**3GPP TSG- Meeting #C3-243579**

**Hyderabad, IN, 27 - 31 May, 2024 was C3-243264**

|  |
| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** | **1294** | **rev** | **1** | **Current version:** |  |  |
|  |
| *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:***  | Additional corrections and updates to the definition of the PdtqPolicyNegotiation API |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | AIMLsys |  | ***Date:*** | 2024-05-20 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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 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 definition of the PdtqPolicyNegotiation API needs further corrections and alignments with the drafting rules and NBI TS skeleton (in addition to the agreed corrections in C3-242577).In addition, the HTTP PUT method on the individual resource is not defined for this API. As already agreed in Rel-17, it is recommended to always suppot both PUT and PATCH for resource update, unless one of them is deemed technically not appropriate with regards to the use case or functionality, which is not the case here. |
|  |  |
| ***Summary of change:*** | This CR proposes to:* Correct the above-detailed issues.
* Add the support for the HTTP PUT method on the individual resource.
 |
|  |  |
| ***Consequences if not approved:*** | * The provisions related to the definition of the PdtqPolicyNegotiation API continue to contain errors and misalignments with the drafting rules and NBI TS skeleton.
 |
|  |  |
| ***Clauses affected:*** | 4.4.35, 5.31.1.1, 5.31.1.2, 5.31.1.2.1, 5.31.1.2.2, 5.31.1.2.3, 5.31.1.2.3.1, 5.31.1.2.3.2, 5.31.1.2.3.3, 5.31.1.2.4 (new clause), 5.31.1.3.1, 5.31.1.3.2, 5.31.1.3.3, 5.31.1.3.3.1, 5.31.1.3.3.2, 5.31.1.3.3.3, 5.31.1.3.3.4, 5.31.1.3.4 (new clause), 5.31.2.1, 5.31.2.2.1, 5.31.2.2.2, 5.31.2.2.3.1, 5.31.3.1, 5.31.3.2, 5.31.3.3.2, 5.31.3.3.3, 5.31.3.3.4, A.29 |
|  |  |
|  | **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 PdtqPolicyNegotiation API defined in this specification. |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* \* Start of changes \* \* \* \*

### 4.4.35 Procedures for negotiation of planned data transfer with QoS requirements

These procedures are used by an AF to perform negotiation of a viable time window for the planned application data transfer via the support of the NEF.

In order to create a resource for the PDTQ policy, the AF shall send an HTTP POST message to the NEF for the "PDTQ Policy Subscriptions" resource to negotiate the PDTQ policy. The body of the HTTP POST message shall include the ASP Identifier, Number of UEs, the list of Desired Time Windows, QoS reference or individual QoS parameters and optionally network area information, application identifier and Alternative Service Requirements. The AF may also include a notification URI and a request to enable the PDTQ warning notification during the planned data transfer policy negotiation.

After receiving the HTTP POST message, if the AF is authorized, the NEF may map the information received from the AF (e.g. QoS reference and network area information) based on local policies and negotiate the PDTQ policy with the PCF as described in 3GPP TS 29.543 [68]. After receiving the response including the determined PDTQ policies from the PCF, the NEF shall create an "Individual PDTQ Policy Subscription" resource which represents the PDTQ Subscription, addressed by an URI that contains the AF identifier and a NEF-created "Individual PDTQ Policy Subscription" resource identifier, and shall respond to the AF with a 201 Created message, including a Location header field containing the URI for the created resource and a message body, which shall also include a PDTQ Reference ID and a set of PDTQ policies. The AF shall use the URI received in the Location header in subsequent requests to the NEF to refer to this PDTQ Policy Subscription. If the NEF receives a response with an error code from the PCF, the NEF shall not create the resource and shall respond to the AF with a corresponding failure code as described in clause 5.31.5.

If more than one policy is included in the HTTP response, the AF shall send an HTTP PATCH message to inform the NEF for the "Individual PDTQ Policy Subscription" resource of the PDTQ policy selected by the AF. The AF may also send an HTTP PATCH to request to disable/enable the PDTQ warning notification at any moment.

After receiving the HTTP PATCH message, the NEF shall send an HTTP response to the AF with a "200 OK" status code and shall include the Pdtq data type in the response body, or with a "204 No Content" status code, then the NEF shall interact with the PCF as defined in 3GPP TS 29.543 [68]. If the NEF identifies any error (e.g. selected policy is not within the set of PDTQ policies), the NEF shall not update the resource and shall respond to the AF with a corresponding failure code as described in clause 5.31.5.

When the NEF receives the PDTQ warning notification from the PCF as defined in clause 5.2.2.4.2 of 3GPP TS 29.543 [68] and the "warnNotifEnabled" attribute was set to true, the NEF shall send an HTTP POST message including the Notification data structure to the AF identified by the notification destination URI received during the planned data transfer policy negotiation. The AF shall respond with an HTTP response to confirm the received notification and even if only one candidate PDTQ policy was provided within the PDTQ warning notification, the AF shall send the HTTP PATCH message with the "selectedPolicy" attribute to the NEF. The "selectedPolicy" attribute shall contain the identifier of the selected candidate PDTQ policy or, otherwise value "0" indicating no PDTQ policy is accepted by the AF. The AF may also request to disable/enable the PDTQ warning notification by including the "warnNotifEnabled" attribute in the HTTP PATCH message.

The AF may also send an HTTP DELETE message to the NEF for the "Individual PDTQ Policy Subscription" resource requesting to remove an individual resource identified by the URI received in the response to the request that has created resource a URI. After receiving such request, the NEF shall delete the resource and send an HTTP response to the AF with a corresponding status code.

NOTE: The NEF can also remove the resource when the last window end time in PDTQ policies expires.

\* \* \* \* Next changes \* \* \* \*

#### 5.31.1.1 Overview

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

**{apiRoot}/3gpp-pdtq-policy-negotiation/v1**

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

This clause describes the structure for the Resource URIs as shown in figure 5.31.1.1-1 and the resources and HTTP methods used for the PdtqPolicyNegotiation API.



Figure 5.31.1.1-1: Resource URI structure of the PdtqPolicyNegotiation API

Table 5.31.1.1-1 provides an overview of the resources and HTTP methods applicable for the PdtqPolicyNegotiation API.

Table 5.31.1.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| PDTQ Policy Subscriptions | /{afId}/subscriptions | GET | Read all the active PDTQ Policy Subscription resources for a given AF. |
| POST | Create a new PDTQ Policy Subscription. |
| Individual PDTQ Policy Subscription | /{afId}/subscriptions/{subscriptionId} | GET | Retrieve an existing "Individual PDTQ Policy Subscription" resource. |
| PATCH | Modify an existing "Individual PDTQ Policy Subscription" resource. |
| DELETE | Delete an existing "Individual PDTQ Policy Subscription" resource. |

\* \* \* \* Next changes \* \* \* \*

#### 5.31.1.2 Resource: PDTQ Policy Subscriptions

\* \* \* \* Next changes \* \* \* \*

##### 5.31.1.2.1 Introduction

This resource represents all the active PDTQ Policy Subscriptions managed by the NEF for a given AF.

This resource is modelled with the Collection resource archetype (see clause C.2 of 3GPP TS 29.501 [3]).

\* \* \* \* Next changes \* \* \* \*

##### 5.31.1.2.2 Resource Definition

Resource URI: **{apiRoot}/3gpp-pdtq-policy-negotiation/<apiVersion>/{afId}/subscriptions**

This resource shall support the resource URI variables defined in table 5.31.1.2.2-1.

Table 5.31.1.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.31.0. |
| afId | string | Represents the identifier of the AF. |

\* \* \* \* Next changes \* \* \* \*

##### 5.31.1.2.3 Resource Standard Methods

\* \* \* \* Next changes \* \* \* \*

###### 5.31.1.2.3.1 Void

\* \* \* \* Next changes \* \* \* \*

###### 5.31.1.2.3.2 GET

The HTTP GET method allows to retrieve all the active PDTQ Policy Subscriptions managed by the NEF.

This method shall support the URI query parameters specified in table 5.31.1.2.3.2-1.

Table 5.31.1.2.3.2-1: URI query parameters supported by the GETmethod on this resource

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

This method shall support the request data structures specified in table 5.31.1.2.3.2-2 and the response data structures and response codes specified in table 5.31.1.2.3.2-3.

Table 5.31.1.2.3.2-2: Data structures supported by the GETRequest Body on this resource

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

Table 5.31.1.2.3.2-3: Data structures supported by theGET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| array(Pdtq) | M | 0..N | 200 OK | Successful case. All the "Individual PDTQ Policy Subscription" resource(s) managed by the NEF are returned.If there are no active "Individual PDTQ Policy Subscription" resources at the NEF, an empty array is returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] shall also apply. |

Table 5.31.1.2.3.2-4: Headers supported by the 307 Response Code on this resource

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

Table 5.31.1.2.3.2-5: Headers supported by the 308 Response Code on this resource

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

\* \* \* \* Next changes \* \* \* \*

###### 5.31.1.2.3.3 POST

The HTTP POST method allows to create a new PDTQ Policy Subscription at the NEF.

This method shall support the URI query parameters specified in table 5.31.1.2.3.3-1.

Table 5.31.1.2.3.3-1: 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 5.31.1.2.3.3-2 and the response data structures and response codes specified in table 5.31.1.2.3.3-3.

Table 5.31.1.2.3.3-2: Data structures supported by the POSTRequest Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| Pdtq | M | 1 | Contains the parameters to request the creation of a new PDTQ Policy Subscription at the NEF. |

Table 5.31.1.2.3.3-3: Data structures supported by thePOST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| Pdtq | M | 1 | 201 Created | Successful case. A representation of the created "Individual PDTQ Policy Subscription" resource is returned in the response body.The URI of the created resource shall be returned in an HTTP "Location" header. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] shall also apply. |

Table 5.31.1.2.3.3-4: 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-pdtq-policy-negotiation/<apiVersion>/{afId}/subscriptions/{subscriptionId} |

\* \* \* \* Next changes \* \* \* \*

##### 5.31.1.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

\* \* \* \* Next changes \* \* \* \*

##### 5.31.1.3.1 Introduction

This resource represents an "Individual PDTQ Policy Subscription" resource managed by the NEF.

This resource is modelled with the Document resource archetype (see clause C.2 of 3GPP TS 29.501 [3]).

\* \* \* \* Next changes \* \* \* \*

##### 5.31.1.3.2 Resource Definition

Resource URI: **{apiRoot}/3gpp-pdtq-policy-negotiation/<apiVersion>/{afId}/subscriptions/{subscriptionId}**

This resource shall support the resource URI variables defined in table 5.31.1.3.2-1.

Table 5.31.1.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.31.0. |
| afId | string | Represents the identifier of the AF. |
| subscriptionId | string | Represents the identifier of the "Individual PDTQ Policy Subscription" resource. |

\* \* \* \* Next changes \* \* \* \*

##### 5.31.1.3.3 Resource Standard Methods

\* \* \* \* Next changes \* \* \* \*

###### 5.31.1.3.3.1 Void

\* \* \* \* Next changes \* \* \* \*

###### 5.31.1.3.3.2 GET

The HTTP GET method allows to retrieve an existing "Individual PDTQ Policy Subscription" resource at the NEF.

This method shall support the URI query parameters specified in table 5.31.1.3.3.2-1.

Table 5.31.1.3.3.2-1: URI query parameters supported by theGETmethod on this resource

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

This method shall support the request data structures specified in table 5.31.1.3.3.2-2 and the response data structures and response codes specified in table 5.31.1.3.3.2-3.

Table 5.31.1.3.3.2-2: Data structures supported by the GETRequest Body on this resource

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

Table 5.31.1.3.3.2-3: Data structures supported by theGET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| Pdtq | M | 1 | 200 OK | Successful case. The requested "Individual PDTQ Policy Subscription" resource is successfully returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] shall also apply. |

Table 5.31.1.3.3.2-4: Headers supported by the 307 Response Code on this resource

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

Table 5.31.1.3.3.2-5: Headers supported by the 308 Response Code on this resource

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

\* \* \* \* Next changes \* \* \* \*

###### 5.31.1.3.3.3 PATCH

The PATCH method allows to modify an existing "Individual PDTQ Policy Subscription" resource at the NEF.

This method shall support the URI query parameters specified in table 5.31.1.3.3.3-1.

Table 5.31.1.3.3.3-1: 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 5.31.1.3.3.3-2 and the response data structures and response codes specified in table 5.31.1.3.3.3-3.

Table 5.31.1.3.3.3-2: Data structures supported by the PATCHRequest Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PdtqPatch | M | 1 | Represents the requested modifications to the "Individual PDTQ Policy Subscription" resource. |

Table 5.31.1.3.3.3-3: Data structures supported by thePATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| Pdtq | M | 1 | 200 OK | Successful response. The "Individual PDTQ Policy Subscription " resource is successfully modified and a representation of the updated resource is returned in the response body. |
| n/a |  |  | 204 No Content | Successful response. The "Individual PDTQ Policy Subscription" resource is successfully modified and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] shall also apply. |

Table 5.31.1.3.3.3-4: Headers supported by the 307 Response Code on this resource

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

Table 5.31.1.3.3.3-5: Headers supported by the 308 Response Code on this resource

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

\* \* \* \* Next changes \* \* \* \*

###### 5.31.1.3.3.4 DELETE

The DELETE method allows to delete an existing "Individual PDTQ Policy Subscription" resource at the NEF.

This method shall support the URI query parameters specified in table 5.31.1.3.3.4.-1.

Table 5.31.1.3.3.4-1: URI query parameters supported by theDELETE method on this resource

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

This method shall support the request data structures specified in table 5.31.1.3.3.4-2 and the response data structures and response codes specified in table 5.31.1.3.3.4-3.

Table 5.31.1.3.3.4-2: Data structures supported by the DELETERequest Body on this resource

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

Table 5.31.1.3.3.4-3: Data structures supported by theDELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual PDTQ Policy Subscription" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] shall also apply. |

Table 5.31.1.3.3.4-4: Headers supported by the 307 Response Code on this resource

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

Table 5.31.1.3.3.4-5: Headers supported by the 308 Response Code on this resource

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

\* \* \* \* Next changes \* \* \* \*

##### 5.31.1.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

\* \* \* \* Next changes \* \* \* \*

#### 5.31.2.1 General

Notifications shall comply to clause 5.2.5 of 3GPP TS 29.122 [4].

Table 5.31.2.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description(service operation) |
| PDTQ Warning Notification | {notifUri} | POST | Enbales the NEF to notify a previously subscribed AF on PDTQ warning event(s). |

\* \* \* \* Next changes \* \* \* \*

##### 5.31.2.2.1 Description

This notification is used by the NEF to notify a previously subscribed AF on PDTQ warning event(s), i.e., the changed conditions for a planned data transfer with QoS requirements (e.g., a network performance or DN performance in the area of interest reaches the criteria set by the operator).

\* \* \* \* Next changes \* \* \* \*

##### 5.31.2.2.2 Target URI

The Callback URI "{**notifUri**}" shall be used with the callback URI variables defined in table 5.31.2.2.2-1.

Table 5.31.2.2.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

\* \* \* \* Next changes \* \* \* \*

###### 5.31.2.2.3.1 Notification via HTTP POST

This method shall support the request data structures specified in table 5.31.2.2.3.1-1 and the response data structures and response codes specified in table 5.31.2.2.3.1-2.

Table 5.31.2.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PdtqNotification | M | 1 | Represents the PDTQ Warning Notification. |

Table 5.31.2.2.3.1-2: Data structures supported by the POST Response Body

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

Table 5.31.2.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative AF towards which the notification should be redirected. |

Table 5.31.2.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative AF towards which the notification should be redirected. |

\* \* \* \* Next changes \* \* \* \*

#### 5.31.3.1 General

This clause specifies the application data model supported by the PdtqPolicyNegotiation API. Table 5.31.3.1-1 specifies the data types defined for the PdtqPolicyNegotiation API.

Table 5.31.3.1-1: PdtqPolicyNegotiation API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
|  |  |  |  |
| Pdtq | 5.31.3.3.2 | Represents a PDTQ Policy Subscription. |  |
| PdtqNotification | 5.31.3.3.4 | Represents a PDTQ Warning Notification. |  |
| PdtqPatch | 5.31.3.3.3 | Represents the requested modifications to a PDTQ Policy Subscription. |  |

Table 5.31.3.1-2 specifies data types re-used by the PdtqPolicyNegotiation API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the PdtqPolicyNegotiation API.

Table 5.31.3.1-2: PdtqPolicyNegotiation API re-used Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Reference | Comments |
| AltQosParamSet | 3GPP TS 29.543 [68] | Represents the alternative QoS requirements expressed as a list of individual QoS parameters sets. |
| ApplicationId | 3GPP TS 29.571 [8] | Represents the application identifier. |
| LocationArea5G | 3GPP TS 29.122 [4] | Represents the user location area information. |
| PdtqPolicy | 3GPP TS 29.543 [68] | Represents a PDTQ policy. |
| PdtqReferenceId | 3GPP TS 29.543 [68] | Represents a PDTQ Reference ID. |
| QosParamSet | 3GPP TS 29.543 [68] | Represents the QoS requirements expressed as one or more individual QoS parameters. |
| SupportedFeatures | 3GPP TS 29.571 [8] | Represents the list of supported feature(s) and is used to negotiate the applicability of the optional features. |
| TimeWindow | 3GPP TS 29.122 [4] | Represents a time window. |
| Uri | 3GPP TS 29.122 [4] | Represents a URI. |

#### 5.31.3.2 Void

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
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|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

\* \* \* \* Next changes \* \* \* \*

##### 5.31.3.3.2 Type: Pdtq

Table 5.31.3.3.2-1: Definition of type Pdtq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| altQosParamSets | array(AltQosParamSet) | O | 1..N | Contains the alternative QoS requirements expressed as a list of individual QoS parameters sets in a prioritized order.The lower the index of the array for a given entry, the higher the priority.(NOTE 4) |  |
| altQosRefs | array(string) | O | 1..N | Contains the alternative QoS requirements expressed as a list of QoS References in a prioritized order.The lower the index of the array for a given entry, the higher the priority.(NOTE 3) |  |
| appId | ApplicationId | O | 0..1 | Contains the identifier of the application. |  |
| aspId | string | M | 1 | Contains the identitifier of the application service provider. |  |
| desTimeInts | array(TimeWindow) | M | 1..N | Contains the time interval(s). |  |
| locationArea5G | LocationArea5G | O | 0..1 | Contains the area within which the AF request shall apply. |  |
| notifUri | Uri | O | 0..1 | Contains the URI via which the PDTQ warning notifications should be delivered. |  |
| numberOfUEs | integer | M | 1 | Contains the number of UEs. |  |
| pdtqPolicies | array(PdtqPolicy) | O | 1..N | Contains the PDTQ policies. |  |
| qosParamSet | QosParameterSet | C | 0..1 | Contains the requested QoS requirements expressed as one or more individual QoS parameters.(NOTE 2) |  |
| qosReference | string | C | 0..1 | Contains the requested QoS requirements expressed as a QoS Reference.(NOTE 2) |  |
| referenceId | PdtqReferenceId | O | 0..1 | Contains the identifier of the PDTQ policies of planned data transfer with QoS requirements for an AF. |  |
| selectedPolicy | integer | O | 0..1 | Contains the identity of the selected PDTQ policy.This attribute shall not be present during resource creation, it may be provided only in a subsequent resource update.(NOTE 5) |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| warnNotifEnabled | boolean | O | 0..1 | Indicates whether the PDTQ warning notification is enabled or not.- "true" indicates that the PDTQ warning notification is enabled- "false" indicates that the PDTQ warning notification is disabled.- The default value is "false" when this attribute is omitted. |  |
| suppFeat | SupportedFeatures | O | 0..1 | Contains the list of supported features among the ones defined in clause 5.31.4. |  |
| NOTE 1: Void.NOTE 2: These attributes are mutually exclusive. Either one of them shall be present.NOTE 3: This attribute may be present only if the "qosReference" attribute is present.NOTE 4: This attribute may be present only if the "qosParamSet" attribute is present.NOTE 5: When this attribute is present and set to the value "0", it indicates that no PDTQ policy is selected. |

\* \* \* \* Next changes \* \* \* \*

##### 5.31.3.3.3 Type: PdtqPatch

Table 5.31.3.3.3-1: Definition of type PdtqPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| selectedPolicy | integer | O | 0..1 | Contains the identifier of the selected PDTQ policy.(NOTE) |  |
| warnNotifEnabled | boolean | O | 0..1 | Indicates whether the PDTQ warning notification is enabled or not.- "true" indicates that the PDTQ warning notification is enabled;- "false" indicates that the PDTQ warning notification is not enabled. |  |
| notifUri | Uri | O | 0..1 | Contains the updated URI via which the PDTQ warning notifications should be delivered. |  |
| NOTE: When this attribute is present and set to the value "0", it indicates that no PDTQ policy is selected. |

\* \* \* \* Next changes \* \* \* \*

##### 5.31.3.3.4 Type: PdtqNotification

Table 5.31.3.3.4-1: Definition of type Notification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| pdtqRefId | PdtqReferenceId | M | 1 | Contains the identifier of the PDTQ policy to which the notification corresponds. |  |
| candPolicies | array(PdtqPolicy) | M | 1..N | Contains a list of the candidate PDTQ policies from which the AF may select a new PDTQ policy. |  |

\* \* \* \* Next changes \* \* \* \*

# A.29 PDTQPolicyNegotiation API

openapi: 3.0.0

info:

 title: 3gpp-pdtq-policy-negotiation

 version: 1.0.0-alpha.3

 description: |

 API for PDTQ Policy Negotiation.

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externalDocs:

 description: >

 3GPP TS 29.522 V18.4.0; 5G System; Network Exposure Function Northbound APIs.

 url: 'https://www.3gpp.org/ftp/Specs/archive/29\_series/29.522/'

security:

 - {}

 - oAuth2ClientCredentials: []

servers:

 - url: '{apiRoot}/3gpp-pdtq-policy-negotiation/v1'

 variables:

 apiRoot:

 default: https://example.com

 description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122.

paths:

 /{afId}/subscriptions:

 parameters:

 - name: afId

 description: Represents the identifier of the AF.

 in: path

 required: true

 schema:

 type: string

 get:

 summary: Retrieve all the active PDTQ Policy Subscriptions managed by the NEF.

 operationId: GetPDTQPolicySubscs

 tags:

 - PDTQ Policy Subscriptions (Collection)

 responses:

 '200':

 description: >

 OK. All the Individual PDTQ Policy Subscription resource(s) managed by the NEF are returned.

 If there are no active Individual PDTQ Policy Subscription resources at the NEF, an

 empty array is returned.

 content:

 application/json:

 schema:

 type: array

 items:

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

 minItems: 0

 '307':

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

 '308':

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

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '406':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/406'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

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

 post:

 summary: Create a new PDTQ Policy Subscription.

 operationId: CreatePDTQPolicySubsc

 tags:

 - PDTQ Policy Subscriptions (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: >

 Created. A representation of the created Individual PDTQ Policy Subscription resource is

 returned in the response body.

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: Contains the URI of the newly created resource.

 required: true

 schema:

 type: string

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '411':

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

 '413':

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

 '415':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

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

 callbacks:

 PDTQWarningNotification:

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

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: >

 No Content. The notification is successfully received and acknowledged.

 '307':

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

 '308':

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

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '411':

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

 '413':

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

 '415':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

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

 /{afId}/subscriptions/{subscriptionId}:

 parameters:

 - name: afId

 description: Represents the identifier of the AF.

 in: path

 required: true

 schema:

 type: string

 - name: subscriptionId

 description: Represents the identifier of the Individual PDTQ Policy Subscription resource.

 in: path

 required: true

 schema:

 type: string

 get:

 summary: Retrieve an existing Individual PDTQ Policy Subscription resource at the NEF.

 operationId: GetIndPDTQPolicySubsc

 tags:

 - Individual PDTQ Policy Subscription (Document)

 responses:

 '200':

 description: >

 OK. The requested Individual PDTQ Policy Subscription resource is successfully

 returned in the response body.

 content:

 application/json:

 schema:

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

 '307':

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

 '308':

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

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '406':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/406'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

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

 patch:

 summary: Request the modification of an existing Individual PDTQ Policy Subscription resource.

 operationId: ModifyIndPDTQPolicySubsc

 tags:

 - Individual PDTQ Policy Subscription (Document)

 requestBody:

 required: true

 content:

 application/merge-patch+json:

 schema:

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

 responses:

 '200':

 description: >

 OK. The Individual PDTQ Policy Subscription resource is successfully modified and a

 representation of the updated resource is returned in the response body.

 content:

 application/json:

 schema:

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

 '204':

 description: >

 No Content. The Individual PDTQ Policy Subscription resource is successfully updated

 and no content is returned in the response body.

 '307':

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

 '308':

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

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '411':

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

 '413':

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

 '415':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

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

 delete:

 summary: Request the deletion of an existing Individual PDTQ Policy Subscription resource.

 operationId: DeleteIndPDTQPolicy

 tags:

 - Individual PDTQ Policy (Document)

 responses:

 '204':

 description: >

 No Content. The Individual PDTQ Policy Subscription resource is successfully deleted.

 '307':

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

 '308':

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

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

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

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{tokenUrl}'

 scopes: {}

 schemas:

 Pdtq:

 description: Represents a PDTQ Policy Subscription.

 type: object

 properties:

 altQosParamSets:

 type: array

 items:

 $ref: 'TS29543\_Npcf\_PDTQPolicyControl.yaml#/components/schemas/AltQosParamSet'

 minItems: 1

 description: >

 Contains the alternative QoS requirements as a list of individual QoS parameters

 sets in a prioritized order.

 altQosRefs:

 type: array

 items:

 type: string

 minItems: 1

 description: >

 Contains the alternative QoS requirements as a list of QoS References in a

 prioritized order.

 appId:

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

 aspId:

 description: Contains the identitifier of the application service provider.

 type: string

 desTimeInts:

 type: array

 items:

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

 minItems: 1

 description: Contains the time interval(s).

 locationArea5G:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'

 notifUri:

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

 numberOfUEs:

 type: integer

 description: Contains the number of UEs.

 pdtqPolicies:

 type: array

 items:

 $ref: 'TS29543\_Npcf\_PDTQPolicyControl.yaml#/components/schemas/PdtqPolicy'

 minItems: 1

 description: Contains the PDTQ policies.

 qosParamSet:

 $ref: 'TS29543\_Npcf\_PDTQPolicyControl.yaml#/components/schemas/QosParameterSet'

 qosReference:

 type: string

 description: >

 Contains the requested QoS requirements expressed as a QoS Reference.

 referenceId:

 $ref: 'TS29543\_Npcf\_PDTQPolicyControl.yaml#/components/schemas/PdtqReferenceId'

 selectedPolicy:

 type: integer

 description: >

 Contains the identity of the selected PDTQ policy.

 This attribute shall not be present during resource creation, it may be provided only in

 a subsequent resource update.

 warnNotifEnabled:

 type: boolean

 description: >

 Indicates whether the PDTQ warning notification is enabled (true) or not (false).

 Default value is false when this attribute is omitted.

 suppFeat:

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

 required:

 - aspId

 - desTimeInts

 - numberOfUEs

 oneOf:

 - required: [qosReference]

 - required: [qosParamSet]

 PdtqPatch:

 description: Represents the requested modifications to a PDTQ Policy Subscription.

 type: object

 properties:

 selectedPolicy:

 type: integer

 description: Contains the identity of the selected PDTQ policy.

 warnNotifEnabled:

 type: boolean

 description: >

 Indicates whether the PDTQ warning notification is enabled (true) or not (false).

 notifUri:

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

 PdtqNotification:

 description: Represents a PDTQ Warning Notification.

 type: object

 properties:

 pdtqRefId:

 $ref: 'TS29543\_Npcf\_PDTQPolicyControl.yaml#/components/schemas/PdtqReferenceId'

 candPolicies:

 type: array

 items:

 $ref: 'TS29543\_Npcf\_PDTQPolicyControl.yaml#/components/schemas/PdtqPolicy'

 minItems: 1

 description: >

 Contains a list of the candidate PDTQ policies from which the AF may select

 a new PDTQ policy due to network performance or DN performance degradation.

 required:

 - pdtqRefId

 - candPolicies

\* \* \* \* End of changes \* \* \* \*