**3GPP TSG-CT WG4 Meeting #102-eC4-211xyz**

**E-Meeting, 24th Feb – 5th Mar 2021 (was C4-211292)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.501** | **CR** | **0099** | **rev** | **1** | **Current version:** | **17.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
|  | | | | | | | | |

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

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | SBI TS Template Update | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, Huawei | | | | | | | | | |
| ***Source to TSG:*** | CT4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | SBIProtoc17 | | | | |  | ***Date:*** | | | 2021-02-15 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In the SBI TS Template (29.xxx-SBI-Stage3-Template.doc), when the content of clause 6.1.2.3 "HTTP custom headers" was created, there were only mandatory HTTP custom header fields defined in TS 29.500 (in clause 5.2.2.3.2).  Later on, some common optional HTTP custom headers were defined in TS 29.500 (in clause 5.2.2.3.3), so they should also be mentioned in each SBI TS.  It is proposed to add text in the SBI TS Template to reflect such reference to common optional headers. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | - Add a reference in clause 6.1.2.3 of the SBI TS Template to the clause in TS 29.500 that covers common HTTP custom headers.  - Several editorial corrections | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Each SBI TS needs to add an explicit mention to common optional custom headers, and this could be easily overlooked. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | File: 29.xxx-SBI-Stage3-Template.doc (Clauses 6.1.2.2.2, 6.1.2.3, 6.1.3.1, 6.1.3.2.2, 6.1.3.2.3.1, 6.1.4.1, 6.1.6.2.2, 6.1.6.5.1, 6.1.6.5.2, A.1, A.2) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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's revision history:*** | |  | | | | | | | | |

\* \* \* For information \* \* \* \*

Annex A (informative):  
TS Skeleton Template

A TS Skeleton Template to be used as a starting point of drafting a 5G System SBI Stage 3 specification is available at the following location:

https://www.3gpp.org/ftp/information/All\_Templates/29.xxx-SBI-Stage3-Template.zip

\* \* \* First Change (on 29.xxx-SBI-Stage3-Template.doc) \* \* \* \*

##### 6.1.2.2.2 Content type

This clause will indicate the encoding of HTTP requests/responses and the applicable MIME media type for the related Content-Type header. Adjust the text below if additional payload types are used e.g. for HATEOAS.

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

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

\* \* \* Next Change (on 29.xxx-SBI-Stage3-Template.doc) \* \* \* \*

#### 6.1.2.3 HTTP custom headers

The mandatory HTTP custom header fields specified in clause 5.2.3.2 of 3GPP TS 29.500 [4] shall be supported, and the optional HTTP custom header fields specified in clause 5.2.3.3 of 3GPP TS 29.500 [4] may be supported.

Add specific information for the API if applicable.

\* \* \* Next Change (on 29.xxx-SBI-Stage3-Template.doc) \* \* \* \*

#### 6.1.3.1 Overview

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

Example:



Figure 6.1.3.1-1: Resource URI structure of the <xyz > API

Table 6.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.1.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| <Resource name> | <relative URI below root> | GET | <Operation executed by GET> |
| PUT | <Operation executed by PUT> |
| PATCH | <Operation executed by PATCH> |
| POST | <Operation executed by POST> |
| DELETE | <Operation executed by DELETE> |
| Custom operation | <Operation executed by custom operation> |

\* \* \* Next Change (on 29.xxx-SBI-Stage3-Template.doc) \* \* \* \*

##### 6.1.3.2.2 Resource Definition

This clause will describe the Resource URI and the supported resource variables.

Resource URI: **{apiRoot}/<apiName>/<apiVersion>/xxx**

This resource shall support the resource URI variables defined in table 6.1.3.2.2-1.

Table 6.1.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.1.1 |
| apiVersion | string | See clause 6.1.1 |
| <name> | <type> | <definition> |

\* \* \* Next Change (on 29.xxx-SBI-Stage3-Template.doc) \* \* \* \*

###### 6.1.3.2.3.1 < method 1 >

This clause will specify the meaning of the method applied on the resource.

This method shall support the URI query parameters specified in table 6.1.3.2.3.1-1.

Table 6.1.3.2.3.1-1: URI query parameters supported by the <method 1> method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| <name> or n/a | <type> or <leave empty> | <M, C or O> | 0..1 or 1 or 0..N or 1..N or <leave empty> | <only if applicable> |  |

This method shall support the request data structures specified in table 6.1.3.2.3.1-2 and the response data structures and response codes specified in table 6.1.3.2.3.1-3.

Table 6.1.3.2.3.1-2: Data structures supported by the <method 1> Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| "<type>" or "array*(<type>*)" or "map*(<type>*)" or n/a | "M", "C" or "O" | "0..1", "1", or "M..N", or <leave empty> | <only if applicable> |

Table 6.1.3.2.3.1-3: Data structures supported by the <method 1> Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| "*<type>*" or "array*(<type>*)" or "map*(<type>*)" or n/a | "M", "C" or "O" | "0..1", "1", or "M..N", or <leave empty> | <list applicable codes with name from the applicable RFCs> | <Meaning of the success case>  or  <Meaning of the error case with additional statement regarding error handling> |
| NOTE: The manadatory HTTP error status code for the <method 1> method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. | | | | |

Table 6.1.3.2.3.1-4: Headers supported by the <e.g. GET> method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| <header name> | <data type>  e.g. string | "M", "C" or "O" | "0..1", "1", "1..N", "1..N", or <leave empty> | <description> |

Table 6.1.3.2.3.1-5: Headers supported by the <e.g. 200> response code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| <header name> | <data type>  e.g. string | "M", "C" or "O" | "0..1", "1", "1..N", "1..N", or <leave empty> | <description> |

Table 6.1.3.2.3.1-6: Links supported by the 200 Response Code on this endpoint

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Resource name | HTTP method or custom operation | Link parameter(s) | Description |
| <link name>  e.g. search | <resource 1>  e.g. Stored Search (Document) | <method 1>  e.g. GET | <parameter>  e.g. searchId | <description of the link> |

\* \* \* Next Change (on 29.xxx-SBI-Stage3-Template.doc) \* \* \* \*

#### 6.1.4.1 Overview

This clause will specify custom operations without any associated resource (i.e. RPC) supported by this API.

Table 6.1.4.1-1: Custom operations without associated resources

|  |  |  |
| --- | --- | --- |
| Custom operation URI | Mapped HTTP method | Description |
| <custom operation URI> | e.g.POST | <Operation executed by Custom operation> |
|  |  |  |

\* \* \* Next Change (on 29.xxx-SBI-Stage3-Template.doc) \* \* \* \*

##### 6.1.6.2.2 Type: <TypeName 1>

"Attribute name": Name of attributes that belong to the specified data type. The attribute names within a structured data type shall be unique, and their relative order inside the structured data type shall not imply any specific ordering of the corresponding JSON member names in a JSON object.

"Data type": Data type of the attribute values. If the data type is indicated as "<type>", the attribute value shall be of data type <type>. If the data type is indicated as "array(<type>)", the attribute value shall be an array (see IETF RFC 825]) that contains elements of data type <type>. If the data type is indicated as "map(<type>)", the attribute value shall be an object (see IETF RFC 8259) encoded in the corresponding OpenAPI specification as a map which values are data type <type>. <type> can either be "integer", "number", "string" or "boolean" (as defined in the OpenAPI specification [4]), or a data type defined in a 3GPP specification.

"P": Presence condition of a data structure in request body. It shall be one of "M" (for Mandatory), "C" (for Conditional) and "O" (for Optional).

"Cardinality": Defines the allowed number of occurrence of data type <type>. A cardinality of "M..N", is only allowed for data types "array(<type>)" and "map(<type>)" and indicates the number of elements within the array or map; the values M and N can either be the characters "M" and "N", respectively, or integer numbers; with M being greater than or equal 0, and N being greater than 0 and M. For data type "<type>", the cardinality shall be set to "0..1" if the Presence condition is "C" or "O", and to "1" if the Presence condition is "M".

"Description": Describes the meaning and use of the attribute and may contain normative statements..

Applicability: If the attribute is only applicable for optional feature(s) negotiated using the mechanism defined in clause 6.6 of 3GPP TS 29.500 [4], the name of the corresponding feature(s) shall be indicated in this column. If no feature is indicated. the attribute can be used with any feature.If no optional features are defined for an API, the applicability column can be omitted for that API

Table 6.1.6.2.2-1: Definition of type <TypeName 1>

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| <*attribute name*> | "*<type>*" or "array*(<type>*)" or "map*(<type>*)" | "M", "C" or "O" | "0..1", "1" or "M..N" | <only if applicable> |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

\* \* \* Next Change (on 29.xxx-SBI-Stage3-Template.doc) \* \* \* \*

##### 6.1.6.5.1 Binary Data Types

Table 6.1.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
| < Binary Data 1 >  e.g. N1 SM Message | < clause >  e.g. 6.1.6.5.2 | <content type>  e.g. vnd.3gpp.5gnas |
|  |  |  |

##### 6.1.6.5.2 < Binary Data 1 >

And so on if there are more binary data to specify

\* \* \* Next Change (on 29.xxx-SBI-Stage3-Template.doc) \* \* \* \*

## A.1 General

This Annex specifies the formal definition of the API(s) defined in the present specification. It consists of OpenAPI specifications in YAML format.

This Annex takes precedence when being discrepant to other parts of the specification with respect to the encoding of information elements and methods within the API(s).

NOTE 1: The semantics and procedures, as well as conditions, e.g. for the applicability and allowed combinations of attributes or values, not expressed in the OpenAPI definitions but defined in other parts of the specification also apply.

Informative copies of the OpenAPI specification files contained in this 3GPP Technical Specification are available on a Git-based repository that uses the GitLab software version control system (see 3GPP TS 29.501 [5] clause 5.3.1 and 3GPP TR 21.900 [7] clause 5B).

\* \* \* Next Change (on 29.xxx-SBI-Stage3-Template.doc) \* \* \* \*

## A.2 <Service 1> API

Where <Service 1> is to be replaced by the name of the Service (e.g. Nsmf\_PDUSession).

One clause is introduced per Service, with the corresponding OpenAPI 3.0.0 Document.

openapi: 3.0.0

info:

title: <API Name>

version: 1.0.0-alpha.1

description: |

<API Name> Service.

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externalDocs:

description: 3GPP TS 29.<xxx> V<x.y.z>; <TS Name>.

url: http://www.3gpp.org/ftp/Specs/archive/29\_series/29.xxx/

servers:

- url: '{apiRoot}/<API name in lower letters with underscores>/v1'

variables:

apiRoot:

default: https://example.com

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

security:

- {}

- oAuth2ClientCredentials:

- <API name in lower letters with undesrscores>

paths:

# API specific definitions , below is an example

/subscriptions:

post:

summary: subscribe to notifications

operationId: CreateIndividualSubcription

tags:

- Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'201':

description: Success

content:

application/json:

schema:

$ref: '#/components/schemas/<xxx>'

headers:

Location:

description: 'Contains the URI of the newly created resource, according to the structure: {apiRoot}/<API name in lower letters with underscores>/<version>/subscriptions/{subId}'

required: true

schema:

type: string

'400':

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

'401':

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

'403':

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

'404':

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

'411':

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

'413':

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

'415':

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

'429':

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

'500':

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

'503':

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

default:

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

callbacks:

myNotification:

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

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/<yyy>'

responses:

'204':

description: No Content, Notification was succesfull

'400':

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

'401':

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

'403':

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

'404':

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

'411':

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

'413':

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

'415':

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

'429':

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

'500':

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

'503':

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

default:

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

/subscriptions/{subId}:

get:

summary: retrieve subscription

operationId: GetIndividualSubcription

tags:

- IndividualSubscription (Document)

parameters:

- name: subId

in: path

description: Event Subscription ID

required: true

schema:

type: string

responses:

'200':

description: OK. Resource representation is returned

content:

application/json:

schema:

$ref: '#/components/schemas/<xxx>'

'400':

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

'401':

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

'403':

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

'404':

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

'406':

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

'429':

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

'500':

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

'503':

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

default:

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

put:

summary: update subscription

operationId: ReplaceIndividualSubcription

tags:

- IndividualSubscription (Document)

tags:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/<xxx>'

parameters:

- name: subId

in: path

description: Event Subscription ID

required: true

schema:

type: string

responses:

'200':

description: OK. Resource was succesfully modified and representation is returned

content:

application/json:

schema:

$ref: '#/components/schemas/<xxx>'

'204':

description: No Content. Resource was succesfully modified

'400':

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

'401':

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

'403':

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

'404':

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

'411':

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

'413':

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

'415':

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

'429':

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

'500':

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

'503':

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

default:

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

delete:

summary: unsubscribe from notifications

operationId: DeleteIndividualSubcription

tags:

- IndividualSubscription (Document)

parameters:

- name: subId

in: path

description: Event Subscription ID

required: true

schema:

type: string

responses:

'204':

description: No Content. Resource was succesfully deleted

'400':

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

'401':

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

'403':

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

'404':

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

'429':

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

'500':

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

'503':

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

default:

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

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{nrfApiRoot}/oauth2/token'

scopes:

<API name in lower letters with underscores>: Access to the <API Name> API

schemas:

# API specific definitions

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