**3GPP TSG-CT WG3 Meeting #131 *C3-235709***

**Chicago, United States, 13 - 17 November, 2023** **(revision of C3-235154)**

|  |
| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **29.222** | **CR** | **0312** | **rev** | **2** | **Current version:** | **18.3.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

|  |
| --- |
|  |
| ***Title:***  | Authorization code flow for resource owner-aware northbound api access |
|  |  |
| ***Source to WG:*** | CT3 |
| ***Source to TSG:*** | Xiaomi |
|  |  |
| ***Work item code:*** | SNAAPP |  | ***Date:*** | 2023-11-3 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | *Rel-18* |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | As referring to clause 6.5.3.3 of TS 33.122, in resource owner-aware northbound API access (RNAA) scenarios, the authorization code flow defined in clause 4.1 of RFC 6749 is reused. Therefore, the following enhancements should be adopted to support the authorization code flow.In RNAA scenarios, the access token shall include the resource owner ID. However, in TS 29.222, the token does not contain the resource owner information.According to clause 6.5.3.3 of TS 33.122, the authorization code flow defined in clause  4.1 of RFC  6749 is reused. To enable the API invoker to access resources of a specific resource owner via authorization code flow, the API invoker needs to obtain the authorization code before requesting the access token. However, in TS 29.222, there is no existing authorization code realted service operation.Moreover, as described in clause 4.1 of RFC 6749, the API invoker needs to send the authorization code to the CAPIF core function when it requests the access token. However, in TS 29.222, there is no authorization code information in the token related service operation. |
|  |  |
| ***Summary of change:*** | Add the resource owner ID in the accesstokenreq and accesstokenresp data types.Add the authorization code in the accesstokenreq data type.Add the operation related to authorization code. |
|  |  |
| ***Consequences if not approved:*** | This results in CAPIF not supporting the authorization code flow for RNAA. |
|  |  |
| ***Clauses affected:*** | 5.6.2.3.2, 8.5.2.3.4.X(new), 8.5.4.1, 8.5.4.2.x (new), , 8.5.4.2.6, 8.5.4.2.8, A.6 |
|  |  |
|  | **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 a backward compatible feature in CAPIF\_Security\_API. |
|  |  |
| ***This CR's revision history:*** |  |

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

##### 5.6.2.3.1 General

This service operation is used by an API invoker to negotiate and obtain authorization information from the CAPIF core function. The information received by API invoker shall be used for authorization to invoke service APIs exposed by the API exposing function.

##### 5.6.2.3.2 Obtain authorization using Obtain\_Authorization service operation

To obtain authorization information from the CAPIF core function to invoke service APIs, the API invoker shall perform the functions of the resource owner, client and redirection endpoints as described in clause 6.5.2.3 of 3GPP TS 33.122 [16].

The API invoker shall send a POST request to the "Token Endpoint", as described in IETF RFC 6749 [23], clause 3.2. The "Token Endpoint" URI shall be:

{apiRoot}/capif-security/v1/securities/{securityId}/token

where {securityId} is the API invoker identifier and represents the "Individual trusted API invoker" resource created during obtain security method, as described in clause 5.6.2.2.

The body of the HTTP POST request shall indicate that the required OAuth2 grant must be of type "client\_credentials" or "authorization\_code". The grant type shall be set as " authorization\_code " when API invoker uses authorization code flow. The grant type shall be set as "client\_credentials" when API invoker uses client credentials flow. The "scope" parameter (if present) shall include a list of AEF identifiers and its associated API names the API invoker is trying to access (i.e., the API invoker expected scope). If the request is sent for authorization code flow, the request shall include the authorization code.

The API invoker may use HTTP Basic authentication towards this endpoint, using the API invoker identifier as "username" and the onboarding secret as "password". Such username and password may be included in the header or body of the HTTP POST request.

On success, "200 OK" shall be returned. The payload body of the POST response shall contain the requested access token, the token type and the expiration time for the token. The access token shall be a JSON Web Token (JWT) as specified in IETF RFC 7519 [24]. The access token returned by the CAPIF core function shall include the claims encoded as a JSON object as specified in clause 8.5.4.2.8 and then digitally signed using JWS as specified in IETF RFC 7515 [25] and in Annex C.1 of 3GPP TS 33.122 [16].

The digitally signed access token shall be converted to the JWS Compact Serialization encoding as a string as specified in clause 7.1 of IETF RFC 7515 [25].

If the access token request fails at the CAPIF core function, the CAPIF core function shall return "400 Bad Request" status code, including a JSON object in the response payload, that includes details about the specific error that occurred.

##### 5.6.2.3.x Obtain authorization code using Obtain\_Authorization service operation

This service operation is used by the API invoker to obtain the authorization code from the CAPIF core function.

If the API invoker uses the authorization code flow, the API invoker shall send a GET request to the "Authorization Endpoint", as described in IETF RFC 6749 [23], clause 4.1. The "Authorization Endpoint" URI shall be:

{apiRoot}/capif-security/v1/securities/{securityId}/code

where {securityId} is the API invoker identifier and represents the "Individual trusted API invoker" resource created during obtain security method, as described in clause 5.6.2.2.

As per clause 4.1 of IETF RFC 6749 [23], the HTTP GET request shall indicate the response type as type "code" and other required parameters within query parameters. The "resource\_owner\_id" parameter shall include the resource owner ID.

The API invoker may use HTTP Basic authentication towards this endpoint, using the API invoker identifier as "username" and the onboarding secret as "password". Such username and password may be included in the header or body of the HTTP GET request.

On success, "302 Found" shall be returned. The payload body of the GET response shall contain the requested authorization code, as described in clause 4.1 IETF RFC 6749 [23].

Editor's Note: More details on Obtain\_Authorization\_Code service operation are FFS.

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

###### 8.5.2.3.4.X Operation: code

8.5.2.3.4.X.1 Description

This custom operation obtains authorization code from an existing Individual security instance resource in the CAPIF core function.

8.5.2.3.4.X.2 Operation Definition

This method shall support the URI query parameters specified in table 8.5.2.3.4.X.2-1.

Table 8.5.2.3.4.X.2-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| response-type | string | M | 1 | The response type shall be set as "code" as defined in clause 4.1.1 of IETF 6749 [23] |
| api-invoker-id | string | M | 1 | String identifying the API invoker as defined as client\_id in clause 4.1.1 of IETF 6749 [23] |
| resource-owner-id | string | O | 0..1 | String identifying resource owner as defined in clause 6.5.3.3 of TS 33.122 [16] |

This method shall support the request data structures specified in table 8.5.2.3.4.X.2-2 and the response data structures and response codes specified in table 8.5.2.3.4.X.2-3.

Table 8.5.2.3.4.X -2: Data structures supported by the GET Request Body on this resource

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

Table 8.5.2.3.4.X -3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| AuthorizationCodeRsp | M  | 1 | 302 Found | Authorization code requested by the API invoker. |
| 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 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, during resource retrieval. 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 GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [14] also apply. |

Table 8.5.2.3.4.X -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 CAPIF core function. |

Table 8.5.2.3.4.X -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 CAPIF core function. |

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

#### 8.5.4.1 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 8.5.4.1-1 specifies the data types defined specifically for the CAPIF\_Security\_API service.

Table 8.5.4.1-1: CAPIF\_Security\_API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| AccessTokenClaims | Clause 8.5.4.2.8 | Represents the claims data structure for the access token. |  |
| AccessTokenErr | Clause 8.5.4.2.9 | Represents an error in the access token request. |  |
| AccessTokenReq | Clause 8.5.4.2.6 | Represents the access token request information. |  |
| AccessTokenRsp | Clause 8.5.4.2.7 | Represents the access token response information. |  |
| Cause | Clause 8.5.4.3.3 | Indicates the cause for revoking the API invoker's authorization to the service API. |  |
| SecurityInformation | Clause 8.5.4.2.3 | Represents the interface details and the security method. |  |
| SecurityNotification | Clause 8.5.4.2.5 | Represents the revoked authorization notification details. |  |
| ServiceSecurity | Clause 8.5.4.2.2 | Represents the details of the security method for each service API interface. When included by the API invoker, it shall indicate the preferred method of security. When included by the CAPIF core function, it shall indicate the security method to be used for the service API interface. |  |
| AuthorizationCodeRsp | Clause 8.5.4.2.X | Represents the authorization code response information. |  |

Editor's Note: Details on AuthorizationCodeRsp are FFS.

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

##### 8.5.4.2.X Type: AuthorizationCodeRsp

Table 8.5.4.2.7-1: Definition of type AuthorizationCodeRsp

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| authCode | string | M | 1 | This IE shall contain authorization code.  |

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

##### 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 IE shall contain the grant type as "client\_credentials" or "authorization\_code".The grant type shall be set as "authorization\_code" when API invoker uses authorization authorization code flow.The grant type shall be set as "client\_credentials" when API invoker uses client credentials flow.(NOTE 3, NOTE 4) |  |
| client\_id | string | M | 1 | This IE shall contain the API invoker Identifier.(NOTE 3) |  |
| resource\_owner\_id | string | O | 0..1 | This IE shall contain the resource owner ID.  | RNAA |
| client\_secret | string | O | 0..1 | This IE when present shall contain the onboarding secret which is got during API invoker onboarding.(NOTE 3) |  |
| scope | string | O | 0..1 | This IE 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 delimeter "#" 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 | O | 0..1 | This IE shall be included If the authorization code flow is selected in RNAA scenarios. This IE when present shall contain authorization code. | 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" and "client\_secret" attributes do not follow the related naming convention defined in subclause 7.2.1. These attributes are however kept as currently defined in this specification for backward compatibility considerations.NOTE 4: The enumeration value "client\_credentials" of the "grant\_type" attribute does not follow the related naming convention defined in subclause 7.2.1. This enumeration is however kept as currently defined in this specification for backward compatibility considerations. |  |

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

##### 8.5.4.2.8 Type: AccessTokenClaims

Table 8.5.4.2.8-1: Definition of type AccessTokenClaims

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| iss | string | M | 1 | This IE shall contain the API invoker Identifier. |  |
| scope | string | M | 1 | This IE 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 delimeter "#" 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)Example: '3gpp#aef-jiangsu-nanjing:3gpp-monitoring-event,3gpp-as-session-with-qos;aef-zhejiang-hangzhou:3gpp-cp-parameter-provisioning,3gpp-pfd-management' |  |
| exp | DurationSec | M | 1 | This IE shall contain the number of seconds after which the access\_token is considered to be expired. |  |
| resource\_owner\_id | string | O | 0..1 | This IE shall contain the resource owner ID. | RNAA |
| NOTE: 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 x: The resource\_owner\_id and authCode are only applicable to the RNAA feature. |

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

### 8.5.6 Feature negotiation

General feature negotiation procedures are defined in clause 7.8. Table 8.5.6-1 lists the supported features for CAPIF\_Security\_API.

Table 8.5.6-1: Supported Features

|  |  |  |
| --- | --- | --- |
| **Feature number** | **Feature Name** | **Description** |
| 1 | Notification\_test\_event | Testing of notification connection is supported according to clause 7.6. |
| 2 | Notification\_websocket | The delivery of notifications over Websocket is supported according to clause 7.6. This feature requires that the Notification\_test\_event feature is also supported. |
| 3 | SecurityInfoPerAPI | Indicates the support of negotiating and obtaining service API security method information per API. |
| x | RNAA | Indicates the support of resource owner awareness authorization. |

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

# A.6 CAPIF\_Security\_API

openapi: 3.0.0

info:

 title: CAPIF\_Security\_API

 description: |

 API for CAPIF security management.

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 version: "1.3.0-alpha.2"

externalDocs:

 description: 3GPP TS 29.222 V18.1.0 Common API Framework for 3GPP Northbound APIs

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

servers:

 - url: '{apiRoot}/capif-security/v1'

 variables:

 apiRoot:

 default: https://example.com

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

paths:

 /trustedInvokers/{apiInvokerId}:

 get:

 parameters:

 - name: apiInvokerId

 in: path

 description: Identifier of an individual API invoker

 required: true

 schema:

 type: string

 - name: authenticationInfo

 in: query

 description: >

 When set to 'true', it indicates the CAPIF core function to send the

 authentication information of the API invoker. Set to false or omitted otherwise.

 schema:

 type: boolean

 - name: authorizationInfo

 in: query

 description: >

 When set to 'true', it indicates the CAPIF core function to send the

 authorization information of the API invoker. Set to false or omitted otherwise.

 schema:

 type: boolean

 responses:

 '200':

 description: >

 The security related information of the API Invoker based on the request

 from the API exposing function.

 content:

 application/json:

 schema:

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

 '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'

 put:

 parameters:

 - name: apiInvokerId

 in: path

 description: Identifier of an individual API invoker

 required: true

 schema:

 type: string

 requestBody:

 description: create a security context for an API invoker

 required: true

 content:

 application/json:

 schema:

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

 callbacks:

 notificationDestination:

 '{request.body#/notificationDestination}':

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: No Content (successful notification)

 '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'

 responses:

 '201':

 description: Successful created.

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: >

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

 {apiRoot}/capif-security/v1/trustedInvokers/{apiInvokerId}

 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'

 '411':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/413'

 '414':

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

 '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:

 parameters:

 - name: apiInvokerId

 in: path

 description: Identifier of an individual API invoker

 required: true

 schema:

 type: string

 responses:

 '204':

 description: No Content (Successful deletion of the existing subscription)

 '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'

 /trustedInvokers/{apiInvokerId}/update:

 post:

 parameters:

 - name: apiInvokerId

 in: path

 description: Identifier of an individual API invoker

 required: true

 schema:

 type: string

 requestBody:

 description: Update the security context (e.g. re-negotiate the security methods).

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '200':

 description: Successful updated.

 content:

 application/json:

 schema:

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

 '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'

 /trustedInvokers/{apiInvokerId}/delete:

 post:

 parameters:

 - name: apiInvokerId

 in: path

 description: Identifier of an individual API invoker

 required: true

 schema:

 type: string

 requestBody:

 description: Revoke the authorization of the API invoker for APIs.

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: Successful revoked.

 '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'

 /securities/{securityId}/token:

 post:

 parameters:

 - name: securityId

 in: path

 description: Identifier of an individual API invoker

 required: true

 schema:

 type: string

 requestBody:

 required: true

 content:

 application/x-www-form-urlencoded:

 schema:

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

 responses:

 '200':

 description: Successful Access Token Request

 content:

 application/json:

 schema:

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

 '307':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/308'

 '400':

 description: Error in the Access Token Request

 content:

 application/json:

 schema:

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

 '401':

 description: Unauthorized

 content:

 application/json:

 schema:

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

components:

 schemas:

 ServiceSecurity:

 type: object

 description: >

 Represents the details of the security method for each service API interface.

 When included by the API invoker, it indicates the preferred method of security.

 When included by the CAPIF core function, it indicates the security method to be

 used for the service API interface.

 properties:

 securityInfo:

 type: array

 items:

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

 minimum: 1

 notificationDestination:

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

 requestTestNotification:

 type: boolean

 description: >

 Set to true by API invoker to request the CAPIF core function to send a

 test notification as defined in in clause 7.6. Set to false or omitted otherwise.

 websockNotifConfig:

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

 supportedFeatures:

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

 required:

 - securityInfo

 - notificationDestination

 SecurityInformation:

 type: object

 description: Represents the interface details and the security method.

 properties:

 interfaceDetails:

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

 aefId:

 type: string

 description: Identifier of the API exposing function

 apiId:

 type: string

 description: API identifier

 prefSecurityMethods:

 type: array

 items:

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

 minItems: 1

 description: Security methods preferred by the API invoker for the API interface.

 selSecurityMethod:

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

 authenticationInfo:

 type: string

 description: Authentication related information

 authorizationInfo:

 type: string

 description: Authorization related information

 required:

 - prefSecurityMethods

 oneOf:

 - required: [interfaceDetails]

 - required: [aefId]

 SecurityNotification:

 type: object

 description: Represents the revoked authorization notification details.

 properties:

 apiInvokerId:

 type: string

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

 aefId:

 type: string

 description: String identifying the AEF.

 apiIds:

 type: array

 items:

 type: string

 minItems: 1

 description: Identifier of the service API

 cause:

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

 required:

 - apiInvokerId

 - apiIds

 - cause

 AccessTokenReq:

 format: x-www-form-urlencoded

 description: Represents the access token request information.

 properties:

 grant\_type:

 type: string

 enum:

 - client\_credentials

 client\_id:

 type: string

 resource\_owner\_id:

 type: string

 client\_secret:

 type: string

 scope:

 type: string

 authCode:

 type: string

 required:

 - grant\_type

 - client\_id

 AccessTokenRsp:

 type: object

 description: Represents the access token response information.

 properties:

 access\_token:

 type: string

 description: >

 JWS Compact Serialized representation of JWS signed JSON object (AccessTokenClaims)

 token\_type:

 type: string

 enum:

 - Bearer

 expires\_in:

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

 scope:

 type: string

 required:

 - access\_token

 - token\_type

 - expires\_in

 AccessTokenClaims:

 type: object

 description: Represents the claims data structure for the access token.

 properties:

 iss:

 type: string resource\_owner\_id:

 type: string scope:

 type: string

 exp:

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

 required:

 - iss

 - scope

 - exp

 AccessTokenErr:

 type: object

 description: Represents an error in the access token request.

 properties:

 error:

 type: string

 enum:

 - invalid\_request

 - invalid\_client

 - invalid\_grant

 - unauthorized\_client

 - unsupported\_grant\_type

 - invalid\_scope

 error\_description:

 type: string

 error\_uri:

 type: string

 required:

 - error

 AuthorizationCodeRsp:

 type: object

 description: Represents the authorization code response information.

 properties:

 authCode:

 type: string

 required:

 - authCode

 Cause:

 anyOf:

 - type: string

 enum:

 - OVERLIMIT\_USAGE

 - UNEXPECTED\_REASON

 - 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 cause for revoking the API invoker's authorization to the service API.

 Possible values are:

 - OVERLIMIT\_USAGE:

 The revocation of the authorization of the API invoker is due to the overlimit

 usage of the service API

 - UNEXPECTED\_REASON:

 The revocation of the authorization of the API invoker is due to unexpected reason.

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