**3GPP TSG CT WG3 Meeting #135 *C3-243224***

**Hyderabad, IN, 27 - 31 May, 2024 *(Revision of C3-243xxx)***

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** | **-** | **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 |  | Radio Access Network |  | Core Network | **x** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Corrections on Npcf\_AMPolicyAuthorization API | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | SBIProtoc18 | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***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 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The following issues have been identified in the current specification:   1. The format of the URI is incorrect in clauses 5.3.1, 5.3.2.3.1. 2. The clause number of AmTerminationCause data type is incorrect in clause 5.6.1. 3. Based on the description in clause 4.2.2.2 as follow, the "events" attribute should be provided if applicable. Hence, in Table 5.6.2.4, the condition of the presence should be stated.   *The NF service consumer shall include within the "evSubsc" attribute:*  *- the notification URI where the NF service consumer receives the events notification encoded as "eventNotifUri" attribute; and*  *- the events to subscribe to in the "events" attribute.*   1. Additional editorial and format issues. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Fix the above issues. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incorrect specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.2.5.3, 5.3.1, 5.3.2.3.1, 5.6.1, 5.6.2.4, 5.7.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 does not impact on the OpenAPI file. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

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

#### 4.2.5.3 Subscription to events without an existing AF application AM context

This procedure is used by an NF service consumer (e.g. 5G DDNMF) to request the creation of a subscription to event(s) in the PCF when no "Individual application AM context" exists, and the NF service consumer does not provide Access and Mobility related service information, i.e., does not create an AF application AM context.

Figure 4.2.5.3-1 illustrates the subscription to event(s) without an existing AF application AM context.



Figure 4.2.5.3-1: Subscription to events without an existing AF application AM context

When an NF service consumer (e.g. 5G DDNMF) decides to create a subscription to one or more event(s), and the NF service consumer is not providing Access and Mobility related service information and the "Individual application AM context" resource does not exist, the NF service consumer shall invoke the Npcf\_AMPolicyAuthorization\_Subscribe service operation to create an "Individual application AM context" resource and the corresponding "AM Policy Events Subscription" sub-resource by sending an HTTP POST request to the resource URI representing the "Application AM contexts" collection resource of the PCF, as shown in figure 4.2.5.3-1, step 1.

The NF service consumer shall include in the AppAmContextData data type in the content of the HTTP POST request a partial representation of the "Individual Application AM Context" resource, which shall include:

- the notification URI where the PCF shall request the termination of the application AM context to the NF service consumer, encoded as "termNotifUri" attribute;

- the SUPI encoded as "supi" attribute; and

- the "evSubsc" attribute to subscribe to notifications of access and mobility policy changes events. The NF service consumer shall include within the associated AmEventsSubscData data type:

a. the notification URI where the NF service consumer wants to receive the event notifications, encoded as "eventNotifUri" attribute; and

b. the event(s) to subscribe to within the "events" attribute. For each subscribed event, the AmEventData data type shall include the event identifier in the "event" attribute and may include the description of the event reporting mode as specified in clause 4.2.5.2.

The event(s) subscription data is provisioned in the "AM Policy Events Subscription" sub-resource.

If the PCF cannot successfully fulfil the received HTTP POST request due to the internal PCF error or due to the error in the HTTP POST request, the PCF shall send the HTTP error response as specified in clause 5.7.

Otherwise, the PCF shall perform the association of the AF request to one and only one AM policy association or UE policy association. If the PCF fails in executing the binding with the AM policy association or UE policy association, the PCF shall reject the HTTP POST request with an HTTP "500 Internal Server Error" response and may include the "cause" attribute set to "POLICY\_ASSOCIATION\_NOT\_AVAILABLE".

NOTE 1: In this release of the specification whether the AF request is associated to an AM policy association or to a UE policy association is determined per specific event, e.g., a subscription to PDUID changes implies the binding to a UE policy association.

If the PCF created an "Individual Application AM Context" resource and the corresponding "AM Policy Events Subscription" sub-resource, the PCF shall send to the NF service consumer a "201 Created" response to the HTTP POST request, as shown in figure 4.2.5.3-1, step 2. The PCF shall include in the "201 Created" response:

- a Location header field; and

- an AppAmContextRespData data type in the content.

The Location header field shall contain the URI of the created "AM Policy Events Subscription" sub-resource, i.e., "{apiRoot}/npcf-am-policyauthorization/<apiVersion>/app-am-contexts/{appAmContextId}/events-subscription".

The AppAmContextRespData data type in the response content shall contain:

- the representation of the created "Individual application AM context" resource within the AppAmContextData data type, which shall also include the "AM Policy Events Subscription" sub-resource representation within the "evSubsc" attribute; and

- when the PCF determines that the subscribed event(s) is already met and/or the NF service consumer requested immediate reporting and the current value is available, the AppAmContextRespData data type shall include the corresponding event(s) notification within the "repEvents" attribute of the AmEventsNotification data type.

NOTE 2: The created "Individual application AM context" resource does not include Access and Mobility related service information, only includes the information supplied by the NF service consumer to perform the association to the concerned AM policy association or UE policy association, i.e., the "supi" attribute, the SBI handling specific properties, i.e. the "suppFeat" attribute and the "termNotifUri" attribute, together with the "evSubsc" attribute.

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

### 5.3.1 Overview

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

Figure 5.3.1-1 depicts the resource URIs structure for the Npcf\_AMPolicyAuthorization API.



Figure 5.3.1-1: Resource URI structure of the Npcf\_AMPolicyAuthorization API

Table 5.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 5.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Application AM contexts | /app-am-contexts | POST | Npcf\_AMPolicyAuthorization\_Create. Creates a new Individual application AM context resource and may create the child AM Policy Events Subscription sub-resource. |
| Individual application AM context | /app-am-contexts/{appAmContextId} | PATCH | Npcf\_AMPolicyAuthorization\_Update. Updates an existing Individual application AM context resource. It can also create or update an AM Policy Events Subscription sub-resource. |
| GET | Reads an existing Individual application AM context resource. |
| DELETE | Npcf\_AMPolicyAuthorization\_Delete. Deletes an existing Individual application AM context resource and the child AM Policy Events Subscription sub-resource. |
| AM Policy Events Subscription | /app-am-contexts/{appAmContextId}/events-subscription | PUT | Npcf\_AMPolicyAuthorization\_Subscribe. Creates a new AM Policy Events Subscription sub-resource or modifies an existing AM Policy Events Subscription sub-resource. |
| DELETE | Npcf\_AMPolicyAuthorization\_Unsubscribe.  Deletes an AM Policy Events Subscription sub-resource. |

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

##### 5.3.2.3.1 POST

This method shall support the URI query parameters specified in table 5.3.2.3.1-1.

Table 5.3.2.3.1-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 5.3.2.3.1-2 and the response data structures and response codes specified in table 5.3.2.3.1-3.

Table 5.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| AppAmContextData | M | 1 | Contains the information for the creation of a new Individual application AM context resource. |

Table 5.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| AppAmContextRespData | M | 1 | 201 Created | Successful case.  The creation of an Individual application AM context resource is confirmed and a representation of that resource is returned, together with event subscription and event notification information, if available, as specified in clause 4.2.2.2. |
| ProblemDetails | O | 0..1 | 500 Internal Server Error | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status code for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.  NOTE 2: Failure cases are described in clause 5.7. | | | | |

Table 5.3.2.3.1-4: Headers supported by the 201 response code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/npcf-am-policyauthorization/<apiVersion>/app-am-contexts/{appAmContextId} |

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

### 5.6.1 General

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

Table 5.6.1-1 specifies the data types defined for the Npcf\_AMPolicyAuthorization service based interface protocol.

Table 5.6.1-1: Npcf\_AMPolicyAuthorization specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| AmEvent | 5.6.3.3 | It represents the event the PCF can notify to the NF service consumer. |  |
| AmEventNotification | 5.6.2.9 | Represents the notification of an event. |  |
| AmEventData | 5.6.2.8 | It contains the event identifier and the related event reporting information. |  |
| AmEventsNotification | 5.6.2.5 | It describes the notification about the events occurred within an Individual application AM context resource. |  |
| AmEventsSubscData | 5.6.2.4 | It represents the AM Policy Events Subscription resource and identifies the events the application subscribes to. |  |
| AmEventsSubscDataRm | 5.6.2.7 | This data type is defined in the same way as the "AmEventsSubscData" data type, but with the OpenAPI "nullable: true" property. |  |
| AmEventsSubscRespData | 5.6.4.2 | It represents a response to an AM Policy Events Subscription request and contains the created/updated AM Policy Events Subscription resource. It may also include the Notification of the events met at the time of subscription.  It is represented as a non-exclusive list of two data types: AmEventsSubscData and AmEventsNotification. |  |
| AmTerminationCause | 5.6.3.4 | It represents the cause values that the PCF should report when requesting to an NF service consumer the deletion of an "AF application AM context" resource. |  |
| AmTerminationInfo | 5.6.2.6 | It includes information related to the termination of the Individual Application AM Context resource. |  |
| AppAmContextData | 5.6.2.2 | It represents an Individual application AM context resource. |  |
| AppAmContextRespData | 5.6.4.1 | It represents a response to a modification or creation request of an Individual application AM context resource.  It is represented as a non-exclusive list of two data types AppAmContextData and AmEventsNotification. |  |
| AppAmContextUpdateData | 5.6.2.3 | It describes the modifications to an Individual application AM context resource. |  |
| PduidInformation | 5.6.2.10 | It contains the PDUID and its validity timer. |  |
| ServiceAreaCoverageInfo | 5.6.2.11 | It represents a list of Tracking Areas within a serving network. |  |

Table 5.6.1-2 specifies data types re-used by the Npcf\_AMPolicyAuthorization service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Npcf\_AMPolicyAuthorization service based interface.

Table 5.6.1-2: Npcf\_AMPolicyAuthorization re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AsTimeDistributionParam | 3GPP TS 29.507 [16] | Contains the 5G access stratum time distribution parameters. |  |
| DurationSec | 3GPP TS 29.571 [20] | Indicates a period of time in units of seconds. |  |
| DurationSecRm | 3GPP TS 29.571 [20] | It is defined as DurationSec but with the nullable property set to "true". |  |
| Gpsi | 3GPP TS 29.571 [20] | Identifies a GPSI. |  |
| NotificationMethod | 3GPP TS 29.508 [21] | It includes information about the notification methods that can be subscribed by the NF service consumer. |  |
| Pduid | 3GPP TS 29.555 [24] | String containing a PDUID |  |
| RedirectResponse | 3GPP TS 29.571 [20] | It contains redirection related information. |  |
| Supi | 3GPP TS 29.571 [20] | Identifies the SUPI. |  |
| SupportedFeatures | 3GPP TS 29.571 [20] | Used to negotiate the applicability of the optional features defined in table 5.8-1. |  |
| Tac | 3GPP TS 29.571 [20] | It contains a Tracking Area Code |  |
| PlmnIdNid | 3GPP TS 29.571 [20] | It contains the serving PLMN ID and, for a SNPN, the NID that together with the PLMN ID identifies the SNPN. |  |
| Uinteger | 3GPP TS 29.571 [20] | Unsigned integer. |  |
| Uri | 3GPP TS 29.571 [20] | String providing a URI. |  |

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

#### 5.6.2.4 Type: AmEventsSubscData

Table 5.6.2.4-1: Definition of type AmEventsSubscData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| eventNotifUri | Uri | M | 1 | Indicates the callback URI where the PCF sends the access and mobility changes events met. |  |
| events | array(AmEventData) | C | 1..N | Indicates the one or more access and mobility related events.  This attribute shall be present if available. |  |

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

### 5.7.1 General

HTTP error handling shall be supported as specified in clause 5.2.4 of 3GPP TS 29.500 [4].

For the Npcf\_AMPolicyAuthorization API, HTTP error responses shall be supported as specified in clause 4.8 of 3GPP TS 29.501 [5]. Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [4] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [4].

In addition, the requirements in the following clauses are applicable for the Npcf\_AMPolicyAuthorization API.

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