**3GPP TSG CT WG3 Meeting #135 *C3-243227***

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

|  |
| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **29.537** | **CR** | **0034** | **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)*.* |
|  |

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

|  |
| --- |
|  |
| ***Title:***  |  Npcf\_MBSPolicyControl API |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | SBIProtoc18 |  | ***Date:*** | 2024-04-30 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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-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. In service operation clauses, some of the descriptions of NF service consumer are unclear and not aligned with other clauses.
2. The RFC number of IETF RFC 9457 is incorrect in clause 6.1.2.2.2.
3. In clause 6.1.6.2.2, the "mbsServInfo" attribute should be conditional based on the description.
4. For the OpenAPI file, the description field of some attributes by using "string" or "array" data type are missing , they should be updated to align with the guidelines of clause 5.3.9 of TS 29.501.
5. Additional editorial and format issues.
 |
|  |  |
| ***Summary of change:*** | Correct the above-detailed issues. |
|  |  |
| ***Consequences if not approved:*** | Incorrect specfication. |
|  |  |
| ***Clauses affected:*** | 5.2.2.2.2, 5.2.2.3.2, 5.2.2.4.2, 6.1.2.2.2, 6.1.3.1, 6.1.6.2.2, 6.1.6.2.4, 6.1.6.2.8, 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 introduces backwards compatible corrections to the OpenAPI description of the Npcf\_MBSPolicyControl API. |
|  |  |
| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

**Proposed changes:**

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

##### 5.2.2.2.2 MBS Policy Association Establishment



Figure 5.2.2.2.2-1: Procedure for MBS Policy Association establishment

1. In order to request the creation of an MBS Policy Association, the NF service consumer (e.g., MB-SMF) shall send an HTTP POST request to the PCF targeting the URI of the "MBS Policies" collection resource, with the request body containing the MbsPolicyCtxtData data structure that shall contain:

- the identifier of the concerned MBS Session, within the "mbsSessionId" attribute;

- the MBS Service Information, if available, within the "mbsServInfo" attribute;

- the list of supported features, if feature negotiation needs to take place, within the "suppFeat" attribute; and

- the Area Session Policy ID within the "areaSessPolId" attribute, if the "AreaSessPolicy" feature is supported and the request corresponds to an MBS Session that is an instance of a location-dependent MBS service.

and may contain:

- the DNN of the MBS session, within the "dnn" attribute; and

- the S-NSSAI of the MBS session, within the "snssai" attribute.

2. Upon reception of the HTTP POST request from the NF service consumer:

- if MBS Service Information is present within the "mbsServInfo" attribute, the MBS session is an instance of a location-dependent MBS service, and if the "AreaSessPolicy" feature is supported, the Area Session Policy ID is present within the "areaSessPolId" attribute, and the PCF is not already serving this location-dependent MBS service (i.e., there is no MBS Policy Association at the PCF for the MBS Session ID provided within "mbsSessionId" attribute), or if the MBS Service Information is not present, the PCF may interact with the BSF by invoking the Nbsf\_Management\_Register service operation, as specified in clause 4.2.2.4 of 3GPP TS 29.521 [21], to check whether there is already a PCF serving the MBS Session, and if it is not the case, register itself as the PCF serving the MBS session;

NOTE 1: Interacting with the BSF is not necessary in a deployment with a single PCF.

- if MBS Service Information is present within the "mbsServInfo" attribute, then:

- the PCF may interact with the UDR to retrieve MBS Session policy control data for the MBS session, as specified in 3GPP TS 29.519 [20];

NOTE 2: Interacting with the UDR for MBS Session policy control data retrieval is not necessary in a deployment where MBS Policy Session policy control data is stored locally at the PCF.

- the PCF shall then perform MBS policy authorization based on the received MBS Service Information, the operator policies that are pre-configured at the PCF and the MBS Session policy control data retrieved from the UDR, if any;

- if MBS policy authorization is successful, the PCF shall derive the required MBS policies (e.g., QoS parameters) and determine whether they are allowed or not;

- if the required MBS policies are allowed:

- the PCF shall store the generated MBS policies for the MBS session together with the corresponding MBS session ID, and if the "AreaSessPolicy" feature is supported and the MBS session is an instance of a location-dependent MBS service, the corresponding Area Session Policy ID; and

- if MBS policy authorization is not successful or the required MBS policies are not allowed, the PCF shall reject the request with an appropriate error response as specified below in this clause;

- otherwise, when MBS Service Information is not present within the "mbsServInfo" attribute and the PCF has previously derived the necessary MBS policies for the MBS session using the procedure defined in clause 5.3.2.2, the PCF shall provide these MBS policies in the response message returned to the NF service consumer (e.g., MB-SMF) as described below;

- upon success, the PCF shall:

- create a new "Individual MBS Policy" resource; and

- respond to the NF service consumer with an HTTP "201 Created" status code including a Location header field containing the URI of the created "Individual MBS Policy" resource, and the response body including the MbsPolicyData data structure that shall contain:

- the received input parameters within the corresponding request body, within the "mbsPolicyCtxtData" attribute;

- the provisioned MBS Policy Decision containing the MBS policies derived by the PCF as defined above in this clause, within the "mbsPolicies" attribute; and

- the list of supported features, if feature negotiation is taking place, within the "suppFeat" attribute;

- if errors occur when processing the HTTP POST request, the PCF shall apply the error handling procedures specified in clause 6.1.7;

NOTE 3: The PCF also deregisters at the BSF from being the PCF serving the MBS Session using the procedure defined in clause 4.2.3.4 of 3GPP TS 29.521 [21], if the PCF created such MBS Session binding as defined above in this clause. Interacting with the BSF to deregister from being the PCF serving the MBS Session is not necessary in a deployment with a single PCF.

NOTE 4: For a location-dependent MBS service, the PCF deregisters at the BSF from being the PCF serving the MBS Session as indicated in NOTE 3 above only if it is the last MBS Policy Association associated to the location-dependent MBS service (i.e., associated to the corresponding MBS Session ID).

- if MBS Service Information is provided but is invalid, incorrect or insufficient for the PCF to perform MBS policy authorization, the PCF shall reject the request with an HTTP "400 Bad Request" response message including the ProblemDetails data structure with the "cause" attribute set to "INVALID\_MBS\_SERVICE\_INFO";

- if MBS Service Information is provided, but the MBS IP flow(s) description provided within the MBS Service Information cannot be handled by the PCF because the restrictions defined in clause 5.3.8 of 3GPP TS 29.214 [19] are not respected, the PCF shall reject the request with an HTTP "400 Bad Request" status code including the ProblemDetails data structure with the "cause" attribute set to "FILTER\_RESTRICTIONS\_NOT\_RESPECTED";

- if from an application level point of view, the provided set of input parameters is incomplete, erroneous or missing necessary information for the PCF to perform MBS policy control, the PCF shall reject the request with an HTTP "400 Bad Request" response message including the ProblemDetails data structure with the "cause" attribute set to "ERROR\_INPUT\_PARAMETERS";

- if MBS Service Information is provided but is not authorized, the PCF shall reject the request with an HTTP "403 Forbidden" status code including the MbsExtProblemDetails data structure that shall contain:

- the ProblemDetails data structure with the "cause" attribute set to "MBS\_SERVICE\_INFO\_NOT\_AUTHORIZED";

and may contain:

- the AcceptableMbsServInfo data structure including the MBS Service Information that is acceptable for the PCF;

and

- if the PCF denies the creation of the "Individual MBS Policy" resource based on local configuration and/or operator policies, the PCF shall reject the request within an HTTP "403 Forbidden" status code including the "cause" attribute of the ProblemDetails data structure set to "MBS\_POLICY\_CONTEXT\_DENIED". At the reception of this error code and based on the internally configured failure actions, the NF service consumer may reject or allow, by applying local policies, the establishment of the corresponding MBS session.

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

##### 5.2.2.3.2 MBS Policy Association Update



Figure 5.2.2.3.2-1: Procedure for MBS Policy Association Update

1. In order to request the update of an existing MBS Policy Association, the NF service consumer shall invoke the "Update" resource custom operation by sending an HTTP POST request to the PCF targeting the URI of the corresponding "Individual MBS Policy" resource custom operation, i.e. "{apiRoot}/npcf-mbspolicycontrol/<apiVersion>/mbs-policies/{mbsPolicyId}/update", with the request body including the MbsPolicyCtxtDataUpdate data structure that may contain:

- the updated MBS Service Information, within the "mbsServInfo" attribute;

- the MBS Policy Control Request Triggers that are met, within the "mbsPcrts" attribute, and/or

- the MBS Error reporting containing the MBS Policy Decision installation and/or enforcement failure(s), within the "mbsErrorReport" attribute.

 If the PCF determines that the received HTTP POST request needs to be redirected, the PCF shall respond with an HTTP redirect response, as specified in clause 6.10.9 of 3GPP TS 29.500 [4].

2. Upon reception of the HTTP POST request from the NF service consumer:

- if the MBS Policy Control Request Trigger "MBS\_SESSION\_UPDATE" is triggered and updated MBS Service Information is present within the "mbsServInfo" attribute, then the PCF shall perform MBS policy authorization for the received updated MBS Service Information taking into account the operator policies pre-configured at the PCF and/or the MBS Session policy control data retrieved from the UDR. Then:

- if MBS policy authorization is successful, the PCF shall determine whether updated MBS policies (e.g., QoS parameters) need to be derived and provisioned. If it is the case, the PCF shall derive these required updated MBS policies (e.g., QoS parameters) and determine whether they are allowed or not;

- if updated MBS policies are derived and allowed, the PCF shall store the generated updated MBS policies for the MBS session together with the corresponding MBS session ID; and

- if MBS policy authorization is not successful or the required updated MBS policies, if any, are not allowed, the PCF shall reject the request with an appropriate error response as specified below in this clause;

- if the MBS Policy Control Request Trigger "MBS\_SESSION\_UPDATE" is triggered and no updated MBS Service Information is provided, then the PCF may identify whether there are any updated MBS policies that need to be applied as per the procedure defined in clause 5.3.2.3 and/or based on local configuration;

NOTE: If updated MBS Service Information is not present in the received request, then the PCF has previously determined and generated the required updated MBS policies for the MBS session as specified in clause 5.3.

- if MBS error reporting is present in the request and contains a set of MBS Policy Decision installation and/or enforcement failure(s), the PCF may take it into account when deriving the required updated MBS policies as specified in clause 5.2.4.1;

- upon success, the PCF shall:

- update the corresponding "Individual MBS Policy" resource accordingly; and

- respond to the NF service consumer with an HTTP "200 OK" status code with the response body including the MbsPolicyData data structure that shall contain:

- the updated complete list of input parameters, within the "mbsPolicyCtxtData" attribute;

and may contain:

- the updated MBS Policy Decision containing the updated, deleted and/or newly provisioned MBS policies, within the "mbsPolicies" attribute;

- if errors occur when processing the HTTP POST request, the PCF shall apply the error handling procedures specified in clause 6.1.7;

- if updated MBS Service Information is provided but is invalid, incorrect or insufficient for the PCF to perform MBS policy authorization, the PCF shall reject the request with an HTTP "400 Bad Request" response message including the ProblemDetails data structure with the "cause" attribute set to "INVALID\_MBS\_SERVICE\_INFO";

- if updated MBS Service Information is provided, but the MBS IP flow(s) description provided within the MBS Service Information cannot be handled by the PCF because the restrictions defined in clause 5.3.8 of 3GPP TS 29.214 [19] are not respected, the PCF shall reject the request with an HTTP "400 Bad Request" status code including the ProblemDetails data structure with the "cause" attribute set to "FILTER\_RESTRICTIONS\_NOT\_RESPECTED";

- if from an application level point of view, the provided set of input parameters is incomplete, erroneous or missing necessary information for the PCF to perform MBS policy control, the PCF shall reject the request with an HTTP "400 Bad Request" response message including the ProblemDetails data structure with the "cause" attribute set to "ERROR\_INPUT\_PARAMETERS";

- if updated MBS Service Information is provided but is not authorized, the PCF shall reject the request with an HTTP "403 Forbidden" status code including the MbsExtProblemDetails data structure that shall contain:

- the ProblemDetails data structure with the "cause" attribute set to "MBS\_SERVICE\_INFO\_NOT\_AUTHORIZED";

and may contain:

- the AcceptableMbsServInfo data structure including the MBS Service Information that is acceptable for the PCF;

- if the PCF denies the update of the "Individual MBS Policy" resource based on local configuration and/or operator policies, the PCF shall reject the request within an HTTP "403 Forbidden" status code including the ProblemDetails data structure with the "cause" attribute set to "MBS\_POLICY\_CONTEXT\_DENIED". At the reception of this error code and based on the internally configured failure actions, the NF service consumer (e.g., MB-SMF) may reject or allow, by applying local policies, the update of the corresponding MBS session; and

- if the targeted "Individual MBS Policy" resource does not exist, the PCF shall reject the request with an HTTP "404 Not Found" status code including the ProblemDetails data structure with the "cause" attribute set to "MBS\_POLICY\_ASSOCIATION\_NOT\_FOUND".

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

##### 5.2.2.4.2 MBS Policy Association Deletion



Figure 5.2.2.4.2-1: MBS Policy Association Deletion procedure

1. In order to request the deletion of an existing MBS Policy Association, the NF service consumer shall send an HTTP DELETE request to the PCF, targeting the URI of the corresponding "Individual MBS Policy" resource.

 If the PCF determines that the received HTTP DELETE request needs to be redirected, the PCF shall respond with an HTTP redirect response, as specified in clause 6.10.9 of 3GPP TS 29.500 [4].

2. On successful deletion of the targeted MBS Policy Association:

- the PCF may deregister at the BSF from being the PCF serving the MBS Session using the procedure defined in clause 4.2.3.4 of 3GPP TS 29.521 [21], if the PCF created such MBS Session binding during the creation of the MBS Policy Association, and for a location-dependent MBS service, this is the last MBS Policy Association associated to the location-dependent MBS service (i.e., associated to the corresponding MBS Session ID), as specified in clause 5.2.2.2; and

- the PCF shall respond to the NF service consumer (e.g., MB-SMF) with an HTTP "204 No Content" status code.

If errors occur when processing the HTTP DELETE request, the PCF shall apply the error handling procedures specified in clause 6.1.7.

If the targeted "Individual MBS Policy" resource does not exist, the PCF shall reject the request with an HTTP "404 Not Found" status code including the ProblemDetails data structure with the "cause" attribute set to "MBS\_POLICY\_ASSOCIATION\_NOT\_FOUND".

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

##### 6.1.2.2.2 Content type

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".

The "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 9457 [13].

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

#### 6.1.3.1 Overview

This clause describes the structure for the resource URIs and the resources and methods used for the Npcf\_MBSPolicyControl service.

Figure 6.1.3.1-1 depicts the resource URIs structure for the Npcf\_MBSPolicyControl API.



Figure 6.1.3.1-1: Resource URI structure of the Npcf\_MBSPolicyControl API

Table 6.1.3.1-1 provides an overview of the resources and applicable HTTP methods defined for the Npcf\_MBSPolicyControl API.

Table 6.1.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource purpose/name | Resource URI (relative path after API URI) | HTTP method or custom operation | Description (service operation) |
| MBS Policies | /mbs-policies | POST | Request the creation of a new Individual MBS Policy resource. |
| Individual MBS Policy | /mbs-policies/{mbsPolicyId} | GET | Request the retrieval of an existing Individual MBS Policy resource. |
| DELETE | Request the deletion of an existing Individual MBS Policy resource. |
| Update(POST) | Request the update of an existing Individual MBS Policy resource. |

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

##### 6.1.6.2.2 Type: MbsPolicyCtxtData

Table 6.1.6.2.2-1: Definition of type MbsPolicyCtxtData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| mbsSessionId | MbsSessionId | M | 1 | Represents the identifier of the MBS Session. |  |
| dnn | Dnn | O | 0..1 | Represents the DNN of the MBS session. |  |
| snssai | Snssai | O | 0..1 | Represents the S-NSSAI of the MBS session. |  |
| areaSessPolId | AreaSessionPolicyId | C | 0..1 | Represents the Area Session Policy ID.This attribute shall be present if available. | AreaSessPolicy |
| mbsServInfo | MbsServiceInfo | C | 0..1 | Represents the MBS Service Information.This attribute shall be provided, if available. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of the supported features as defined in clause 6.1.8.This attribute shall be present when feature negotiation needs to take place. |  |

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

##### 6.1.6.2.4 Type: MbsPolicyData

Table 6.1.6.2.4-1: Definition of type MbsPolicyData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| mbsPolicyCtxtData | MbsPolicyCtxtData | M | 1 | Contains the parameters used to request MBS Policy Association creation/update. |  |
| mbsPolicies | MbsPolicyDecision | C | 0..1 | Contains the provisioned MBS Policy Decision containing the MBS policies authorized by the PCF.This attribute shall be present in the response to a request to create an MBS Policy Association or a request to retrieve the properties of an existing MBS Policy Association, and may be present in the response to a request to update an existing MBS Policy Association. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of negotiated supported features as defined in clause 6.1.8.This parameter shall be provided by the PCF in the response to a request in which the NF service consumer provided the list of features that it supports. |  |

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

##### 6.1.6.2.8 Type: MbsQosDec

Table 6.1.6.2.8-1: Definition of type MbsQosDec

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| mbsQosId | string | M | 1 | Univocally identifies the MBS QoS Decision within the related MBS session. |  |
| 5qi | 5Qi | O | 0..1 | Contains the identifier of the authorized QoS parameters for the MBS service data flow.(NOTE 2) |  |
| priorityLevel | 5QiPriorityLevel | O | 0..1 | Indicates a priority in scheduling resources among MBS QoS flows.(NOTE 1) |  |
| mbrDl | BitRate | O | 0..1 | Indicates the maximum bandwidth in downlink. |  |
| gbrDl | BitRate | O | 0..1 | Indicates the guaranteed bandwidth in downlink. |  |
| arp | Arp | O | 0..1 | Indicates the allocation and retention priority. |  |
| averWindow | AverWindow | O | 0..1 | Represents the duration over which the guaranteed and maximum bitrates shall be calculated.(NOTE 1) |  |
| mbsMaxDataBurstVol | MbsMaxDataBurstVol | O | 0..1 | Denotes the largest amount of data that is required to be transferred within a period.(NOTE 1) |  |
| NOTE 1: This attribute is applicable only when a value different from the standardized 5QI values, defined in table 5.7.4-1 3GPP TS 23.501 [2], is provided.NOTE 2: When the provided 5QI value is a dynamically assigned 5QI (i.e. from the non-standardized and non-preconfigured value range), the corresponding QoS parameters (e.g., Packet Delay Budget, Packet Error Rate, etc.) are provided in the corresponding MbsQosChar data structure. |

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

# A.2 Npcf\_MBSPolicyControl API

openapi: 3.0.0

info:

 title: Npcf\_MBSPolicyControl API

 version: 1.1.0-alpha.3

 description: |

 MBS Policy Control Service

 © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

 All rights reserved.

externalDocs:

 description: >

 3GPP TS 29.537 V18.3.0; 5G System; Multicast/Broadcast Policy Control Services.

 url: 'https://www.3gpp.org/ftp/Specs/archive/29\_series/29.537/'

security:

 - {}

 - oAuth2ClientCredentials:

 - npcf-mbspolicycontrol

servers:

 - url: '{apiRoot}/npcf-mbspolicycontrol/v1'

 variables:

 apiRoot:

 default: https://example.com

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

paths:

 /mbs-policies:

 post:

 summary: Request the creation of a new MBS Policy Association.

 operationId: CreateMBSPolicy

 tags:

 - MBS Policies (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: >

 Created. An Individual MBS Policy resource is successfully created.

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: >

 Contains the URI of the newly created Individual MBS Policy resource.

 required: true

 schema:

 type: string

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

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

 '403':

 description: Forbidden.

 content:

 application/problem+json:

 schema:

 $ref: 'TS29537\_Npcf\_MBSPolicyAuthorization.yaml#/components/schemas/MbsExtProblemDetails'

 '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'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

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

 default:

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

 /mbs-policies/{mbsPolicyId}:

 parameters:

 - name: mbsPolicyId

 in: path

 description: >

 Contains the identifier of the concerned Individual MBS Policy resource.

 required: true

 schema:

 type: string

 get:

 summary: Read an Individual MBS Policy resource.

 operationId: GetIndMBSPolicy

 tags:

 - Individual MBS Policy (Document)

 responses:

 '200':

 description: >

 OK. The requested Individual MBS Policy resource is successfully returned.

 content:

 application/json:

 schema:

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

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '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'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

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

 default:

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

 delete:

 summary: Deletes an existing Individual MBS Policy resource.

 operationId: DeleteIndMBSPolicy

 tags:

 - Individual MBS Policy (Document)

 parameters:

 - name: mbsPolicyId

 in: path

 description: >

 Contains the identifier of the concerned Individual MBS Policy resource.

 required: true

 schema:

 type: string

 responses:

 '204':

 description: >

 No Content. The concerned Individual MBS Policy resource is successfully deleted.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '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'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

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

 default:

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

 /mbs-policies/{mbsPolicyId}/update:

 post:

 summary: Request the update of an existing MBS Policy Association.

 operationId: UpdateIndMBSPolicy

 tags:

 - Individual MBS Policy (Document)

 parameters:

 - name: mbsPolicyId

 in: path

 description: >

 Contains the identifier of the concerned Individual MBS Policy resource.

 required: true

 schema:

 type: string

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '200':

 description: >

 OK. The targeted Individual MBS Policy resource is successfully updated.

 content:

 application/json:

 schema:

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

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

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

 '403':

 description: Forbidden.

 content:

 application/problem+json:

 schema:

 $ref: 'TS29537\_Npcf\_MBSPolicyAuthorization.yaml#/components/schemas/MbsExtProblemDetails'

 '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'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '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:

 npcf-mbspolicycontrol: Access to the Npcf\_MBSPolicyControl API

 schemas:

 MbsPolicyCtxtData:

 description: >

 Contains the parameters used to request the creation of an MBS Policy

 Association.

 type: object

 properties:

 mbsSessionId:

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

 dnn:

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

 snssai:

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

 areaSessPolId:

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

 mbsServInfo:

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

 suppFeat:

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

 required:

 - mbsSessionId

 MbsPolicyDecision:

 description: >

 Represents the parameters constituting an MBS Policy Decision.

 type: object

 properties:

 mbsPccRules:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: >

 A map of MBS PCC rule(s) with each map entry containing the MbsPccRule data structure.

 The key of the map for each entry is the mbsPccRuleId attribute of the corresponding

 MbsPccRule data structure.

 nullable: true

 mbsQosDecs:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: >

 A map of MBS QoS Decision(s) with each map entry containing the MbsQosDec data structure.

 The key of the map for each entry is the mbsQosId attribute of the corresponding

 MbsQosDec data structure.

 mbsQosChars:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: >

 A map of MBS QoS Characteristics set(s) with each map entry containing the MbsQosChar data

 structure. The key of the map for each entry is the 5QI attribute of the corresponding

 MbsQosDec data structure.

 authMbsSessAmbr:

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

 mbsPcrts:

 type: array

 items:

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

 minItems: 1

 nullable: true

 description: >

 The MBS Policy Control Request Triggers(s) that the PCF requests to subscribe to.

 MbsPolicyData:

 description: >

 Contains the MBS policy data provisioned as part of an MBS Policy Association.

 type: object

 properties:

 mbsPolicyCtxtData:

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

 mbsPolicies:

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

 suppFeat:

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

 required:

 - mbsPolicyCtxtData

 MbsPccRule:

 description: Represents the parameters constituting an MBS PCC rule.

 type: object

 properties:

 mbsPccRuleId:

 type: string

 description: >

 Univocally identifies the MBS PCC rule within the related MBS session.

 mbsDlIpFlowInfo:

 type: array

 items:

 $ref: 'TS29512\_Npcf\_SMPolicyControl.yaml#/components/schemas/FlowDescription'

 minItems: 1

 description: >

 Contains the MBS downlink IP flow packet filter(s) information.

 precedence:

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

 refMbsQosDec:

 type: array

 items:

 type: string

 minItems: 1

 maxItems: 1

 description: >

 A reference to the MbsQosDec policy decision type.

 required:

 - mbsPccRuleId

 MbsQosDec:

 description: Represents the parameters constituting an MBS QoS Decision.

 type: object

 properties:

 mbsQosId:

 type: string

 description: >

 Univocally identifies the MBS QoS Decision within the related MBS session.

 5qi:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/5Qi'

 priorityLevel:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/5QiPriorityLevel'

 mbrDl:

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

 gbrDl:

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

 arp:

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

 averWindow:

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

 mbsMaxDataBurstVol:

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

 required:

 - mbsQosId

 MbsQosChar:

 description: >

 Represents the parameters constituting a set of explicitly signalled QoS characteristics.

 type: object

 properties:

 5qi:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/5Qi'

 priorityLevel:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/5QiPriorityLevel'

 resourceType:

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

 packetDelayBudget:

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

 packetErrorRate:

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

 averWindow:

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

 mbsMaxDataBurstVol:

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

 required:

 - 5qi

 - resourceType

 - priorityLevel

 - packetDelayBudget

 - packetErrorRate

 - mbsMaxDataBurstVol

 MbsPolicyCtxtDataUpdate:

 description: >

 Contains the parameters to request the modification of an existing MBS Policy Association.

 type: object

 properties:

 mbsServInfo:

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

 mbsPcrts:

 type: array

 items:

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

 minItems: 1

 description: >

 Represents the list of MBS Policy Control Request Triggers that are met.

 mbsErrorReport:

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

 MbsErrorReport:

 description: >

 Represents the reporting of MBS Policy decision level failure(s) and/or MBS PCC rule level

 failure(s).

 type: object

 properties:

 mbsReports:

 type: array

 items:

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

 minItems: 1

 MbsReport:

 description: >

 Contains information about the MBS Policy Decision level failure(s) and/or the MBS PCC

 rule level failure(s).

 type: object

 properties:

 mbsPccRuleIds:

 type: array

 items:

 type: string

 minItems: 1

 description: >

 Contains the identifier(s) of the affected MBS PCC rule(s).

 mbsPccRuleStatus:

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

 failureCode:

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

# Simple data types:

 MbsMaxDataBurstVol:

 description: Represents the MBS Maximum Data Burst Volume expressed in Bytes.

 type: integer

 minimum: 1

 maximum: 2000000

# ENUMS:

 MbsPcrt:

 anyOf:

 - type: string

 enum:

 - MBS\_SESSION\_UPDATE

 - type: string

 description: >

 This string provides forward-compatibility with future extensions to the enumeration

 and is not used to encode content defined in the present version of this API.

 description: |

 Represents the MBS Policy Control Request Trigger.

 Possible values are:

 - MBS\_SESSION\_UPDATE: Indicates the MBS Session Update policy control request trigger.

 MbsPccRuleStatus:

 anyOf:

 - type: string

 enum:

 - ACTIVE

 - INACTIVE

 - type: string

 description: >

 This string provides forward-compatibility with future extensions to the enumeration

 and is not used to encode content defined in the present version of this API.

 description: |

 Represents the MBS PCC rule status.

 Possible values are:

 - ACTIVE: Indicates that the MBS PCC rule(s) are successfully installed.

 - INACTIVE: Indicates that the MBS PCC rule(s) are removed.

 MbsFailureCode:

 anyOf:

 - type: string

 enum:

 - NF\_MALFUNCTION

 - NF\_RESOURCES\_UNAVAILABLE

 - RESOURCE\_ALLOCATION\_FAILURE

 - MBS\_QOS\_VALIDATION\_FAILURE

 - NO\_MBS\_QOS\_FLOW

 - MBS\_QOS\_DECISION\_ERROR

 - MBS\_POLICY\_PARAM\_ERROR

 - type: string

 description: >

 This string provides forward-compatibility with future extensions to the enumeration

 and is not used to encode content defined in the present version of this API.

 description: |

 Represents the reason for the MBS Policy Decision(s) enforcement failure or

 the MBS PCC rule(s) installation failure.

 Possible values are:

 - NF\_MALFUNCTION: Indicates that the MBS PCC rule could not be successfully installed due

 to MB-SMF/MB-UPF malfunction.

 - NF\_RESOURCES\_UNAVAILABLE: Indicates that the MBS PCC rule could not be successfully

 installed due to resources unavailable at the MB-SMF/MB-UPF.

 - RESOURCE\_ALLOCATION\_FAILURE: Indicates that the MBS PCC rule could not be successfully

 installed or maintained since the associated MBS QoS flow establishment/modification

 failed or the associated MBS QoS flow was released.

 - MBS\_QOS\_VALIDATION\_FAILURE: Indicates that MBS QoS validation has failed.

 - NO\_MBS\_QOS\_FLOW: Indicates that there is no MBS QoS flow to which the MB-SMF can bind

 the MBS PCC rule(s).

 - MBS\_QOS\_DECISION\_ERROR: Indicates failure in the provisioning of MBS QoS Decision data.

 - MBS\_POLICY\_PARAM\_ERROR: Indicates that the information related to the provisioned MBS

 policy parameter(s) is incorrect, incomplete or inconsistent.

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