifications.
* Incorrect reference number for TS 29.122 in some occurrences of the TS.
* The "Lint" tool executing rule "NO\_$REF\_SIBLINGS" is not respected in the definition of the "maxReqRate" and "conBand" attributes of the ServiceKpis data type defined in the CAPIF\_Publish\_Service\_API.
* etc.
 |
|  |  |
| ***Summary of change:*** | This CR proposes to:* Address these issues.
* Apply additional editorial corrections.
 |
|  |  |
| ***Consequences if not approved:*** | * The existing issues, incorrect provisions and misalignments with the drafting rules / NBI TS skeleton remain in the specification and its quality is not improved.
 |
|  |  |
| ***Clauses affected:*** | 8.1.1, 8.1.2, 8.1.2.1, 8.1.2.2.1, 8.1.2.2.2, 8.1.2.2.3.1, 8.1.2.2.4, 8.1.4.1, 8.1.4.2.2, 8.1.4.2.4, 8.1.4.4 (new clause), 8.1.6, 8.2.1, 8.2.2, 8.2.2.1, 8.2.2.2.1, 8.2.2.2.2, 8.2.2.2.3.1, 8.2.2.2.3.2, 8.2.2.2.4, 8.2.2.3.1, 8.2.2.3.2, 8.2.2.3.3.1, 8.2.2.3.3.2, 8.2.2.3.3.3, 8.2.2.3.3.4, 8.2.2.3.4, 8.2.4.1, 8.2.4.2.1, 8.2.4.2.2, 8.2.4.2.11, 8.2.6, 8.3.2.3.3.2, 8.3.2.3.3.3, 8.3.3.2.2, 8.4.2.1, 8.4.3.2.2, 8.4.3.3.2, 8.5.2.1, 8.5.2.3.3.1, 8.5.3.2.2, 8.5.4.2.6, 8.5.5.1, A.2, 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 CR introduces backwards compatible corrections to the OpenAPI descriptions of the CAPIF\_Discover\_Service\_API and CAPIF\_Publish\_Service\_API defined in this specification. |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* \* Start of changes \* \* \* \*

### 8.1.1 API URI

The CAPIF\_Discover\_Service\_API service shall use the CAPIF\_Discover\_Service\_API.

The request URIs used in HTTP requests from the API invoker towards the CCF shall have the Resource URI structure defined in clause 7.5 with the following clarifications:

- The <apiName>shall be "service-apis".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 8.1.2.

All the resource URIs and the custom operation URIs specified in the clauses below are defined relative to the above API URI.

\* \* \* \* Next changes \* \* \* \*

### 8.1.2 Resources

\* \* \* \* Next changes \* \* \* \*

#### 8.1.2.1 Overview

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

Figure 8.1.2.1-1 depicts the resource URIs structure for the CAPIF\_Discover\_Service\_API.



Figure 8.1.2.1-1: Resource URI structure of the CAPIF\_Discover\_Service\_API

Table 8.1.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.1.2.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| All published service APIs | /allServiceAPIs(NOTE) | GET | Discover service APIs according to certain filter criteria. |
| NOTE: The path segment "allServiceAPIs" does not follow the related naming convention defined in clause 7.5.1. The path segment is however kept as currently defined in this specification for backward compatibility considerations. |

\* \* \* \* Next changes \* \* \* \*

##### 8.1.2.2.1 Description

This resource represents the collection of published service APIs at the CCF.

This resource is modelled using the Store resource archetype (see Annex C.3 of 3GPP TS 29.501 [18]).

\* \* \* \* Next changes \* \* \* \*

##### 8.1.2.2.2 Resource Definition

Resource URI: **{apiRoot}/service-apis/<apiVersion>/allServiceAPIs**

This resource shall support the resource URI variables defined in table 8.1.2.2.2-1.

Table 8.1.2.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 7.5. |

\* \* \* \* Next changes \* \* \* \*

###### 8.1.2.2.3.1 GET

The HTTP GET method enables to retrieve a list of APIs currently registered at the CCF and satisfying a number of filter criteria.

Table 8.1.2.2.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| api-invoker-id | string | M | 1 | It represents the identifier (assigned by the CCF) ofthe API invoker that is sending the request. It may also represent the identifier of the CCF that is sending the request if the request is sent over the CAPIF-6/6e reference point. (NOTE 1) |  |
| api-name | string | O | 0..1 | Contains the API name as {apiName} part of the URI structure as defined in clause 5.2.4 of 3GPP TS 29.122 [14]. |  |
| api-version | string | O | 0..1 | Contains the API major version conveyed in the URI (e.g. v1). |  |
| comm-type | CommunicationType | O | 0..1 | Communication type used by the API (e.g. REQUEST\_RESPONSE). |  |
| protocol | Protocol | O | 0..1 | Protocol used by the API. |  |
| aef-id | string | O | 0..1 | AEF identifier. |  |
| data-format | DataFormat | O | 0..1 | Data format used by the API (e.g. serialization protocol JSON). |  |
| api-cat | string | O | 0..1 | The service API category to which the service API belongs. |  |
| preferred-aef-loc | AefLocation | O | 0..1 | The preferred AEF location. If this parameter is present, the CCF shall try to discover a matched AEF location the service API supports. This parameter is ignored by the CCF if there is no matching record found. |  |
| req-api-prov-name | string | O | 0..1 | Represents the required API provider name. | RNAA |
| supported-features | SupportedFeatures | O | 0..1 | To filter irrelevant responses related to unsupported features. |  |
| api-supported-features | SupportedFeatures | C | 0..1 | Features supported by the discovered service API indicated by api-name parameter. This may only be present if the api-name query parameter is present. | ApiSupportedFeatureQuery |
| ue-ip-addr | IpAddrInfo | O | 0..1 | Represents the UE IP address information. | RNAA |
| service-kpis | ServiceKpis | O | 0..1 | Contains information about service characteristics provided by the targeted service API(s). | EdgeApp\_2 |
| NOTE 1: This parameter is not part of the API filter criteria so that it is not used in matching APIs published in the CCF.NOTE 2: In addition to the above standardized query parameters, the service consumer may also provide vendor-specific query parameter(s) as specified in clause 5.2.13.3 of 3GPP TS 29.122 [14]. The CCF shall use any received vendor-specific query parameters in the filtering process of the results to be returned in the response in a similar way and in addition to the standardized query parameters defined in this table. This capability may be signalled using the "VendSpecQueryParams" feature. |

This method shall support the request data structures specified in table 8.1.2.2.3.1-2 and the response data structures and response codes specified in table 8.1.2.2.3.1-3.

Table 8.1.2.2.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 8.1.2.2.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| DiscoveredAPIs | M | 1 | 200 OK | The response body contains the result of the search over the list of registered APIs. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| ProblemDetails | O | 0..1 | 414 URI Too Long | Indicates that the server refuses to process the request because the request-target is too long. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] shall also apply. |

Table 8.1.2.2.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative CCF. |

Table 8.1.2.2.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative CCF. |

\* \* \* \* Next changes \* \* \* \*

##### 8.1.2.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

\* \* \* \* Next changes \* \* \* \*

#### 8.1.4.1 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 8.1.4.1-1 specifies the data types defined specifically for the CAPIF\_Discover\_Service\_API.

Table 8.1.4.1-1: CAPIF\_Discover\_Service\_API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| DiscoveredAPIs | Clause 8.1.4.2.2 | Represents a list of APIs currently registered at the CCF and satisfying a number of filter criteria provided by the service consumer. |  |
| IpAddrInfo | Clause 8.1.4.2.4 | Represents the UE IP address information. | RNAA |

Table 8.1.4.1-2 specifies data types re-used by the CAPIF\_Discover\_Service\_API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the CAPIF\_Discover\_Service\_API.

Table 8.1.4.1-2: Re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AefLocation | Clause 8.2.4.2.10 | Used to indicate the AEF location. |  |
| CommunicationType | Clause 8.2.4.3.5 | Used to indicate the communication type used by the API. |  |
| Ipv4Addr | 3GPP TS 29.122 [14] | Used to indicate an IPv4 address. | RNAA |
| Ipv6Addr | 3GPP TS 29.122 [14] | Used to indicate an IPv6 address. | RNAA |
| ProblemDetails | 3GPP TS 29.122 [14] | Used to represent additional information and details on an error response. |  |
| ServiceKpis | Clause 8.2.4.2.13 | Represents information about the service characteristics provided by a service API. | EdgeApp\_2 |
| SupportedFeatures | 3GPP TS 29.571 [19] | Used to negotiate the applicability of optional features defined in table 8.1.6-1. |  |

\* \* \* \* Next changes \* \* \* \*

##### 8.1.4.2.2 Type: DiscoveredAPIs

Table 8.1.4.2.2-1: Definition of type DiscoveredAPIs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| serviceAPIDescriptions | array(ServiceAPIDescription) | O | 1..N | Description of the service API as published by the service. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 8.1.6.This attribute shall be present only when feature negotiation needs to take place. |  |
|  |

\* \* \* \* Next changes \* \* \* \*

##### 8.1.4.2.4 Type: IpAddrInfo

Table 8.1.4.2.4-1: Definition of type IpAddrInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| ipv4Addr | Ipv4Addr | C | 0..1 | Contains the IPv4 address of the UE.(NOTE) |  |
| ipv6Addr | Ipv6Addr | C | 0..1 | Contains the IPv6 address of the UE.(NOTE) |  |
| NOTE: These attributes are mutually exclusive. Either one of them shall be present. |

\* \* \* \* Next changes \* \* \* \*

#### 8.1.4.3 Simple data types and enumerations

##### 8.1.4.3.1 Introduction

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

##### 8.1.4.3.2 Simple data types

The simple data types defined in table 8.1.4.3.2-1 shall be supported.

Table 8.1.4.3.2-1: Simple data types

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

\* \* \* \* Next changes \* \* \* \*

#### 8.1.4.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

\* \* \* \* Next changes \* \* \* \*

### 8.1.6 Feature negotiation

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

Table 8.1.6-1: Supported Features

|  |  |  |
| --- | --- | --- |
| **Feature number** | **Feature Name** | **Description** |
| 1 | ApiSupportedFeatureQuery | Indicates the support of the query filter indicating the supported feature(s) of a service API. |
| 2 | VendSpecQueryParams | Indicates the support of vendor specific API discovery query filter parameters. |
| 3 | RNAA | Indicates the support of the RNAA functionality.This feature enables the following functionalities:- provisioning the API provider name and the related filtering criteria enhancement.- provisioning the UE IP address information and the related filtering criteria enhancement. |

\* \* \* \* Next changes \* \* \* \*

### 8.2.1 API URI

The CAPIF\_Publish\_Service\_API service shall use the CAPIF\_Publish\_Service\_API.

The request URIs used in HTTP requests from the API publishing function towards the CCF shall have the Resource URI structure as defined in clause 7.5 with the following clarifications:

- The <apiName>shall be "published-apis".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 8.2.2.

All the resource URIs and the custom operation URIs specified in the clauses below are defined relative to the above API URI.

\* \* \* \* Next changes \* \* \* \*

### 8.2.2 Resources

\* \* \* \* Next changes \* \* \* \*

#### 8.2.2.1 Overview

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

Figure 8.2.2.1-1 depicts the resource URIs structure for the CAPIF\_Publish\_Service\_API.



Figure 8.2.2.1-1: Resource URI structure of the CAPIF\_Publish\_Service\_API

Table 8.2.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.2.2.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| APF published APIs  | /{apfId}/service-apis | POST | Publish a new API |
| GET | Retrieve all the published service APIs. |
| Individual APF published API | /{apfId}/service-apis/{serviceApiId} | GET | Retrieve an existing published service API. |
| PUT | Update an existing published service API. |
| PATCH | Modify an existing published service API. |
| DELETE | Delete an existing published service API. |

\* \* \* \* Next changes \* \* \* \*

##### 8.2.2.2.1 Description

This resource represents all the published service APIs at the CCF for a given APF.

The resource is modelled using the Collection resource archetype (see Annex C.2 of 3GPP TS 29.501 [18]).

\* \* \* \* Next changes \* \* \* \*

##### 8.2.2.2.2 Resource Definition

Resource URI: **{apiRoot}/published-apis/<apiVersion>/{apfId}/service-apis**

This resource shall support the resource URI variables defined in table 8.2.2.2.2-1.

Table 8.2.2.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 7.5. |
| apfId | string | Identifies the API publishing function that is publishing the service API.For the CAPIF interconnection case, this string identifies the CCF that is publishing the service API. |

\* \* \* \* Next changes \* \* \* \*

###### 8.2.2.2.3.1 POST

The HTTP POST method enables a service consumer to request to publish a new API at the CCF.

This method shall support the URI query parameters specified in table 8.2.2.2.3.1-1.

Table 8.2.2.2.3.1-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 8.2.2.2.3.1-2 and the response data structures and response codes specified in table 8.2.2.2.3.1-3.

Table 8.2.2.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| ServiceAPIDescription | M | 1 | Contains the parameters defining the service API to be published. |

Table 8.2.2.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| ServiceAPIDescription | M | 1 | 201 Created | Successful case. The service API is successfully published.The URI of the created "Individual APF published API" resource shall be returned in an HTTP "Location" header. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] shall also apply. |

Table 8.2.2.2.3.1-4: 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}/published-apis/<apiVersion>/{apfId}/service-apis/{serviceApiId} |

\* \* \* \* Next changes \* \* \* \*

###### 8.2.2.2.3.2 GET

The HTTP GET method enables a service consumer to retrieve all the published service APIs at the CCF.

This method shall support the URI query parameters specified in table 8.2.2.2.3.2-1.

Table 8.2.2.2.3.2-1: URI query parameters supported by the GET method on this resource

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

This method shall support the request data structures specified in table 8.2.2.2.3.2-2 and the response data structures and response codes specified in table 8.2.2.2.3.2-3.

Table 8.2.2.2.3.2-2: Data structures supported by the GET Request Body on this resource

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

Table 8.2.2.2.3.2-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| array(ServiceAPIDescription) | O | 0..N | 200 OK | Successful case. The representation(s) of the "Individual APF published API" resource(s) of the requested service API(s) shall be returned in the response body.If there are no active "Individual APF published API" resources at the CCF, an empty array is returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] shall also apply. |

Table 8.2.2.2.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative CCF. |

Table 8.2.2.2.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative CCF. |

\* \* \* \* Next changes \* \* \* \*

##### 8.2.2.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

\* \* \* \* Next changes \* \* \* \*

##### 8.2.2.3.1 Description

The Individual APF published API resource represents an individual published service API.

The resource is modelled using the Document resource archetype (see Annex C.1 of 3GPP TS 29.501 [18]).

\* \* \* \* Next changes \* \* \* \*

##### 8.2.2.3.2 Resource Definition

Resource URI: **{apiRoot}/published-apis/<apiVersion>/{apfId}/service-apis/{serviceApiId}**

This resource shall support the resource URI variables defined in table 8.2.2.3.2-1.

Table 8.2.2.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 7.5 |
| apfId | string | Identifies the API publishing function that is publishing the service API.For the CAPIF interconnection case, this string identifies the CCF that is publishing the service API. |
| serviceApiId | string | Identifies an "Individual APF published API" resource. |

\* \* \* \* Next changes \* \* \* \*

###### 8.2.2.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual APF published API" resource at the CCF.

This method shall support the URI query parameters specified in table 8.2.2.3.3.1-1.

Table 8.2.2.3.3.1-1: URI query parameters supported by the GET method on this resource

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

This method shall support the request data structures specified in table 8.2.2.3.3.1-2 and the response data structures and response codes specified in table 8.2.2.3.3.1-3.

Table 8.2.2.3.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 8.2.2.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| ServiceAPIDescription | M | 1 | 200 OK | Successful case. The service API is successfully published and a representation of the created "Individual APF published API" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] shall also apply. |

Table 8.2.2.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative CCF. |

Table 8.2.2.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative CCF. |

\* \* \* \* Next changes \* \* \* \*

###### 8.2.2.3.3.2 PUT

The HTTP PUT method allows a service consumer to update an existing "Individual APF published API" resource at the CCF.

This method shall support the URI query parameters specified in table 8.2.2.3.3.2-1.

Table 8.2.2.3.3.2-1: URI query parameters supported by the PUT method on this resource

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

This method shall support the request data structures specified in table 8.2.2.3.3.2-2 and the response data structures and response codes specified in table 8.2.2.3.3.2-3.

Table 8.2.2.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| ServiceAPIDescription | M | 1 | Contains the updated representation of the "Individual APF published API" resource. |

Table 8.2.2.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| ServiceAPIDescription | M | 1 | 200 OK | Successful case. The "Individual APF published API" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual APF published API" resource is successfully updated and no content is returned in the response body.  |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] shall also apply. |

Table 8.2.2.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative CCF. |

Table 8.2.2.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative CCF. |

\* \* \* \* Next changes \* \* \* \*

###### 8.2.2.3.3.3 DELETE

The HTTP DELETE method allows a service consumer to delete an existing "Individual APF published API" resource at the CCF.

This method shall support the URI query parameters specified in table 8.2.2.3.3.3-1.

Table 8.2.2.3.3.3-1: URI query parameters supported by the GET method on this resource

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

This method shall support the request data structures specified in table 8.2.2.3.3.3-2 and the response data structures and response codes specified in table 8.2.2.3.3.3-3.

Table 8.2.2.3.3.3-2: Data structures supported by the DELETE Request Body on this resource

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

Table 8.2.2.3.3.3-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual APF published API" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] shall also apply. |

Table 8.2.2.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative CCF. |

Table 8.2.2.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative CCF. |

\* \* \* \* Next changes \* \* \* \*

###### 8.2.2.3.3.4 PATCH

The HTTP PATCH method allows a service consumer to modify an existing "Individual APF published API" resource at the CCF.

This method shall support the URI query parameters specified in table 8.2.2.3.3.4-1.

Table 8.2.2.3.3.4-1: URI query parameters supported by the PATCH method on this resource

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

This method shall support the request data structures specified in table 8.2.2.3.3.4-2 and the response data structures and response codes specified in table 8.2.2.3.3.4-3.

Table 8.2.2.3.3.4-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| ServiceAPIDescriptionPatch | M | 1 | Contains the modifications to be applied to the "Individual APF published API" resource. |

Table 8.2.2.3.3.4-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| ServiceAPIDescription | M | 1 | 200 OK | Successful case. The "Individual APF published API" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual APF published API" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] shall also apply. |

Table 8.2.2.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative CCF. |

Table 8.2.2.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative CCF. |

\* \* \* \* Next changes \* \* \* \*

##### 8.2.2.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

\* \* \* \* Next changes \* \* \* \*

#### 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 |
| 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 changes \* \* \* \*

##### 8.2.4.2.1 Introduction

This clause defines the structured data types to be used in resource representations of the CAPIF\_Publish\_Service\_API.

\* \* \* \* Next changes \* \* \* \*

##### 8.2.4.2.2 Type: ServiceAPIDescription

Table 8.2.4.2.2-1: Definition of type ServiceAPIDescription

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| apiName | string | M | 1 | API name, it is set as {apiName} part of the URI structure as defined in clause 5.2.4 of 3GPP TS 29.122 [14]. |  |
| apiId | string | O | 0..1 | API identifier assigned by the CCF to the published service API. Shall not be present in the HTTP POST request from the API publishing function to the CCF. Shall be present in the HTTP POST response from the CCF to the API publishing function and in the HTTP GET response from the CCF to the API invoker (discovery API). |  |
| apiStatus | ApiStatus | O | 0..1 | Indicates the API status.If this attribute is omitted, the Service API is active at all AEF(s) present in the "aefProfiles" attribute. | ApiStatusMonitoring |
| aefProfiles | array(AefProfile) | C | 1..N | AEF profile information, which includes the exposed API details (e.g. protocol). For CAPIF-4/4e interface, API publishing function shall provide this attribute to the CCF in service API publishing. For CAPIF-1/1e interface, the CCF shall provide this attribute to the API Invoker during service API discovery. (NOTE 2) |  |
| description | string | O | 0..1 | Text description of the API. |  |
| supportedFeatures | SupportedFeatures | O | 0..1 | The supported optional features of the CAPIF API.(NOTE 1) |  |
| shareableInfo | ShareableInformation | O | 0..1 | Represents whether the service API and/or the service API category can be published to other CCFs. |  |
| serviceAPICategory | string | C | 0..1 | The service API category to which the service API belongs to. This attribute is only applicable for CAPIF-6/6e interface.(NOTE 2) |  |
| ccfId | string | C | 0..1 | CCF identifier which can be contacted further for discovering the details of service API information. This attribute is only applicable for CAPIF-6/6e interface and shall be provided with serviceAPICategory.(NOTE 2) |  |
| apiSuppFeats | SupportedFeatures | O | 0..1 | Provided by the consumer to indicate the features supported by the service API. | ApiSupportedFeaturePublishing |
| pubApiPath | PublishedApiPath | C | 0..1 | It contains the published API path within the same CAPIF provider domain. it shall be provided by the CCF when publishing the service API to other CCF via the CAPIF-6 reference point. |  |
| apiProvName | string | O | 0..1 | Represents the API provider name. | RNAA |
| NOTE 1: For the CAPIF\_Publish\_Service\_API, the "supportedFeatures" attribute shall be provided in the HTTP POST request and in the response of successful resource creation and only when feature negotiation needs to take place. When present, the "supportedFeatures" attribute shall include one or more of the supported features as defined in clause 8.2.6.NOTE 2: When this data type is used over the CAPIF-6/6e interface, at least one of the "aefProfiles" attribute or the "serviceAPICategory" attribute (together with the corresponding "ccfId" attribute) shall be present. |

\* \* \* \* Next changes \* \* \* \*

##### 8.2.4.2.11 Type: ServiceAPIDescriptionPatch

Table 8.2.4.2.11-1: Definition of type ServiceAPIDescriptionPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| apiStatus | ApiStatus | O | 0..1 | Indicates the API status. | ApiStatusMonotiring |
| aefProfiles | array(AefProfile) | O | 1..N | Contains AEF profile information, which includes the exposed API details (e.g., protocol).(NOTE) |  |
| description | string | O | 0..1 | Contains a textual description of the service API. |  |
| shareableInfo | ShareableInformation | O | 0..1 | Indicates whether the service API and/or the service API category can be published to other CCFs. |  |
| serviceAPICategory | string | O | 0..1 | Contains the service API category to which the service API belongs. This attribute is only applicable for CAPIF-6/6e interface.(NOTE) |  |
| ccfId | string | O | 0..1 | Contains the CCF identifier which can be contacted further for discovering the details of service API information.This attribute is only applicable for the CAPIF-6/6e interface and shall be present only when the "serviceAPICategory" attribute is also present.(NOTE) |  |
| apiSuppFeats | SupportedFeatures | O | 0..1 | Contains the list of features supported by the service API. | ApiSupportedFeaturePublishing |
| pubApiPath | PublishedApiPath | O | 0..1 | Contains the published API path within the same CAPIF provider domain.This attribute is applicable only over the CAPIF-6 interface. |  |
| NOTE: When this data type is used over the CAPIF-6/6e interface, either the "aefProfiles" attribute or the "serviceAPICategory" attribute (together with the corresponding "ccfId" attribute) may be present. |

\* \* \* \* Next changes \* \* \* \*

### 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. |
| 9 | VendorExt | Indicates the support for CAPIF vendor specific extensions.(NOTE) |
| 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 changes \* \* \* \*

###### 8.3.2.3.3.2 PUT

The PUT method is used to update an existing subscription resource.

The susbcribing entity shall initiate the HTTP PUT request message and the CAPIF core function shall respond to the message.

This method shall support the request data structures specified in table 8.3.2.3.3.2-1 and the response data structures and response codes specified in table 8.3.2.3.3.2-2.

Table 8.3.2.3.3.2-1: Data structures supported by the PUTRequest Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| EventSubscription | M | 1 | Contains the updated representation of the existing individual CAPIF Events Subscription resource. |

Table 8.3.2.3.3.2-2: Data structures supported by thePUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| EventSubscription | M | 1 | 200 OK | The event subscription was successfully updated, and a representation of the updated resource is returned. |
| N/A |  |  | 204 No Content | The event subscription was successfully updated and no content is returned in the reponse body. |
| N/A |  |  | 307 Temporary Redirect | Temporary redirection.The response shall include a Location header field containing an alternative URI of the resource located in an alternative CAPIF core function.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| N/A |  |  | 308 Permanent Redirect | Permanent redirection.The response shall include a Location header field containing an alternative URI of the resource located in an alternative CAPIF core function.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] shall also apply. |

Table 8.3.2.3.3.2-3: 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 CAPIF core function. |

Table 8.3.2.3.3.2-4: 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 CAPIF core function. |

\* \* \* \* Next changes \* \* \* \*

###### 8.3.2.3.3.3 PATCH

The PATCH method allows to modify an existing subscription.

The subscribing entity shall initiate the HTTP PATCH request message and the CAPIF core function shall respond to the message.

This method shall support the request data structures specified in table 8.3.2.3.3.3-1 and the response data structures and response codes specified in table 8.3.2.3.3.3-2.

Table 8.3.2.3.3.3-1: Data structures supported by the PATCHRequest Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| EventSubscriptionPatch | M | 1 | Contains the parameters to request the modification of the existing individual CAPIF Events Subscription resource. |

Table 8.3.2.3.3.3-2: Data structures supported by thePATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| EventSubscription | M | 1 | 200 OK | The subscription was successfully modified and a representation of the updated resource is returned in the response body.  |
| N/A |  |  | 204 No Content | The subscription was successfully modified and no content was returned in the response body. |
| N/A |  |  | 307 Temporary Redirect | Temporary redirection.The response shall include a Location header field containing an alternative URI of the resource located in an alternative CAPIF core function.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| N/A |  |  | 308 Permanent Redirect | Permanent redirection.The response shall include a Location header field containing an alternative URI of the resource located in an alternative CAPIF core function.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] shall also apply. |

Table 8.3.2.3.3.3-3: 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 CAPIF core function. |

Table 8.3.2.3.3.3-4: 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 CAPIF core function. |

\* \* \* \* Next changes \* \* \* \*

##### 8.3.3.2.2 Notification definition

The POST method shall be used for Event notification and the URI shall be the one provided by the Subscriber during the subscription to the event.

Callback URI: **{notificationDestination}**

This method shall support the URI query parameters specified in table 8.3.3.2.2.1-1.

Table 8.3.3.2.2-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 8.3.3.2.2-2 and the response data structures and response codes specified in table 8.3.3.2.2-3.

Table 8.3.3.2.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| EventNotification | M | 1 | Notification information of a CAPIF Event |

Table 8.3.3.2.2-3: 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. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection, during notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative notification destination where the notification should be sent.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection, during notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative notification destination where the notification should be sent.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] also apply. |

Table 8.3.3.2.2-4: 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 notification destination towards which the notification should be redirected. |

Table 8.3.3.2.2-5: 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 notification destination towards which the notification should be redirected. |

\* \* \* \* Next changes \* \* \* \*

#### 8.4.2.1 Overview

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

Figure 8.4.2.1-1 depicts the resource URIs structure for the CAPIF\_API\_Invoker\_Management\_API.



Figure 8.4.2.1-1: Resource URI structure of the CAPIF\_API\_Invoker\_Management\_API

Table 8.4.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.4.2.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| On-boarded API Invokers | /onboardedInvokers(NOTE) | POST | On-boards a new API invoker by creating an API invoker profile |
| Individual On-boarded API Invoker | /onboardedInvokers/{onboardingId}(NOTE) | DELETE | Off-boards an individual API invoker by deleting the associated API invoker profile identified by {onboardingId} |
| PATCH | Modifies the API invoker details of an individual API invoker identified by the {onboardingId} |
| PUT | Updates the API invoker details of an individual API invoker identified by the {onboardingId} |
| NOTE: The path segment "onboardedInvokers" does not follow the related naming convention defined in clause 7.5.1. The path segment is however kept as currently defined in this specification for backward compatibility considerations. |

\* \* \* \* Next changes \* \* \* \*

##### 8.4.3.2.2 Notification definition

The POST method shall be used for Notify\_Onboarding\_Completion and the URI shall be the one provided by the API invoker during the on-boarding request.

Callback URI: **{notificationDestination}**

This method shall support the URI query parameters specified in table 8.4.3.2.2-1.

Table 8.4.3.2.2-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 8.4.3.2.2-2 and the response data structures and response codes specified in table 8.4.3.2.2-3.

Table 8.4.3.2.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| OnboardingNotification | M | 1 | Notification with on-boarding result |

Table 8.4.3.2.2-3: 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. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection, during notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative notification destination where the notification should be sent.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection, during notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative notification destination where the notification should be sent.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] also apply. |

Table 8.4.3.2.2-4: 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 notification destination towards which the notification should be redirected. |

Table 8.4.3.2.2-5: 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 notification destination towards which the notification should be redirected. |

\* \* \* \* Next changes \* \* \* \*

##### 8.4.3.3.2 Notification definition

The POST method shall be used for Notify\_Update\_Completion and the URI shall be the one provided by the API invoker during the API invoker details update request.

Callback URI: **{notificationDestination}**

This method shall support the URI query parameters specified in table 8.4.3.3.2-1.

Table 8.4.3.3.2-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 8.4.3.3.2-2 and the response data structures and response codes specified in table 8.4.3.3.2-3.

Table 8.4.3.3.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| OnboardingNotification | M | 1 | Notification with API Invoker's details update result. |

Table 8.4.3.3.2-3: 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. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection, during notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative notification destination where the notification should be sent.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection, during notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative notification destination where the notification should be sent.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] also apply. |

Table 8.4.3.3.2-4: 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 notification destination towards which the notification should be redirected. |

Table 8.4.3.3.2-5: 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 notification destination towards which the notification should be redirected. |

\* \* \* \* Next changes \* \* \* \*

#### 8.5.2.1 Overview

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

Figure 8.5.2.1-1 depicts the resource URIs structure for the CAPIF\_Security\_API.



Figure 8.5.2.1-1: Resource URI structure of the CAPIF\_Security\_API

Table 8.5.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 8.5.2.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Trusted API invokers | /trustedInvokers(NOTE) | n/a |  |
| Individual trusted API invoker | /trustedInvokers/{apiInvokerId}(NOTE) | GET | Retrieve authentication information of an API invoker |
| PUT | Create a security context for individual API invoker |
| DELETE | Revoke the authorization of the API invoker |
| /trustedInvokers/{apiInvokerId}/update(NOTE) | update (POST) | Update the security context (e.g. re-negotiate the security methods). |
| /trustedInvokers/{apiInvokerId}/delete(NOTE) | delete (POST) | Revoke the authorization of the API invoker for some APIs |
| /securities/{securityId}/token(NOTE) | token (POST) | Obtain the OAuth 2.0 authorization information |
| NOTE: The path segment "trustedInvokers" does not follow the related naming convention defined in clause 7.5.1. The path segment is however kept as currently defined in this specification for backward compatibility considerations. |

\* \* \* \* Next changes \* \* \* \*

###### 8.5.2.3.3.1 GET

This method shall support the URI query parameters specified in table 8.5.2.3.3.1-1.

Table 8.5.2.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| authenticationInfo | boolean | O | 0..1 | When set to "true", it indicates the CCF to send the authentication information of the API invoker. Set to "false" or omitted. (NOTE) |
| authorizationInfo | boolean | O | 0..1 | When set to "true", it indicates the CCF to send the authorization information of the API invoker. Set to "false" indicates the CCF not to send the authorization information of the API invoker. Default value is "false" if omitted. (NOTE) |
| NOTE: The query parameters "authenticationInfo" and "authorizationInfo" do not follow the related naming convention defined in clause 7.5.1. These query parameters are however kept as currently defined in this specification for backward compatibility considerations. |

This method shall support the request data structures specified in table 8.5.2.3.3.1-2 and the response data structures and response codes specified in table 8.5.2.3.3.1-3.

Table 8.5.2.3.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 8.5.2.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| ServiceSecurity | M | 1 | 200 OK | The security related information of the API Invoker based on the request from the API exposing function. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection, during resource retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection, during resource retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative CCF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| NOTE: The mandatory HTTP error status codes for the GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] also apply. |

Table 8.5.2.3.3.1-4: 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 CCF. |

Table 8.5.2.3.3.1-5: 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 CCF. |

\* \* \* \* Next changes \* \* \* \*

##### 8.5.3.2.2 Notification definition

The POST method shall be used for Authorization revoked notification and the URI shall be the one provided by the API invoker during the Obtain\_Security\_Method service operation.

Callback URI: **{notificationDestination}**

This method shall support the URI query parameters specified in table 8.5.3.2.2-1.

Table 8.5.3.2.2-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 8.5.3.2.2-2 and the response data structures and response codes specified in table 8.5.3.2.2-3.

Table 8.5.3.2.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| SecurityNotification | M | 1 | Notification with information related to revoked authorization. |

Table 8.5.3.2.2-3: 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. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection, during notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative notification destination where the notification should be sent.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection, during notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative notification destination where the notification should be sent.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [14]. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] also apply. |

Table 8.5.3.2.2-4: 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 notification destination towards which the notification should be redirected. |

Table 8.5.3.2.2-5: 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 notification destination towards which the notification should be redirected. |

\* \* \* \* Next changes \* \* \* \*

##### 8.5.4.2.6 Type: AccessTokenReq

Table 8.5.4.2.6-1: Definition of type AccessTokenReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| grant\_type | string | M | 1 | This attribute shall contain the grant type as "client\_credentials", or when the "RNAA" feature is supported, either "client\_credentials" or "authorization\_code".(NOTE 3, NOTE 4) |  |
| client\_id | string | M | 1 | This attribute shall contain the API invoker Identifier.(NOTE 3) |  |
| resOwnerId | ResOwnerId | O | 0..1 | Contains the identifier of the resource owner.This attribute shall be present only when the access token request is used for RNAA. | RNAA |
| client\_secret | string | O | 0..1 | This attribute when present shall contain the onboarding secret which is got during API invoker onboarding.(NOTE 3) |  |
| scope | string | O | 0..1 | This attribute when present shall contain a list of AEF identifiers and its associated API names for which the access\_token is authorized for use.It takes the format of 3gpp#aefId1:apiName1,apiName2,…apiNameX;aefId2:apiName1,apiName2,…apiNameY;…aefIdN:apiName1,apiName2,…apiNameZUsing delimiter "#" after the discriminator "3gpp", ":" after AEF identifier, "," between API names and ";" between the last API name of the previous AEF identifier and the next AEF identifier. (NOTE 2) Example: '3gpp#aef-jiangsu-nanjing:3gpp-monitoring-event,3gpp-as-session-with-qos;aef-zhejiang-hangzhou:3gpp-cp-parameter-provisioning,3gpp-pfd-management' |  |
| authCode | string | C | 0..1 | Contains the authorization code.This attribute shall be included only when the access token request is used for RNAA and the OAuth "authorization code" grant type is used. | RNAA |
| redirect\_uri | string | O | 0..1 | Contains the redirection URI that was used to obtain the authorization code provided within the "authCode" attribute.This attribute may be included only when the access token request is used for RNAA and the OAuth "authorization code" grant type is used.(NOTE 3) | RNAA |
| NOTE 1: This data structure shall not be treated as a JSON object. It shall be treated as a key, value pair data structure to be encoded using x-www-urlencoded format as specified in clause 17.13.4.1 of W3C HTML 4.01 Specification [22].NOTE 2: The scope may contain more space-delimited strings which further add additional access ranges to the scope, the definition of those additional strings is out of the scope of the present document.NOTE 3: The "grant\_type", "client\_id", "client\_secret" and "redirect\_uri" attributes do not follow the related naming convention defined in clause 7.2.1. These attributes are however kept as currently defined in this specification in order to keep them aligned with corresponding claims defined in IETF RFC 6749 [23] and for backward compatibility considerations.NOTE 4: The enumeration value "client\_credentials" or "authorization\_code" of the "grant\_type" attribute does not follow the related naming convention defined in clause 7.2.1. This enumeration is however kept as currently defined in this specification for backward compatibility considerations. |  |

\* \* \* \* Next changes \* \* \* \*

#### 8.5.5.1 General

General error responses are defined in clause 7.7.

In addition, the requirements in the following clauses shall apply.

\* \* \* \* Next changes \* \* \* \*

# A.2 CAPIF\_Discover\_Service\_API

openapi: 3.0.0

info:

 title: CAPIF\_Discover\_Service\_API

 description: |

 API for discovering service APIs.

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 version: "1.3.0-alpha.2"

externalDocs:

 description: 3GPP TS 29.222 V18.4.0 Common API Framework for 3GPP Northbound APIs

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

servers:

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

 variables:

 apiRoot:

 default: https://example.com

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

paths:

 /allServiceAPIs:

 get:

 description: >

 Discover published service APIs and retrieve a collection of APIs according

 to certain filter criteria.

 parameters:

 - name: api-invoker-id

 in: query

 description: >

 String identifying the API invoker assigned by the CAPIF core function.

 It also represents the CCF identifier in the CAPIF-6/6e interface.

 required: true

 schema:

 type: string

 - name: api-name

 in: query

 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.

 schema:

 type: string

 - name: api-version

 in: query

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

 schema:

 type: string

 - name: comm-type

 in: query

 description: Communication type used by the API (e.g. REQUEST\_RESPONSE).

 schema:

 $ref: 'TS29222\_CAPIF\_Publish\_Service\_API.yaml#/components/schemas/CommunicationType'

 - name: protocol

 in: query

 description: Protocol used by the API.

 schema:

 $ref: 'TS29222\_CAPIF\_Publish\_Service\_API.yaml#/components/schemas/Protocol'

 - name: aef-id

 in: query

 description: AEF identifer.

 schema:

 type: string

 - name: data-format

 in: query

 description: Data formats used by the API (e.g. serialization protocol JSON used).

 schema:

 $ref: 'TS29222\_CAPIF\_Publish\_Service\_API.yaml#/components/schemas/DataFormat'

 - name: api-cat

 in: query

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

 schema:

 type: string

 - name: preferred-aef-loc

 in: query

 description: The preferred AEF location.

 content:

 application/json:

 schema:

 $ref: 'TS29222\_CAPIF\_Publish\_Service\_API.yaml#/components/schemas/AefLocation'

 - name: req-api-prov-name

 in: query

 description: Represents the required API provider name.

 schema:

 type: string

 - name: supported-features

 in: query

 description: Features supported by the NF consumer for the CAPIF Discover Service API.

 schema:

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

 - name: api-supported-features

 in: query

 description: >

 Features supported by the discovered service API indicated by api-name parameter.

 This may only be present if api-name query parameter is present.

 schema:

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

 - name: ue-ip-addr

 in: query

 description: Represents the UE IP address information.

 schema:

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

 - name: service-kpis

 in: query

 description: >

 Contains iInformation about service characteristics provided by the targeted

 service API(s).

 schema:

 $ref: 'TS29222\_CAPIF\_Publish\_Service\_API.yaml#/components/schemas/ServiceKpis'

 responses:

 '200':

 description: >

 The response body contains the result of the search over the list of registered APIs.

 content:

 application/json:

 schema:

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

 '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'

 '414':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/414'

 '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:

 schemas:

 DiscoveredAPIs:

 type: object

 description: >

 Represents a list of APIs currently registered in the CAPIF core function

 and satisfying a number of filter criteria provided by the API consumer.

 properties:

 serviceAPIDescriptions:

 type: array

 items:

 $ref: 'TS29222\_CAPIF\_Publish\_Service\_API.yaml#/components/schemas/ServiceAPIDescription'

 minItems: 1

 description: >

 Description of the service API as published by the service. Each service

 API description shall include AEF profiles matching the filter criteria.

 suppFeat:

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

 IpAddrInfo:

 type: object

 description: Represents the UE IP address information.

 properties:

 ipv4Addr:

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

 ipv6Addr:

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

 oneOf:

 - required: [ipv4Addr]

 - required: [ipv6Addr]

\* \* \* \* Next changes \* \* \* \*

# 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: "1.3.0-alpha.5"

externalDocs:

 description: 3GPP TS 29.222 V18.5.0 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.

 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.

 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

 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.

\* \* \* \* Next changes \* \* \* \*

\* \* \* \* Next changes \* \* \* \*

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