**3GPP TSG-CT WG3 Meeting #116e C3-213378**

**E-Meeting, 19th – 28th May 2021 (Revision of C3-213205)**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.522** | **CR** | **0353** | **rev** | **1** | **Current version:** | **17.1.0** |  |
|  | | | | | | | | |
| *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:*** | Resource, methods and data model for AM Policy Authorization service | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI17\_DCAMP | | | | |  | ***Date:*** | | | 2021-05-08 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | TS 23.502 clause 5.2.6.22 defines Nnef\_AMPolicyAuthorization service with service operations and parameters to provides the ability to provide inputs that can be used by the PCF for deciding access and mobility management related policies.  Hence the resource, methods and data model for AM Policy Authorization service also need to be defined in this specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adding the the resource, methods and data model for AM Policy Authorization service. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Not support stage 2 requirement on NEF support AF to provide inputs to PCF for deciding access and mobility management related policy service.. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 5.x(new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 the OpenAPI file. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

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

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.502: "Procedures for the 5G system".

[3] 3GPP TS 23.501: "System Architecture for the 5G".

[4] 3GPP TS 29.122: "T8 reference point for northbound Application Programming Interfaces (APIs)".

[5] OpenAPI: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.

[6] 3GPP TS 33.501: "Security architecture and procedures for 5G System".

[7] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

[8] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[9] 3GPP TS 29.521: "5G System; Binding Support Management Service; Stage 3".

[10] Void.

[11] 3GPP TS 23.222: "Common API Framework for 3GPP Northbound APIs; Stage 2".

[12] 3GPP TS 29.222: "Common API Framework for 3GPP Northbound APIs; Stage 3".

[13] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

[14] 3GPP TS 33.122: "Security Aspects of Common API Framework for 3GPP Northbound APIs".

[15] Void.

[16] IETF RFC 5246: "The Transport Layer Security (TLS) Protocol Version 1.2".

[17] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

[18] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[19] 3GPP TS 29.554: "5G System; Background Data Transfer Policy Control Service; Stage 3".

[20] 3GPP TS 29.504: "5G System; Unified Data Repository Services; Stage 3".

[21] 3GPP TR 21.900: "Technical Specification Group working methods".

[22] 3GPP TS 29.523: "5G System; Policy Control Event Exposure Service; Stage 3".

[23] 3GPP TS 29.519: "5G System; Usage of the Unified Data Repository service for Policy Control Data, Application Data and Structured Data for Exposure; Stage 3".

[24] 3GPP TS 29.541: "5G System; Network Exposure (NE) function services for Non-IP Data Delivery (NIDD); Stage 3".

[25] 3GPP TS 29.542: "5G System, Session management services for Non-IP Data Delivery (NIDD); Stage 3".

[26] 3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".

[27] 3GPP TS 29.520: "5G System; Network Data Analytics Services; Stage 3".

[28] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G system (5GS)".

[29] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

[30] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[31] 3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to Vehicle-to-Everything (V2X) services".

[32] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[33] 3GPP TS 24.588: "Vehicle-to-Everything (V2X) services in 5G System (5GS); User Equipment (UE) policies; Stage 3".

[34] 3GPP TS 29.572: "5G System; Location Management Services; Stage 3".

[35] 3GPP TS 29.515: "5G System; Gateway Mobile Location Services; Stage 3".

[36] 3GPP TS 23.273: "5G System Location Services (LCS)".

[37] 3GPP TS 33.535: "Authentication and Key Management for Applications (AKMA) based on 3GPP credentials in the 5G System (5GS)".

[38] 3GPP TS 29.535: "5G System; AKMA Anchor Services".

[39] 3GPP TS 33.220: "Generic Authentication Architecture (GAA); Generic Bootstrapping Architecture (GBA)".

[40] IETF RFC 7542: "The Network Access Identifier".

[m1] 3GPP TS 29.534: "5G System; Access and Mobility Policy Authorization Service; Stage 3".

[m2] IETF RFC 3986: "Uniform Resource Identifier (URI): Generic Syntax".

\*\*\* 2nd Change \*\*\*

5.x AMPolicyAuthorization API

5.x.1 Resources

5.x.1.1 Overview

All resource URIs of this API should have the following root:

**{apiRoot}/3gpp-am-policyauthorization/v1**

"apiRoot" is set as described in subclause 5.2.4 in 3GPP TS 29.122 [4]. "apiName" shall be set to "3gpp-am-policyauthorization" and "apiVersion" shall be set to "v1" for the current version defined in the present document. All resource URIs in the subclauses below are defined relative to the above root URI.

This subclause describes the structure for the Resource URIs as shown in figure 5.x.1.1-1 and the resources and HTTP methods used for the AMPolicyAuthorization API.



**Figure 5.x.1.1-1: Resource URI structure of the AMPolicyAuthorization API**

Table 5.x.1.1-1 provides an overview of the resources and HTTP methods applicable for the AMPolicyAuthorization API.

**Table 5.x.1.1-1: Resources and methods overview**

|  |  |  |  |
| --- | --- | --- | --- |
| **Resource name** | **Resource URI** | **HTTP method** | **Description** |
| Application AM Contexts | /{afId}/appAmContexts | POST | Create a new Individual application AM context resource and may create the child AM Policy Events Subscription sub-resource. |
| Individual application AM Context | /{afId}/appAmContexts/{appAmContextId} | GET | Reads an existing Individual application AM context resource. |
| PATCH | Updates an existing Individual application AM context resource. It can also create or update an AM Policy Events Subscription sub-resource. |
| DELETE | Deletes an existing Individual application AM context resource and the child AM Policy Events Subscription sub-resource. |
| AM Policy Events Subscription | /{afId}/appAmContexts/{appAmContextId}/eventsSubscription | PUT | Creates a new AM Policy Events Subscription sub-resource or modifies an existing AM Policy Events Subscription sub-resource. |
| DELETE | Deletes an AM Policy Events Subscription sub-resource. |

5.x.1.2 Resource: Application AM Contexts

5.x.1.2.1 Introduction

This resource allows a NEF to create a new Individual application AM context resource for a given AF.

5.x.1.2.2 Resource Definition

Resource URI: **{apiRoot}/3gpp-am-policyauthorization/v1/{afId}/appAmContexts**

This resource shall support the resource URI variables defined in table 5.x.1.2.2-1.

**Table 5.x.1.2.2-1: Resource URI variables for this resource**

|  |  |  |
| --- | --- | --- |
| **Name** | **Data type** | **Definition** |
| apiRoot | string | Subclause 5.2.4 of 3GPP TS 29.122 [4]. |
| afId | string | Identifier of the AF. |

5.x.1.2.3 Resource Methods

5.x.1.2.3.1 General

The following subclauses specify the resource methods supported by the resource as described in subclause 5.x.1.2.2.

5.x.1.2.3.2 POST

The POST method creates a new resource to Individual application AM context for a given AF. The AF shall initiate the HTTP POST request message and the NEF shall respond to the message. The NEF shall construct the URI of the created resource.

This method shall support the request data structures specified in table 5.x.1.2.3.2-1 and shall support the response data structures and response codes specified in table 5.x.1.2.3.2-2.

**Table 5.x.1.2.3.2-1: Data structures supported by the POST****Request Body on this resource**

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

**Table 5.x.1.2.3.2-2: Data structures supported by the****POST Response Body on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Response codes** | **Description** |
| AppAmContextExpRespData | M | 1 | 201 Created | The Individual application AM context resource was created successfully.  The URI of the created resource shall be returned in the "Location" HTTP header. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] also apply. | | | | |

Editor's note: Error responses are FFS.

**Table 5.x.1.2.3.3-3: 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}/3gpp-am-policyauthorization/v1/{afId}/ app-am-contexts/{appAmContextId} |

5.x.1.3 Resource: Individual Application AM Context

5.x.1.3.1 Introduction

This resource allows an AF to read, update or delete an existing Individual application AM context.

5.x.1.3.2 Resource Definition

Resource URI: **{apiRoot}/3gpp-am-policyauthorization/v1/{afId}/app-am-contexts/{appAmContextId}**

This resource shall support the resource URI variables defined in table 5.x.1.3.2-1.

**Table 5.x.1.3.2-1: Resource URI variables for this resource**

|  |  |  |
| --- | --- | --- |
| **Name** | **Data type** | **Definition** |
| apiRoot | string | Subclause 5.2.4 of 3GPP TS 29.122 [4]. |
| afId | string | Identifier of the AF. |
| appAmContextId | string | Identifier of the application AM context formatted according to IETF RFC 3986 [m2]. |

5.x.1.3.3 Resource Methods

5.x.1.3.3.1 General

The following subclauses specify the resource methods supported by the resource as described in subclause 5.x.1.3.2.

5.x.1.3.3.2 GET

The GET method allows to read the existing application AM context for a given AF and a given application AM context Id. The AF shall initiate the HTTP GET request message and the NEF shall respond to the message.

This method shall support the URI query parameters specified in table 5.x.1.3.3.2-1.

**Table 5.x.1.3.3.2-1: 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 5.x.1.3.3.2-2, the response data structures and response codes specified in table 5.x.1.3.3.2-3 and the Location Headers specified in table 5.x.1.3.3.2-4 and table 5.x.1.3.3.2-5.

**Table 5.x.1.3.3.2-2: Data structures supported by the GET****Request Body on this resource**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Description** |
| N/A |  |  |  |

**Table 5.x.1.3.3.2-3: Data structures supported by the****GET Response Body on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Response codes** | **Description** |
| AppAmContextExpData | M | 1 | 200 OK | Successful case.  The exposure information of an existing Individual application AM context in the request URI is returned. |
| N/A |  |  | 307 Temporary Redirect | Temporary redirection, during the AM context retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NEF.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| N/A |  |  | 308 Permanent Redirect | Permanent redirection, during the AM context retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NEF.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] also apply. | | | | |

Editor's note: Error responses are FFS.

**Table 5.x.1.3.3.2-4: Headers supported by the 307 Response Code on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Data type** | **P** | **Cardinality** | **Description** |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative NEF. |

**Table 5.x.1.3.3.2-5: Headers supported by the 308 Response Code on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Data type** | **P** | **Cardinality** | **Description** |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative NEF. |

5.x.1.3.3.3 PATCH

The PATCH method is used to modify an existing Individual application AM context. The AF shall initiate the HTTP PATCH request message and the NEF shall respond to the message.

This method shall support the URI query parameters specified in table 5.x.1.3.3.3-1.

Table 5.x.1.3.3.3-1: URI query parameters supported by the PATCH 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.x.1.3.3.3-2, the response data structures and response codes specified in table 5.x.1.3.3.3-3 and the Location Headers specified in table 5.x.1.3.3.3-4 and table 5.x.1.3.3.3-5.

**Table 5.x.1.3.3.3-2: Data structures supported by the PATCH****Request Body on this resource**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Description** |
| AppAmContextUpdateData | M | 1 | Contains the modification(s) to be applied to the Individual application AM context resource. |

**Table 5.x.1.3.3.3-3: Data structures supported by the****PATCH Response Body on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Response codes** | **Description** |
| AppAmContextExpRespData | M | 1 | 200 OK | Successful case.  The exposure information of the updated application AM context. |
| N/A |  |  | 204 No Content | The application AM context was updated successfully. |
| N/A |  |  | 307 Temporary Redirect | Temporary redirection, during the AM context modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NEF.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| N/A |  |  | 308 Permanent Redirect | Permanent redirection, during the AM context modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NEF.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] also apply. | | | | |

Editor's note: Error responses are FFS.

**Table 5.x.1.3.3.3-4: 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 NEF. |

**Table 5.x.1.3.3.3-5: 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 NEF. |

5.x.1.3.3.4 DELETE

The DELETE method deletes an existing Individual application AM context. The AF shall initiate the HTTP DELETE request message and the NEF shall respond to the message.

This method shall support the URI query parameters specified in table 5.x.1.3.3.4-1.

**Table 5.x.1.3.3.4-1: URI query parameters supported by the****DELETE method on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Data type** | **P** | **Cardinality** | **Description** |
| N/A |  |  |  |  |

This method shall support the request data structures specified in table 5.x.1.3.3.4-2 and the response data structures and response codes specified in table 5.x.1.3.3.4-3, and the Location Headers specified in table 5.x.1.3.3.4-4 and table 5.x.1.3.3.4-5.

**Table 5.x.1.3.3.4-2: Data structures supported by the DELETE****Request Body on this resource**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Description** |
| N/A |  |  |  |

**Table 5.x.1.3.3.4-3: Data structures supported by the****DELETE Response Body on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Response codes** | **Description** |
| N/A |  |  | 204 No Content | The application AM context was terminated successfully. |
| N/A |  |  | 307 Temporary Redirect | Temporary redirection, during the AM context termination. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NEF.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| N/A |  |  | 308 Permanent Redirect | Permanent redirection, during the AM context termination. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NEF.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] also apply. | | | | |

Editor's note: Error responses are FFS.

**Table 5.x.1.3.3.4-4: 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 NEF. |

**Table 5.x.1.3.3.4-5: 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 NEF. |

5.x.1.4 Resource: AM Policy Events Subscription

5.x.1.4.1 Introduction

This resource allows an AF to create a new AM policy events subscription sub-resource or modifies an existing AM policy events subscription sub-resource.

5.x.1.4.2 Resource Definition

Resource URI: **{apiRoot}/3gpp-am-policyauthorization/v1/{afId}/appAmContexts/{appAmContextId}/eventsSubscriptions**

This sub-resource shall support the resource URI variables defined in table 5.x.1.4.2-1.

**Table 5.x.1.4.2-1: Resource URI variables for this resource**

|  |  |  |
| --- | --- | --- |
| **Name** | **Data type** | **Definition** |
| apiRoot | string | Subclause 5.2.4 of 3GPP TS 29.122 [4]. |
| afId | string | Identifier of the AF. |
| appAmContextId | string | Identifier of the application AM context formatted according to IETF RFC 3986 [m2]. |

5.x.1.4.3 Resource Methods

5.x.1.4.3.1 General

The following subclauses specify the resource methods supported by the sub-resource as described in subclause 5.x.1.4.2.

5.x.1.4.3.2 PUT

The PUT method allows to create a new AM policy events subscription sub-resource in an existing application AM context or modifies an existing AM policy events subscription sub-resource. The AF shall initiate the HTTP PUT request message and the NEF shall respond to the message.

This method shall support the URI query parameters specified in table 5.x.1.4.3.2-1.

**Table 5.x.1.4.3.2-1: 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 5.x.1.4.3.2-2, the response data structures and response codes specified in table 5.x.1.4.3.2-3 and the Location Headers specified in table 5.x.1.4.3.2-4, table 5.x.1.4.3.2-5 and table 5.x.1.4.3.2-6.

**Table 5.x.1.4.3.2-2: Data structures supported by the PUT****Request Body on this resource**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Description** |
| AmEventsSubscData | M | 1 | Contains the information for the creation and/or modification of the AM Policy Events Subscription. |

**Table 5.x.1.4.3.2-3: Data structures supported by the****PUT Response Body on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Response codes** | **Description** |
| AmEventsSubscRespData | M | 1 | 201 Created | Successful case.  The AM policy events subscription sub-resource was created. The representation of the AM Policy Events Subscription sub-resource is included within the properties of the AmEventsSubscData data type. The one or more matched events, if available, are included within the properties of the AmEventsNotification data type. |
| AmEventsSubscRespData | M | 1 | 200 OK | Successful case.  The AM policy events subscription sub-resource was modified and a representation of the sub-resource is returned. The representation of the AM Policy Events Subscription sub-resource is included within the properties of the AmEventsSubscData data type. The one or more matched events, if available, are included within the properties of the AmEventsNotification data type. |
| N/A |  |  | 204 No Content | Successful case.  The AM policy events subscription sub-resource was modified successfully, with no content to be sent in the response message body. |
| N/A |  |  | 307 Temporary Redirect | Temporary redirection, during the AM policy events subscription or modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NEF.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| N/A |  |  | 308 Permanent Redirect | Permanent redirection, during the AM policy events subscription or modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NEF.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] also apply. | | | | |

Editor's note: Error responses are FFS.

Table 5.x.1.4.3.2-4: 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}/3gpp-am-policyauthorization/v1/{afId}/app-am-contexts/{appAmContextId} |

**Table 5.x.1.4.3.2-5: 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 NEF. |

**Table 5.x.1.4.3.2-6: 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 NEF. |

5.x.1.4.3.3 DELETE

The DELETE method deletes existing subscribed AM policy event(s) within the existing Individual application AM context. The AF shall initiate the HTTP DELETE request message and the NEF shall respond to the message.

This method shall support the URI query parameters specified in table 5.x.1.4.3.3-1.

**Table 5.x.1.4.3.3-1: URI query parameters supported by the****DELETE method on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Data type** | **P** | **Cardinality** | **Description** |
| N/A |  |  |  |  |

This method shall support the request data structures specified in table 5.x.1.4.3.3-2 and the response data structures and response codes specified in table 5.x.1.4.3.3-3 and the Location Headers specified in table 5.x.1.4.3.3-4 and table 5.x.1.4.3.2-5.

**Table 5.x.1.4.3.3-2: Data structures supported by the DELETE****Request Body on this resource**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Description** |
| N/A |  |  |  |

**Table 5.x.1.4.3.3-3: Data structures supported by the****DELETE Response Body on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Response codes** | **Description** |
| N/A |  |  | 204 No Content | Successful case.  The AM policy event(s) subscription resource is deleted. |
| N/A |  |  | 307 Temporary Redirect | Temporary redirection, during the AM policy events deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NEF.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| N/A |  |  | 308 Permanent Redirect | Permanent redirection, during the AM policy events deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NEF.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] also apply. | | | | |

Editor's note: Error responses are FFS.

**Table 5.x.1.4.3.3-4: 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 NEF. |

**Table 5.x.1.4.3.3-5: 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 NEF. |

5.x.2 Notifications

#### 5.x.2.1 Introduction

Upon receipt of AM Event Notification from the PCF indicating the subscribed AM policy event is detected, the NEF shall send an HTTP POST message including the notified AM policy event to the AF. The NEF and the AF shall support the notification mechanism as described in subclause 5.2.5 of 3GPP TS 29.122 [4].

Table 5.x.2.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| AM Event Notification | {eventNotifUri} | POST | The AM policy changes event notification is provided by the NEF to the AF. |
| Termination Notification | {termNotifUri} | POST | The request for termination of an Individual application AM context is provided by the NEF to the AF. |

#### 5.x.2.2 AM Event Notification

##### 5.x.2.2.1 Description

The AM Event Notification is used by the NEF to report one or several observed AM policy change events to AF that has subscribed to such Notifications via the AM policy events subscription sub-resource.

##### 5.x.2.2.2 Callback URI

The Callback URI **"{eventNotifUri}"** shall be used with the callback URI variables defined in table 5.x.2.2-1.

Table 5.x.2.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| eventNotifUri | Callback reference provided by the AF during creation of the subscription within the AM policy events subscription sub-resource as defined in Table 5.x.3.x.x-1. |

##### 5.x.2.2.3 Operation Definition

###### 5.x.2.2.3.1 Notification via HTTP POST

This method shall support the request data structures specified in table 5.x.2.2.3.1-1 and the response data structures and response codes specified in table 5.x.2.2.3.1-2 and the Location Headers specified in table 5.x.2.2.3.1-3 and table 5.x.2.2.3.1-4.

Table 5.x.2.2.3.1-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| AmEventsNotification | M | 1 | Provides information about the observed access and mobility policy change events by the NEF to the AF. |

Table 5.x.2.2.3.1-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| N/A |  |  | 204 No Content | The event notification is received successfully. |
| N/A |  |  | 307 Temporary Redirect | Temporary redirection, during event notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative AF where the notification should be sent.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| N/A |  |  | 308 Permanent Redirect | Permanent redirection, during event notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative AF where the notification should be sent.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] also apply. | | | | |

Editor's note: Error responses are FFS.

Table 5.x.2.2.3.1-3: 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 AF towards which the notification should be redirected. |

Table 5.x.2.2.3.1-4: 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 AF towards which the notification should be redirected. |

###### 5.x.2.2.3.2 Notification via Websocket

If supported by both AF and NEF and successfully negotiated, the AM Event Notification may alternatively be delivered through the Websocket mechanism as defined in subclause 5.2.5.4 of 3GPP TS 29.122 [4].

#### 5.x.2.3 Termination Request

##### 5.x.2.3.1 Description

The Termination Request is used by the NEF to notify the AF to delete the Individual Application AM context Resource.

##### 5.x.2.3.2 Callback URI

The Callback URI **"{termNotifUri}"** shall be used with the callback URI variables defined in table 5.x.2.3-1.

Table 5.x.2.3-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| termNotifUri | String formatted as URI with the Callback URI.  The Callback URI is assigned within the Individual application AM context resource and described within the AppAmContextExpData data type (see table 5.x.2.3.2-1). |

##### 5.x.2.3.3 Operation Definition

###### 5.x.2.3.3.1 Notification via HTTP POST

This method shall support the request data structures specified in table 5.x.2.3.3.1-1 and the response data structures and response codes specified in table 5.x.2.3.3.1-2 and the Location Headers specified in table 5.x.2.3.3.1-3 and table 5.x.2.3.3.1-4.

Table 5.x.2.3.3.1-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| AmTerminationInfo | M | 1 | Provides information about the cause of the termination request by the NEF to the AF. |

Table 5.x.2.3.3.1-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| N/A |  |  | 204 No Content | The termination notification is received successfully. |
| N/A |  |  | 307 Temporary Redirect | Temporary redirection, during termination notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative AF where the notification should be sent.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| N/A |  |  | 308 Permanent Redirect | Permanent redirection, during termination notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative AF where the notification should be sent.  Redirection handling is described in subclause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] also apply. | | | | |

Editor's note: Error responses are FFS.

Table 5.x.2.3.3.1-3: 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 AF towards which the notification should be redirected. |

Table 5.x.2.3.3.1-4: 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 AF towards which the notification should be redirected. |

5.x.3 Data Model

5.x.3.1 General

This subclause specifies the application data model supported by the AMPolicyAuthorization API.

5.x.2.2 Reused data types

The data types reused by the AMPolicyAuthorization API from other specifications are listed in table 5.x.2.2-1.

**Table 5.x.2.2-1: Re-used Data Types**

|  |  |  |
| --- | --- | --- |
| Data type | Reference | Comments |
| AmEventsNotification | 3GPP TS 29.534 [m1] | Describes the notification about the events occurred within an Individual application AM context resource. |
| AmEventsSubscData | 3GPP TS 29.534 [m1] | Identifies the AM policy events the application subscribes to. |
| AmEventsSubscDataRm | 3GPP TS 29.534 [m1] | This data type is defined in the same way as the "AmEventsSubscData" data type, but with the OpenAPI "nullable: true" property. |
| AmEventsSubscRespData | 3GPP TS 29.534 [m1] | 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. |
| AmTerminationInfo | 3GPP TS 29.534 [m1] | Includes information related to the termination of the Individual Application AM Context resource. |
| Gpsi | 3GPP TS 29.571 [8] | Identifies a GPSI. |
| Link | 3GPP TS 29.122 [4] | Identifies a referenced resource. |
| SupportedFeatures | 3GPP TS 29.571 [8] | Used to negotiate the applicability of the optional features defined in table 5.x.3-1. |
| WebsockNotifConfig | 3GPP TS 29.122 [4] | Contains the configuration parameters to set up notification delivery over Websocket protocol. |
| BitRate | 3GPP TS 29.571 [8] | String representing a bit rate that shall be formatted as follows:  pattern: "^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$"  Examples:  "125 Mbps", "0.125 Gbps", "125000 Kbps". |
| Ecgi | 3GPP TS 29.571 [8] | Represents an EUTRA cell identifier. |
| Ncgi | 3GPP TS 29.571 [8] | Represents an NR cell identifier. |
| Tai | 3GPP TS 29.571 [8] | Represents a tracking area identity. |
| TimeWindow | 3GPP TS 29.122 [8] | Specifies a time interval. |

5.x.2.3 Structured data types

5.x.2.3.1 Introduction

This clause defines the structured data types to be used in resource representations.

5.x.2.3.2 Type: AppAmContextExpData

**Table 5.x.2.3.2-1: Definition of type AppAmContextExpData**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| self | Link | C | 0..1 | Identifies the individual configuration resource.  Shall be present in the HTTP GET response when reading all the configurations for an AF. |  |
| evSubc | AmEventsSubscData | O | 0..1 | Represents the subscription to one or more AM policy events. |  |
| gpsi | Gpsi | M | 1 | Identifies the GPSI. |  |
| afAppId | string | O | 0..1 | Identifies the application. |  |
| reqThrputUl | BitRate | O | 0..1 | Indicates the requested uplink throughput. |  |
| reqThrputDl | BitRate | O | 0..1 | Indicates the requested downlink throughput. |  |
| policyDuration | TimeWindow | O | 0..1 | Represents a start and stop time interval of the requested policy duration. |  |
| reqResSvArea | array(ServiceAreaInfo) | O | 0..N | Indicates the requested restricted service area information. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Indicates the negotiated supported features..  It shall be supplied by the AF in the POST request that requests a creation of an Individual application AM context resource.  It shall be supplied by the NEF in the response to the POST request that requests a creation of an Individual application AM context resource. |  |
| termNotifUri | Uri | M | 1 | Identifies the callback URI where the NEF notifies the AF termination requests. |  |
| requestTestNotification | boolean | O | 0..1 | Set to true by the AF to request the NEF to send a test notification as defined in subclause 5.2.5.3 of 3GPP TS 29.122 [4]. Set to false or omitted otherwise. | Notification\_test\_event |
| websockNotifConfig | WebsockNotifConfig | O | 0..1 | Configuration parameters to set up notification delivery over Websocket protocol. | Notification\_websocket |

Editor's note: The complete list of attributes is FFS.

5.x.2.3.3 Type: AppAmContextUpdateData

**Table 5.x.2.3.3-1: Definition of type AppAmContextUpdateData**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| evSubsc | AmEventsSubscDataRm | O | 0..1 | Represents the subscription to one or more AM policy events. |  |
| reqThrputUl | BitRate | O | 0..1 | Indicates the requested uplink throughput. |  |
| reqThrputDl | BitRate | O | 0..1 | Indicates the requested downlink throughput. |  |
| policyDuration | TimeWindow | O | 0..1 | Represents a start and stop time interval of the requested policy duration. |  |
| reqResSvArea | array(ServiceAreaInfo) | O | 0..N | Indicates the requested restricted service area information. |  |
| termNotifUri | Uri | O | 0..1 | Identifies the callback URI where the NEF notifies termination requests. |  |

Editor's note: The complete list of attributes is FFS.

5.x.2.3.4 Type: ServiceAreaInfo

Table 5.x.2.3.4-1: Definition of type ServiceAreaInfo

| Attribute name | Data type | P | Cardinality | Description | Applicability |
| --- | --- | --- | --- | --- | --- |
| ecgis | array(Ecgi) | O | 1..N | This IE contains a list of E‑UTRA cell identities. |  |
| ncgis | array(Ncgi) | O | 1..N | This IE contains a list of NR cell identities. |  |
| tais | array(Tai) | O | 1..N | This IE contains a list of tracking area identities. |  |
| NOTE: The ServiceAreaInfo data type allows any combination of defined properties. | | | | | |

5.x.2.4 Simple data types and enumerations

5.x.2.4.1 Introduction

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

5.x.2.4.2 Simple data types

The simple data types defined in table 5.x.2.4.2-1 shall be supported.

**Table 5.x.2.4.2-1: Simple data types**

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

#### 5.x.2.5 Data types describing alternative data types or combinations of data types

##### 5.x.2.5.1 Type: AppAmContextExpRespData

Table 5.x.2.5.1-1: Definition of type AppAmContextExpRespData as a list of non-exclusive alternatives

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Cardinality | Description | Applicability |
| AmEventsNotification | 0..1 | It represents the notification of a match event during the creation or modification of the Individual application AM context data. |  |
| AppAmContextExpData | 1 | It represents the Individual application AM context resource. |  |

5.x.4 Used Features

The table below defines the features applicable to the AMPolicyControl API. Those features are negotiated as described in subclause 5.2.7 of 3GPP TS 29.122 [4].

**Table 5.x.3-1: Features used by AMPolicyAuthorization API**

|  |  |  |
| --- | --- | --- |
| **Feature number** | **Feature Name** | **Description** |
| 1 | Notification\_websocket | The delivery of notifications over Websocket is supported as described in 3GPP TS 29.122 [4]. This feature requires that the Notification\_test\_event feature is also supported. |
| 2 | Notification\_test\_event | The testing of notification connection is supported as described in 3GPP TS 29.122 [4]. |

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