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**5G System;**
**Usage of the Unified Data Repository Service for Policy Data, Application Data and Structured Data for Exposure;**
**Stage 3**
**(3GPP TS 29.519 version 15.0.0 Release 15)**

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# Contents

# Foreword

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# 1 Scope

The present specification provides the stage 3 definition for the usage of the Unified Data Repository service (Nudr_DataRepository) of 5G System for Policy Data, Application Data and Structured Data for Exposure.

The Unified Data Repository (UDR) provides the Unified Data Repository service. This service provides a repository for policy data, application data and exposure data.

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

[2] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[3] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[4] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

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

[6] 3GPP TS 29.504:"5G System; Unified Data Repository Services; Stage 3".

[7] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces Stage 3".

[8] 3GPP TS 29.551: "5G System; Packet Flow Description Management Service; Stage 3".

[9] 3GPP TS 29.122: "T8 reference point for Northbound APIs".

[10] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

# 3 Definitions and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

PCF Policy Control Function

NEF Network Exposure Function

UDR Unified Data Repository

# 4 Overview

# 5 Usage of Nudr_DataRepository Service API for Policy Data

## 5.1 Introduction

## 5.2 Resources

### 5.2.1 Overview

### 5.2.2 Resource Structure

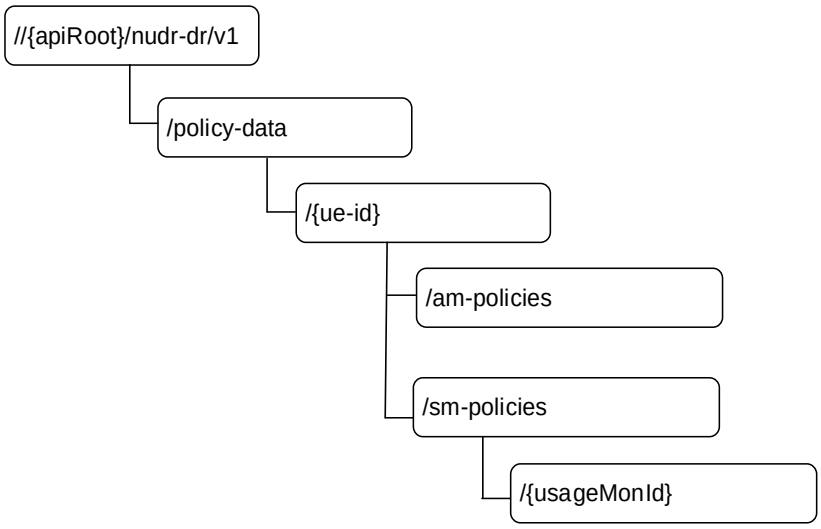


**Figure 5.2.2-1: Resource URI structure of the Nudr_DataRepository API for policy data**

Table 5.2.2-1 provides an overview of the resources and applicable HTTP methods.

**Table 5.2.2-1: Resources and methods overview**

| Resource name | Resource URI | HTTP method or custom operation | Description |
|---|---|---|---|
| AccessAndMobilityPolicies | {apiRoot}/nudr-dr/v1/{ue-id}/am-policies | GET | Retrieves the access and mobility policy data for a subscriber. |
| | | PUT(FFS) | Modifies am-policies. |
| SessionManagementPolicies | {apiRoot}/nudr-dr/v1/{ue-id}/sm-policies | GET | Retrieves the session management policy data for a subscriber. |
| UsageMonitoringInformation | {apiRoot}/nudr-dr/v1/{ue-id}/sm-policies/{usageMonId} | GET | Retrieve a usage monitoring resource. |
| | {apiRoot}/nudr-dr/v1/{ue-id}/sm-policies/{usageMonId} | PUT | Modify or create a usage monitoring resource |
| | {apiRoot}/nudr-dr/v1/{ue-id}/sm-policies/{usageMonId} | DELETE | Delete a usage monitoring resource. |

## 5.2.3 Resource: AccessAndMobilityPolicies

### 5.2.3.1 Description

The "am-policies" resource represents all UE related mobility and access policies attributes in the UDR for a given "ueId".

### 5.2.3.2 Resource definition

Resource URI: **{apiRoot}/nudr-dr/v1/policy-data/{ue-id}/am-policies**

This resource shall support the resource URI variables defined in table 5.2.3.2-1.

**Table 5.2.3.2-1: Resource URI variables for this resource**

| Name | Definition |
|---|---|
| apiRoot | See 3GPP TS 29.504 [6] subclause 6.1 |
| ue-id | Represents the Subscription Identifier SUPI or GPSI (see 3GPP TS 23.501 [2] clause 5.9.2)<br>pattern: "(imsi-[0-9]{5,15}\|nai-.+\|msisdn-[0-9]{5,15}\|extid-.+\|.+)" |

### 5.2.3.3 Resource Standard Methods

#### 5.2.3.3.1 GET

This method shall support the URI query parameters specified in table 5.2.3.3.1-1.

**Table 5.2.3.3.1-1: 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 5.2.3.3.1-2 and the response data structures and response codes specified in table 5.2.3.3.1-3.

**Table 5.2.3.3.1-2: Data structures supported by the GET Request Body on this resource**

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

**Table 5.2.3.3.1-3: Data structures supported by the GET Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| AccessAndMobilityPolicies (FFS) | M | 1..N | 200 OK | Upon success, a response body containing access and mobility policies shall be returned. |

## 5.2.4 Resource: SessionManagementPolicies

### 5.2.4.1 Description

The "sm-policies" resource represents all PDU session related subscription attributes in the UDR for a given ueId.

### 5.2.4.2 Resource definition

Resource URI: **{apiRoot}/nudr-dr/v1/policy-data/{ue-id }/sm-policies**

This resource shall support the resource URI variables defined in table 5.2.4.2-1.

**Table 5.2.4.2-1: Resource URI variables for this resource**

| Name | Definition |
|---|---|
| apiRoot | See 3GPP TS 29.504 [6] subclause 6.1.1 |
| ueId | Represents the Subscription Identifier SUPI or GPSI (see 3GPP TS 23.501 [2] clause 5.9.2)<br>pattern: "(imsi-[0-9]{5,15}\|nai-.+\|msisdn-[0-9]{5,15}\|extid-.+\|.+)" |

### 5.2.4.3 Resource Standard Methods

#### 5.2.4.3.1 GET

This method shall support the URI query parameters specified in table 5.2.4.3.1-1.

**Table 5.2.4.3.1-1: 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 5.2.4.3.1-2 and the response data structures and response codes specified in table 5.2.4.3.1-3.

**Table 5.2.4.3.1-2: Data structures supported by the GET Request Body on this resource**

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

**Table 5.2.4.3.1-3: Data structures supported by the GET Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| SessionManagementPolicies (FFS) | M | 1 | 200 OK | Upon success, a response body containing SmPolicies shall be returned. |

## 5.2.5 Resource: UsageMonitoringInformation

### 5.2.5.1 Description

The individual SM Policy resource represents an individual usage monitoring resource created in the UDR and associated with a ueId.

### 5.2.5.2 Resource definition

Resource URI: **{apiRoot}/nudr-dr/v1/policy-data/sm-policies/{usageMonId}**

This resource shall support the resource URI variables defined in table 5.2.5.2-1.

**Table 5.2.5.2-1: Resource URI variables for this resource**

| Name | Definition |
|---|---|
| apiRoot | See 3GPP TS 29.504 [6] |
| usageMonId | Unique identifier of the individual SM Policy usage monitoring resource. |

### 5.2.5.3 Resource Standard Methods

#### 5.2.5.3.1 PUT

This method shall support the URI query parameters specified in table 5.2.5.3.1-1.

**Table 5.2.5.3.1-1: 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 5.2.5.3.1-2 and the response data structures and response codes specified in table 5.2.5.3.1-3.

**Table 5.2.5.3.1-2: Data structures supported by the PUT Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| UsageMonitoringInformation | M | 1 | Contains the modification(s) of the usage monitoring resource. |

**Table 5.2.5.3.1-3: Data structures supported by the PUT Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | 204 No Content | Successful case.<br>The resource has been successfully updated and no additional content is to be sent in the response message. |
| | | | 201 Created | Successful case.<br>The resource has been successfully created and a response body is returned containing a representation of the resource. |

# 5.3 Notifications

# 5.4 Data Model

## 5.4.1 General

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

Table 5.4.1-1 specifies the data types defined for the Nudr service based interface protocol.

**Table 5.4.1-1: Nudr specific Data Types**

| Data type | Section defined | Description | Applicability |
|---|---|---|---|
| AllServ | FFS | List of subscriber's allowed service identifiers | |
| MonKey (FFS) | FFS | An identifier to a usage monitoring control instance that includes one or more PCC rules | |
| SmPolicyControlNotif | FFS | Contains the update of the SM policies | |
| SubCategory | FFS | List of category identifiers associated with the subscriber | |
| UmLevel | FFS | Indicates the scope of the usage monitoring instance (PDU Session level or per Service | |

Table 5.4.1-2 specifies data types re-used by the Nudr service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nudr service based interface.

**Table 5.4.1-2: Nudr re-used Data Types**

| Data type | Reference | Comments | Applicability |
|---|---|---|---|
| BitRate | 3GPP TS 29.571 [7] | String representing a bit rate that shall be formatted as follows:<br><br>pattern: "^\d+(\.\d+)? (bps\|Kbps\|Mbps\|Gbps\|Tbps)$"<br>Examples:<br>"125 Mbps", "0.125 Gbps", "125000 Kbps"<br><br>In an OpenAPI Specification [3] schema, the format shall be designated as "BitRate". | |
| DurationSec | 3GPP TS 29.571 [7] | Unsigned integer identifying a period of time in units of seconds. In an OpenAPI Specification [3] schema, the format shall be designated as "DurationSec". | |
| DateTime | 3GPP TS 29.571 [7] | | |
| Volume | 3GPP TS 29.122 [9] | | |

## 5.4.2 Structured data types

### 5.4.2.1 Introduction

This subclause defines the structures to be used in resource representations.

Allowed structures are: array, object.

### 5.4.2.2 Type

**Table 5.4.2.2-1: Nudr_DataRepository Policy Data data types**

| Attribute name | Data type | P | Cardinality | Description | App |
|---|---|---|---|---|---|
| ueId | UeId | M | 1 | | |
| allowServices | AllServ | | | List of subscriber's allowed service identifiers | |
| subCategories | subCategory | | | List of category identifiers associated with the subscriber | |
| gbrUl | BitRate | O | 0..N | Maximum aggregate UL bitrate that can be provided across all GBR QoS Flows in the DNN | |
| gbrDL | BitRate | O | 0..N | Maximum aggregate DL bitrate that can be provided across all GBR QoS Flows in the DNN | |
| AdcSupport | boolean | O | 0..1 | Indicates whether application detection and control can be enabled for a subscriber. | |
| subSpendinglimits | boolean | O | 0..1 | Indicates whether the PCF must enforce policies based on subscriber spending limits | |
| ipIndex | FFS | O | 0..1 | Information that identifies the IP Address allocation method during PDU Session establishment | |
| Offline | boolean | O | 0..1 | Indicates the online charging is applicable to the PDU session. | |
| Online | boolean | O | 0..1 | Indicates the offline charging is applicable to the PDU session. | |
| chfAddr | string | O | 0..1 | The address of the Charging Function | |
| monKey (FFS) (NOTE 1) | MonKey (FFS) | O | 0..N | An identifier to a usage monitoring control instance that includes one or more PCC rules | |
| usageMonitoringlevel (FFS) (NOTE 1) | UmLevel | | | Indicates the scope of the usage monitoring instance (PDU Session level or per Service | |
| startDate (FFS) (NOTE 1) | DateTime | O | 0..N | Start date and time when the usage monitoring instance applies | |
| endDate (FFS) (NOTE 1) | DateTime | O | 0..N | End date and time when the usage monitoring instance applies | |
| volLimit (FFS) (NOTE 1) | Volume | O | 0..N | Maximum allowed traffic volume for a usage monitoring instance. | |
| timeLimit (FFS) (NOTE 1) | DateTime | O | 0..N | Maximum allowed resource time usage for a usage monitoring instance. | |
| resetPeriod (FFS) (NOTE 1) | DateTime | O | 0..N | Time period to reset the accumulated consumed usage for a periodic usage monitoring instance (postpaid subscriptions) | |
| mpsPriority | FFS | | | Indicates subscription to the MPS priority service; priority applies to all traffic on the PDU Session | |
| imsSignallingprio | FFS | | | Indicates subscription to the IMS signalling priority service; priority only applies to IMS signalling traffic | |
| mpsPrioritylevel | FFS | | | Relative priority level for the multimedia priority services | |
| uePolicies | map(policy fragments) (FFS) | O | 0..N | PSI is used as a key for the ue policies | |
| psi | array(PSI) (FFS) | M | 1..N | Identifier for the policies | |

: PDU Session policy control subscription information can contain multiple usage monitoring
n key monkey.

**Table 5.4.2.2-2: Nudr_DataRepository Accumulated Usage Policy Data data types**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| monKey (NOTE 1) | MonKey (FFS) | M | 1..N | Identifier to a usage monitoring control instance that includes one or more PCC rules | |
| volUsage (Note 1) | Volume | C | 0..N | Accumulated traffic volume for a usage monitoring instance. | |
| timeUsage (Note 1) | DateTime | C | 0..N | Accumulated resource time usage for a usage monitoring instance | |
| NOTE 1: The Accumulated usage information can contain multiple usage monitoring instances, with key monKey. | | | | | |

## 5.5 Error handling

Table 5.5-1 lists common response body data structures used within Nudr_dr API policy data.

**Table 5.5-1: Common Response Body Data Structures**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| | | | | |
| NOTE: Error response codes defined in 3GPP TS 29.504 [6] are supported. | | | | |

## 5.6 Feature negotiation

# 6 Usage of Nudr_DataRepository Service API for Application Data

## 6.1 Introduction

The request URI used in each HTTP request from the NF service consumer towards the UDR shall have the structure defined in subclause 4.4.1 of 3GPP TS 29.501 [2], i.e.:

**{apiRoot}/{apiName}/{apiVersion}/{apiSpecificResourceUriPart}**

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [2].
- The {apiName} shall be "nudr-dr".
- The {apiVersion} shall be "v1".
- The {apiSpecificResourceUriPart} shall be set as described in subclause 6.2.

## 6.2 Resources

### 6.2.1 Overview

### 6.2.2 Resource Structure

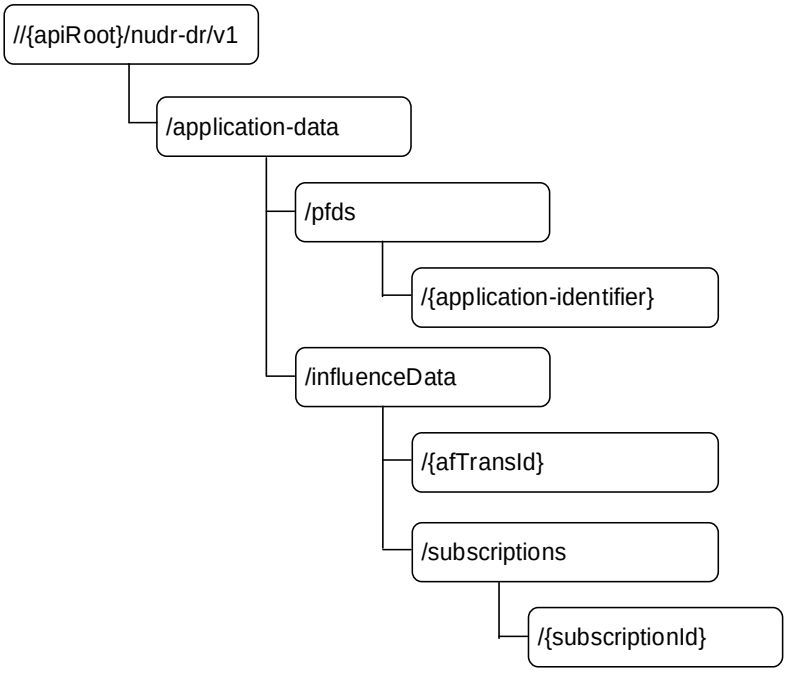


**Figure 6.2.2-1: Resource URI structure of the Nudr_DataRepository API for application data**

Editor's note: It is FFS if appRequestInfo or other descriptor is to be used in the resource structure. As described in 3GPP TS 23.503 subclause 6.2.1.6, the management of application request information for multiple UEs is defined in subclause 6.3.7.2 of 3GPP TS 23.501 [2]. As described in 3GPP TS 23.501 [2] subclause 6.3.7.2, application Function influence on traffic routing described in clause 5.6.7 of 3GPP TS 23.501 [2] is an example of such requirement.

Table 6.2.2-1 provides an overview of the resources and applicable HTTP methods.

**Table 6.2.2-1: Resources and methods overview**

| Resource name | Resource URI | HTTP method or custom operation | Description |
|---|---|---|---|
| Application Data | {apiRoot}/nudr-dr/v1/application-data/pfds | GET | Retrieve PFDs for application identifier(s) identified by query parameter(s)<br>Retrieve PFDs for all application identifier(s) if no query parameter is included in the resource URI the application data for a subscriber |
| Individual PFD Data | {apiRoot}/nudr-dr/v1/application-data/pfds/{application-identifier} | GET | Retrieve the corresponding PFDs of the specified application identifier |
| | | DELETE | Delete the corresponding PFDs of the specified application identifier |
| | | PUT | Create or update the corresponding PFDs for application identifier |
| Influence Data | {apiRoot}/nudr-dr/v1/application-data/influenceData | GET | Retrieve the Session Influence Data of a given S-NSSAI and DNN or Internal Group Identifier. |
| Individual Influence Data | {apiRoot}/nudr-dr/v1/application-data/influenceData/{afServiceId} | PUT | Create an Influence Data identified by {afServiceId}, or modify all of the properties of an individual Influence Data identified by {afServiceId} |
| | | PATCH | Modify part of the properties of an individual Influence Data identified by {afServiceId} |
| | | DELETE | Delete an individual Influence Data identified by {afServiceId} |
| Influence Data Subscription | {apiRoot}/nudr-dr/v1/application-data/InfluenceData/subscriptions | POST | Create a new Individual Influence Data Subscription. |
| | | GET | Read all the subscriptions. |
| Individual Influence Data Subscription | {apiRoot}/nudr-dr/v1/application-data/InfluenceData/subscriptions/{subscriptionId} | GET | Get an existing Influence Data Subscription identified by {subscriptionId}. |
| | | PUT | Modify an existing Influence Data Subscription identified by {subscriptionId}. |
| | | DELETE | Delete an Individual Influence Data Subscription identified by {subscriptionId}. |

## 6.2.3 Resource: PFD Data

### 6.2.3.1 Description

The PFD Data resource represents all the PFD Datas to the Nudr_DataManagement Service at a given UDR.

### 6.2.3.2 Resource definition

Resource URI: **{apiRoot}/nudr-dr/v1/application-data/pfds**

**Table 6.2.3.2-1: Resource URI variables for this resource**

| Name | Definition |
|---|---|
| apiRoot | See subclause 6.1 |

### 6.2.3.3 Resource Standard Methods

#### 6.2.3.3.1 GET

This method shall support the URI query parameters specified in table 6.2.3.3.1-1.

**Table 6.2.3.3.1-1: URI query parameters supported by the GET method on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| appId | array(ApplicationId) | O | 0..N | Contains the information of the application identifier(s) for the querying PFD Data resource.<br>If none appId is included in the URI, it applies to all application identifier(s) for the querying PFD Data resource. |

This method shall support the request data structures specified in table 6.2.3.3.1-2 and the response data structures and response codes specified in table 6.2.3.3.1-3.

**Table 6.2.3.3.1-2: Data structures supported by the GET Request Body on this resource**

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

**Table 6.2.3.3.1-3: Data structures supported by the GET Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| map(PfdData) | M | 0..N | 200 OK | A representation of PFDs for request applications is returned. |
| n/a | | | 404 Not Found | If the Individual PFD Data resource does not exist, the UDR shall responds with "404 Not Found ". |

## 6.2.4 Resource: Individual PFD Data

### 6.2.4.1 Description

The Individual PFD Data resource represents Individual PFD Datas to the Nudr_DataManagement Service at a given UDR.

### 6.2.4.2 Resource definition

Resource URI: **{apiRoot}/nudr-dr/v1/application-data/pfds/{application-identifier}**

This resource shall support the resource URI variables defined in table 6.2.4.2-1.

**Table 6.2.4.2-1: Resource URI variables for this resource**

| Name | Definition |
|---|---|
| apiRoot | See subclause 6.1 |
| application-identifier | Indicate the application identifier for the request pfd(s).<br>It shall apply the format of Data type ApplicationId. |

### 6.2.4.3 Resource Standard Methods

#### 6.2.4.3.1 GET

This method shall support the URI query parameters specified in table 6.2.4.3.1-1.

**Table 6.2.4.3.1-1: 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 6.2.4.3.1-2 and the response data structures and response codes specified in table 6.2.4.3.1-3.

**Table 6.2.4.3.1-2: Data structures supported by the GET Request Body on this resource**

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

**Table 6.2.4.3.1-3: Data structures supported by the GET Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| PfdData | M | 1 | 200 OK | A representation of PFDs for the request application identified by the application-identifier is returned. |

### 6.2.4.3.2 DELETE

This method shall support the URI query parameters specified in table 6.2.4.3.2-1.

**Table 6.2.4.3.2-1: 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 6.2.4.3.2-2 and the response data structures and response codes specified in table 6.2.4.3.2-3.

**Table 6.2.4.3.2-2: Data structures supported by the DELETE Request Body on this resource**

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

**Table 6.2.4.3.2-3: 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.<br>The Individual PFD Data resource related to the application-identifier was deleted. |
| n/a | | | 404 Not Found | If the Individual PFD Data resource does not exist, the UDR shall responds with "404 Not Found ". |

### 6.2.4.3.3 PUT

This method shall support the URI query parameters specified in table 6.2.4.3.3-1.

**Table 6.2.4.3.3-1: 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 6.2.4.3.3-2 and the response data structures and response codes specified in table 6.2.4.3.3-3.

**Table 6.2.4.3.3-2: Data structures supported by the PUT Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| PfdData | M | 1 | Contains the information for the creation of a new PFD Data resource. |

**Table 6.2.4.3.3-3: Data structures supported by the PUT Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| PfdData | M | 1 | 201 Created | Successful case.<br>The creation or upgrade of an Individual PFD Data resource related to the application-identifier is confirmed and a representation of that resource is returned. |
| n/a | | | 404 Not Found | If the Individual PFD Data resource does not exist, the UDR shall responds with "404 Not Found ". |

## 6.2.5 Resource: Influence Data

### 6.2.5.1 Description

The Influence Data resource represents a Traffic Influence Data to the Nudr_DataManagement Service at a given UDR.

### 6.2.5.2 Resource definition

Resource URI: **{apiRoot}/nudr-dr/v1/application-data/influenceData**

This resource shall support the resource URI variables defined in table 6.2.5.2-1.

**Table 6.2.5.2-1: Resource URI variables for this resource**

| Name | Definition |
|---|---|
| apiRoot | See subclause 6.1 |

### 6.2.5.3 Resource Standard Methods

#### 6.2.5.3.1 GET

This method shall support the URI query parameters specified in table 6.2.5.3.1-1.

**Table 6.2.5.3.1-1: URI query parameters supported by the GET method on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| afServiceId | string | C | 0..1 | Identifies a service. |
| dnn | Dnn | C | 0..1 | Identifies a DNN.<br>(NOTE) |
| snssai | SliceInfo | C | 0..1 | Identifies a slice.<br>(NOTE) |
| externalGroupId | ExternalGroupId | C | 0..1 | Identifies a group of users.<br>(NOTE) |
| externalId | ExternalId | C | 0..1 | Identifies a user.<br>(NOTE) |
| gpsi | Gpsi | C | 0..1 | Identifies a user.<br>(NOTE) |
| NOTE: One of afTansId, snssai and DNN, individual UE identifier (i.e. "gpsi" or "externalId"), or External Group Identifier (i.e. "exterGroupId") shall be included. | | | | |

This method shall support the request data structures specified in table 6.2.5.3.1-2 and the response data structures and response codes specified in table 6.2.5.3.1-3.

**Table 6.2.5.3.1-2: Data structures supported by the GET Request Body on this resource**

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

**Table 6.2.5.3.1-3: Data structures supported by the GET Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| map(TrafficInfluData) | M | 0..N | 200 OK | The Traffic Influence Data stored in the UDR are returned. |

## 6.2.6 Resource: Individual Influence Data

### 6.2.6.1 Description

The Individual Influence Data resource represents an Individual Traffic Influence Data to the Nudr_DataManagement Service at a given UDR.

### 6.2.6.2 Resource definition

Resource URI: **{apiRoot}/nudr-dr/v1/application-data/influenceData/{afServiceId}**

This resource shall support the resource URI variables defined in table 6.2.6.2-1.

**Table 6.2.6.2-1: Resource URI variables for this resource**

| Name | Definition |
|---|---|
| apiRoot | See subclause 6.1 |
| afTransId | The Identifier of an Individual Influence Data to be updated.<br>It shall apply the format of Data type string. |

### 6.2.6.3 Resource Standard Methods

#### 6.2.6.3.1 PUT

This method shall support the URI query parameters specified in table 6.2.6.3.1-1.

**Table 6.2.6.3.1-1: URI query parameters supported by the PUT method on this resource**

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

This method shall support the request data structures specified in table 6.2.6.3.1-2 and the response data structures and response codes specified in table 6.2.6.3.1-3.

**Table 6.2.6.3.1-2: Data structures supported by the PUT Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| TrafficInfluData | M | 1 | The Traffic Influence Data to be stored in the UDR. |

**Table 6.2.6.3.1-3: Data structures supported by the PUT Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | 200 OK | The update of an Individual Traffic Influence Data resource is confirmed. |

#### 6.2.6.3.2 PATCH

This method shall support the URI query parameters specified in table 6.2.6.3.2-1.

**Table 6.2.6.3.2-1: URI query parameters supported by the PATCH method on this resource**

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

This method shall support the request data structures specified in table 6.2.6.3.2-2 and the response data structures and response codes specified in table 6.2.6.3.2-3.

**Table 6.2.6.3.2-2: Data structures supported by the PATCH Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| TrafficInfluDataPatch | M | 1 | The Traffic Influence Data to be updated in the UDR. |

**Table 6.2.6.3.2-3: Data structures supported by the PATCH Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | 200 OK | The update of an Individual Traffic Influence Data resource is confirmed. |

### 6.2.6.3.3 DELETE

This method shall support the URI query parameters specified in table 6.2.6.3.3-1.

**Table 6.2.6.3.3-1: URI query parameters supported by the DELETE method on this resource**

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

This method shall support the request data structures specified in table 6.2.6.3.3-2 and the response data structures and response codes specified in table 6.2.6.3.3-3.

**Table 6.2.6.3.3-2: Data structures supported by the DELETE Request Body on this resource**

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

**Table 6.2.6.3.3-3: Data structures supported by the DELETE Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | 204 No Content | The Individual Influence Data was deleted successfully. |

## 6.2.7 Resource: Influence Data Subscription

### 6.2.7.1 Description

The Influence Data Subscription resource represents all Influence Data subscriptions to the Nudr_DataManagement Service at a given UDR.

### 6.2.7.2 Resource definition

Resource URI: **{apiRoot}/nudr-dr/v1/application-data/influenceData/subscription**

This resource shall support the resource URI variables defined in table 6.2.7.2-1.

**Table 6.2.7.2-1: Resource URI variables for this resource**

| Name | Definition |
|---|---|
| apiRoot | See subclause 6.1 |

### 6.2.7.3 Resource Standard Methods

#### 6.2.7.3.1 POST

This method shall support the URI query parameters specified in table 6.2.7.3.1-1.

**Table 6.2.7.3.1-1: URI query parameters supported by the POST method on this resource**

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

This method shall support the request data structures specified in table 6.2.7.3.1-2 and the response data structures and response codes specified in table 6.2.7.3.1-3.

**Table 6.2.7.3.1-2: Data structures supported by the POST Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| TrafficInfluSub | M | 1 | Parameters to register a subscription to Traffic Influence Data |

**Table 6.2.7.3.1-3: Data structures supported by the POST Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| TrafficInfluSub | M | 1 | 201 Created | The subscription was created successfully. |

#### 6.2.7.3.2 GET

This method shall support the URI query parameters specified in table 6.2.7.3.2-1.

**Table 6.2.7.3.2-1: URI query parameters supported by the GET method on this resource**

| Name | Data type | P | Cardinality | Description |
|---|---|---|---|---|
| afServiceId | string | C | 0..1 | Identifies a service. |
| dnn | Dnn | C | 0..1 | Identifies a DNN.<br>(NOTE) |
| snssai | SliceInfo | C | 0..1 | Identifies a slice.<br>(NOTE) |
| externalGroupId | ExternalGroupId | C | 0..1 | Identifies a group of users.<br>(NOTE) |
| externalId | ExternalId | C | 0..1 | Identifies a user.<br>(NOTE) |
| gpsi | Gpsi | C | 0..1 | Identifies a user.<br>(NOTE) |
| NOTE: One of afServiceId, snssai and DNN, individual UE identifier (i.e. "gpsi"or "externalId"), or External Group Identifier (i.e. "exterGroupId") shall be included. | | | | |

This method shall support the request data structures specified in table 6.2.7.3.2-2 and the response data structures and response codes specified in table 6.2.7.3.2-3.

**Table 6.2.7.3.2-2: Data structures supported by the GET Request Body on this resource**

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

**Table 6.2.7.3.2-3: Data structures supported by the GET Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| array(TrafficInfluSub) | M | 0..N | 200 OK | The subscription information as request in the request URI query parameter(s) are returned. |

## 6.2.8 Resource: Individual Influence Data Subscription

### 6.2.8.1 Description

The Individual Influence Data Subscription resource represents a single Influence Data subscription to the Nudr_DataManagement Service at a given UDR.

### 6.2.8.2 Resource definition

Resource URI: **{apiRoot}/nudr-dr/v1/application-data/influenceData/subscription/{subscriptionId}**

This resource shall support the resource URI variables defined in table 6.2.8.2-1.

**Table 6.2.8.2-1: Resource URI variables for this resource**

| Name | Definition |
|---|---|
| apiRoot | See subclause 6.1 |
| subscriptionId | String identifying a subscription to the Individual Influence Data Subscription |

### 6.2.8.3 Resource Standard Methods

#### 6.2.8.3.1 GET

This method shall support the URI query parameters specified in table 6.2.8.3.1-1.

**Table 6.2.8.3.1-1: 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 6.2.8.3.1-2 and the response data structures and response codes specified in table 6.2.8.3.1-3.

**Table 6.2.8.3.1-2: Data structures supported by the GET Request Body on this resource**

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

**Table 6.2.8.3.1-3: Data structures supported by the GET Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| TrafficInfluSub | M | 1 | 200 OK | The subscription information is returned. |

#### 6.2.8.3.2 PUT

This method shall support the URI query parameters specified in table 6.2.8.3.2-1.

**Table 6.2.8.3.2-1: 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 6.2.8.3.2-2 and the response data structures and response codes specified in table 6.2.8.3.2-3.

**Table 6.2.8.3.2-2: Data structures supported by the PUT Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| TrafficInfluSubPatch | M | 1 | Modify an existing subscription to Traffic Influence Data. |

**Table 6.2.8.3.2-3: Data structures supported by the PUT Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| TrafficInfluSub | M | 1 | 200 OK | The subscription was updated successfully. |

#### 6.2.8.3.3 DELETE

This method shall support the URI query parameters specified in table 6.2.8.3.3-1.

**Table 6.2.8.3.3-1: 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 6.2.8.3.3-2 and the response data structures and response codes specified in table 6.2.8.3.3-3.

**Table 6.2.8.3.3-2: Data structures supported by the DELETE Request Body on this resource**

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

**Table 6.2.8.3.3-3: Data structures supported by the DELETE Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | 204 No Content | The subscription was terminated successfully. |

## 6.3 Notifications

### 6.3.1 General

Notifications shall comply with subclause 6.2 of 3GPP TS 29.500 [4] and subclause 4.6.2.3 of 3GPP TS 29.501 [2].

**Table 6.3.1-1: Notifications**

| Custom operation URI | Mapped HTTP method | Description |
|---|---|---|
| {pfdsUpdateNotifyUri} | POST | One of notification reference provided by the service consumer during the retrieval or subscription of the PFD Data or the Individual PFD Data. Or the callbackReference of one of the service consumer selected in the same group as discovered during the NRF discovery procedure. |
| {InfluenceDataUpdateNotifyUri} | POST | One of notification reference provided by the service consumer during the retrieval or subscription of the AF Influence Data or the Individual Influence Data. Or the callbackReference of one of the service consumer selected in the same group as discovered during the NRF discovery procedure. |

## 6.3.2 PFDs Update Notification

### 6.3.2.1 Description

The PFDs Update Notification is used by the UDR to report one or several observed PFD(s) to a NF service consumer that has subscribed to such Notifications.

### 6.3.2.2 Operation Definition

URI: **{pfdsUpdateNotifyUri}**

The operation shall support the URI variables defined in table 6.3.2.2-1, the request data structures specified in table 6.3.2.2-2 and the response data structure and response codes specified in table 6.3.2.2-3.

**Table 6.3.2.2-1: URI variables**

| Name | Definition |
|---|---|
| pfdsUpdateNotifyUri | String formatted as URI as Data type Uri.<br>One of notification reference provided by the service consumer during the retrieval or subscription of the PFD Data or the Individual PFD Data. Or the callbackReference of one of the service consumer selected in the same group as discovered during the NRF discovery procedure. |

**Table 6.3.2.2-2: Data structures supported by the POST Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| map(PfdData) | M | 1..N | Provides Information about observed PFD(s). |

**Table 6.3.2.2-3: Data structures supported by the POST Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | 204 No Content | The receipt of the Notification is acknowledged. |

## 6.3.3 Influence Data Update Notification

### 6.3.3.1 Description

The Influence Update Notification is used by the UDR to report one or several observed Influence Data(s) to a NF service consumer that has subscribed to such Notifications.

### 6.3.3.2 Operation Definition

URI: **{InfluenceDataUpdateNotifyUri}**

The operation shall support the URI variables defined in table 6.3.3.2-1, the request data structures specified in table 6.3.3.2-2 and the response data structure and response codes specified in table 6.3.3.2-3.

**Table 6.3.3.2-1: URI variables**

| Name | Definition |
|---|---|
| InfluenceDataUpdateNotifyUri | One of notification reference provided by the service consumer during the retrieval or subscription of the AF Influence Data or the Individual Influence Data. Or the callbackReference of one of the service consumer selected in the same group as discovered during the NRF discovery procedure. |

**Table 6.3.3.2-2: Data structures supported by the POST Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| array(InfluenceData) | M | 1..N | Provides Information about observed Influence Data (s). |

**Table 6.3.3.2-3: Data structures supported by the POST Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | 204 No Content | The receipt of the Notification is acknowledged. |

# 6.4 Data Model

## 6.4.1 General

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

Table 6.4.1-1 specifies the data types defined for the Nudr_DataRepository Service API for Application Data service based interface protocol.

**Table 6.4.1-1: Nudr_DataRepository Service API for Application Data specific Data Types**

| Data type | Section defined | Description | Applicability |
|---|---|---|---|
| | | | |

Table 6.4.1-2 specifies data types re-used by the Nudr_DataRepository Service API for Application Data service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nudr_DataRepository Service API for Application Data service based interface.

**Table 6.4.1-2: Nudr_DataRepository Service API for Application Data re-used Data Types**

| Data type | Reference | Comments | Applicability |
|---|---|---|---|
| ApplicationId | 3GPP TS 29.571 [7] | | |
| Dnai | 3GPP TS 29.571 [7] | | |
| Dnn | 3GPP TS 29.571 [7] | | |
| ExternalGroupId | 3GPP TS 29.122 [9] | | |
| ExternalId | 3GPP TS 29.122 [9] | | |
| FlowInfo | 3GPP TS 29.122 [9] | | |
| Gpsi | 3GPP TS 29.571 [7] | | |
| PfdData | 3GPP TS 29.551 [8] | | |
| Snssai | 3GPP TS 29.571 [7] | | |
| TrafficRoute | 3GPP TS 29.122 [9] | | |
| Uri | 3GPP TS 29.571 [7] | | |

## 6.4.2 Structured data types

### 6.4.2.1 Introduction

This subclause defines the structures to be used in resource representations.

Allowed structures are: array, object.

### 6.4.2.2 Type TrafficInfluData

**Table 6.4.2.2-1: Definition of type TrafficInfluData**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| afServiceId | string | O | 0..1 | Identifies a service on behalf of which the AF is issuing the request. | |
| afTransId | string | O | 0..1 | Identifies an NEF Northbound interface transaction, generated by the AF. | |
| appRelaIndication | boolean | O | 0..1 | Identifies whether an application can be relocated once a location of the application has been selected. | |
| dnn | Dnn | O | 0..1 | | |
| snssai | Snssai | O | 0..1 | | |
| exterGroupId | ExternalGroupId | O | 0..1 | Identifies a group of users. | |
| externalId | ExternalId | O | 0..1 | Identifies a user. | |
| gpsi | Gpsi | O | 0..1 | Identifies a user. | |
| trafficFilters | array(FlowInfo) | O | 0..N | Identifies packet filters. | |
| trafficRoutes | array(TrafficRoute) | M | 1..N | Identifies the N6 traffic routing requirement. | |
| validStartTime | DateTime | O | 0..1 | Identifies when the traffic routings are start to be applicable. | |
| validEndTime | DateTime | O | 0..1 | Identifies when the traffic routings are not applicable. | |
| validGeoZoneIds | array(string) | M | 1..N | Identifies a geographic zone that the AF request applies only to the traffic of UE(s) located in this specific zone. | |

### 6.4.2.3 Type TrafficInfluDataPatch

**Table 6.4.2.3-1: Definition of type TrafficInfluDataPatch**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| afServiceId | string | O | 0..1 | Identifies a service on behalf of which the AF is issuing the request. | |
| afTransId | string | O | 0..1 | Identifies an NEF Northbound interface transaction, generated by the AF. | |
| appRelaIndication | boolean | O | 0..1 | Identifies whether an application can be relocated once a location of the application has been selected. | |
| dnn | Dnn | O | 0..1 | | |
| snssai | Snssai | O | 0..1 | | |
| externalGroupId | ExternalGroupId | O | 0..1 | Identifies a group of users. | |
| externalId | ExternalId | O | 0..1 | Identifies a user. | |
| gpsi | Gpsi | O | 0..1 | Identifies a user. | |
| trafficFilter | FlowInfo | O | 0..N | Identifies a packet filter | |
| trafficRoutes | array(TrafficRoute) | O | 0..N | Identifies the N6 traffic routing requirement. | |
| validStartTime | DateTime | O | 0..1 | Identifies when the traffic routings are start to be applicable. | |
| validEndTime | DateTime | O | 0..1 | Identifies when the traffic routings are not applicable. | |
| validGeoZoneIds | array(string) | O | 1..N | Identifies a geographic zone that the AF request applies only to the traffic of UE(s) located in this specific zone. | |

### 6.4.2.4 Type TrafficInfluSub

**Table 6.4.2.4-1: Definition of type TrafficInfluSub**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| dnn | array(Dnn) | C | 0..N | Identifies a DNN. (NOTE) | |
| snssai | array(Snssai) | C | 0..N | Identifies a slice. (NOTE) | |
| externalGroupId | array(ExternalGroupId) | C | 0..N | Identifies a group of users. (NOTE) | |
| externalId | array(ExternalId) | C | 0..N | Identifies a user. (NOTE) | |
| gpsi | array(Gpsi) | C | 0..N | Identifies the user. (NOTE) | |
| NOTE: One of afTansId, snssai and DNN, individual UE identifier (i.e. "gpsi", "ipv4Addr", "ipv6Addr" or "externalId"), External Group Identifier (i.e. "exterGroupId") or any UE indication "anyUeInd" shall be included. | | | | | |

### 6.4.2.5 Type TrafficInfluSubPatch

**Table 6.4.2.5-1: Definition of type TrafficInfluSubPatch**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| dnn | array(Dnn) | O | 0..N | Identifies the DNNs. (NOTE) | |
| snssai | array(Snssai) | O | 0..N | Identifies the slices. (NOTE) | |
| externalGroupId | array(ExternalGroupId) | O | 0..N | Identifies a group of users. (NOTE) | |
| externalId | array(ExternalId) | O | 0..N | Identifies the users. (NOTE) | |
| gpsi | array(Gpsi) | O | 0..N | Identifies the users. (NOTE) | |

## 6.5 Error handling

### 6.5.1 General

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

For the Nudr_DataRepository Service API for Application Data, HTTP error responses shall be supported as specified in subclause 4.8 of 3GPP TS 29.501 [5]. Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [4] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [4]. In addition, the requirements in the following subclauses shall apply.

### 6.5.2 Protocol Errors

In this Release of the specification, there are no additional protocol errors applicable for the Nudr_DataRepository Service API for Application Data.

### 6.5.3 Application Errors

The application errors defined for the Nudr_DataRepository Service API for Application Data are listed in table 6.5.3-1. The PCF shall include in the HTTP status code a "ProblemDetails" data structure with the "cause" attribute indicating the application error as listed in table 6.5.3-1.

**Table 6.5.3-1: Application errors**

| Application Error | HTTP status code | Description |
|---|---|---|
| PFD_DATA_NOT_FOUND | 404 Not Found | Indicates that the modification has failed because the specified PCF Session Bindings or Individual PCF Session Binding does not exist. (NOTE) |
| NOTE: This application error is included in the responses to the GET and the DELETE requests. | | |

## 6.6 Feature negotiation

The optional features in table 6.7-1 are defined for the Nudr_DataRepository Service API for Application Data. They shall be negotiated using the extensibility mechanism defined in subclause 6.6 of 3GPP TS 29.500 [4].

**Table 6.6-1: Supported Features**

| Feature number | Feature Name | Description |
|---|---|---|
| | | |

# 7 Usage of Nudr_DataRepository Service API for Structured Data for Exposure

## 7.1 Introduction

This clause specifies the resources and data model for the usage of the Unified Data Repository service for Structured Data for Exposure.

## 7.2 Resources

### 7.2.1 Overview

### 7.2.2 Resource Structure

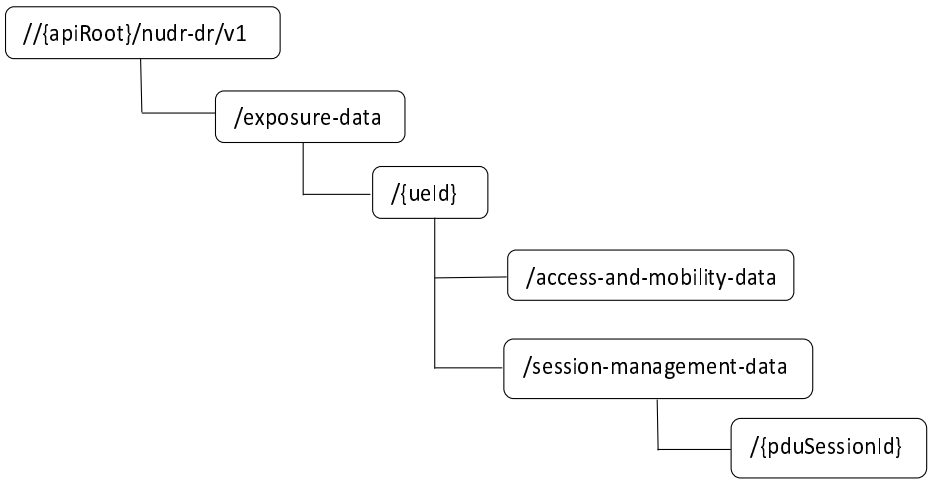


**Figure 7.2.2-1: Resource URI structure of the Nudr_DataRepository API for exposure data**

Table 7.2.2-1 provides an overview of the resources and applicable HTTP methods.

**Table 7.2.2-1: Resources and methods overview**

| Resource name | Resource URI | HTTP method | Description |
|---|---|---|---|
| AccessAndMobility Data | exposure-data/{ueId}/access-and-mobility-data | PUT | Creates and updates the access and mobility exposure data for a UE |
| | | GET | Retrieves the access and mobility exposure data for a UE |
| | | DELETE | Deletes the access and mobility exposure data for a UE |
| SessionManagement Data | exposure-data/{ueId}/session-management-data | | |
| PduSessionManagementData | exposure-data/{ueId}/session-management-data/{pduSessionId} | PUT | Creates and updates the session management data for a UE and for an individual PDU session |
| | | GET | Retrieves the session management data for a UE and for an individual PDU session |
| | | DELETE | Deletes the session management data for a UE and for an individual PDU session |

Editor's note: The addition of a subscription resource is ffs.

## 7.2.3 Resource: AccessAndMobilityData

### 7.2.3.1 Description

This resource represents the exposure data related to access and mobility.

### 7.2.3.2 Resource definition

**Resource URI: {apiRoot}/nudr-dr/v1/exposure-data/{ueId}/access-and-mobility-data**

This resource shall support the resource URI variables defined in table 7.2.3.2-1.

**Table 7.2.3.2-1: Resource URI variables for this resource**

| Name | Definition |
|---|---|
| apiRoot | See 3GPP TS 29.504 [6] subclause 6.1.1. |
| ueId | Represents the SUPI or GPSI.<br>pattern: "(imsi-[0-9]{5,15}\|nai-.+\|msisdn-[0-9]{5,15}\|extid-.+\|.+)". |

### 7.2.3.3 Resource Standard Methods

#### 7.2.3.3.1 PUT

This method shall support the URI query parameters specified in table 7.2.3.3.1-1.

**Table 7.2.3.3.1-1: 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 7.2.3.3.1-2 and the response data structures and response codes specified in table 7.2.3.3.1-3.

**Table 7.2.3.3.1-2: Data structures supported by the PUT Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| AccessAndMobilityData | M | 1 | Access and mobility data for the UE is created. |

**Table 7.2.3.3.1-3: Data structures supported by the PUT Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| AccessAndMobilityData | M | 1 | 201 Created | Upon success, a response body is returned containing a representation of the access and mobility data. |
| NOTE: The HTTP status code for the PUT method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. | | | | |

### 7.2.3.3.2 GET

This method shall support the URI query parameters specified in table 7.2.3.3.2-1.

**Table 7.2.3.3.2-1: 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 7.2.3.3.2-2 and the response data structures and response codes specified in table 7.2.3.3.2-3.

**Table 7.2.3.3.2-2: Data structures supported by the GET Request Body on this resource**

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

**Table 7.2.3.3.2-3: Data structures supported by the GET Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| AccessAndMobilityData | M | 1 | 200 OK | The response body contains the access and mobility data. |
| NOTE: The HTTP status code for the GET method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. | | | | |

### 7.2.3.3.3 DELETE

This method shall support the URI query parameters specified in table 7.2.3.3.3-1.

**Table 7.2.3.3.3-1: 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 7.2.3.3.3-2 and the response data structures and response codes specified in table 7.2.3.3.3-3.

**Table 7.2.3.3.3-2: Data structures supported by the DELETE Request Body on this resource**

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

**Table 7.2.3.3.3-3: Data structures supported by the DELETE Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | 204 No Content | Upon success, an empty response body shall be returned. |
| NOTE: The HTTP status code for the DELETE method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. | | | | |

## 7.2.4 Resource: SessionManagementData

### 7.2.4.1 Description

This resource is used to represent session management data for a UE, stored in the UDR.

### 7.2.4.2 Resource Definition

Resource URI: {apiRoot}/nudr-dr/v1/exposure-data/{ueId}/session-management-data

This resource shall support the resource URI variables defined in table 7.2.4.2-1.

**Table 7.2.4.2-1: Resource URI variables for this resource**

| Name | Definition |
|---|---|
| apiRoot | See 3GPP TS 29.504 [6] subclause 6.1.1 |
| ueId | Represents the SUPI or GPSI.<br>pattern: "(imsi-[0-9]{5,15}\|nai-.+\|msisdn-[0-9]{5,15}\|extid-.+\|.+)" |

## 7.2.5 Resource: PduSessionManagementData

### 7.2.5.1 Description

This resource represents the exposure data related to session and management data for a given subscriber and a given PDU session.

### 7.2.5.2 Resource definition

Resource URI: {apiRoot}/nudr-dr/v1/exposure-data/{ueId}/session-management-data/{pduSessionId}

This resource shall support the resource URI variables defined in table 7.2.5.2-1.

**Table 7.2.5.2-1: Resource URI variables for this resource**

| Name | Definition |
|---|---|
| apiRoot | See 3GPP TS 29.504 [6] subclause 6.1.1 |
| ueId | Represents the SUPI or GPSI.<br>pattern: "(imsi-[0-9]{5,15}\|nai-.+\|msisdn-[0-9]{5,15}\|extid-.+\|.+)" |
| pduSessionId | Identifies an individual PDU session |

### 7.2.5.3 Resource Standard Methods

#### 7.2.5.3.1 PUT

This method shall support the URI query parameters specified in table 7.2.5.3.1-1.

**Table 7.2.5.3.1-1: 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 7.2.5.3.1-2 and the response data structures and response codes specified in table 7.2.5.3.1-3.

**Table 7.2.5.3.1-2: Data structures supported by the PUT Request Body on this resource**

| Data type | P | Cardinality | Description |
|---|---|---|---|
| PduSessionManagementData | M | 1 | Session management data for a UE and a PDU session is created. |

**Table 7.2.5.3.1-3: Data structures supported by the PUT Response Body on this resource**

| Data type | P | Cardinality | Response Codes | Description |
|---|---|---|---|---|
| PduSessionManagementData | M | 1 | 201 Created | Upon success, a response body is returned containing a representation of the session management data. |
| NOTE: The HTTP status code for the PUT method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. | | | | |

### 7.2.5.3.2 GET

This method shall support the URI query parameters specified in table 7.2.5.3.2-1.

**Table 7.2.5.3.2-1: 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 7.2.5.3.2-2 and the response data structures and response codes specified in table 7.2.5.3.2-3.

**Table 7.2.5.3.2-2: Data structures supported by the GET Request Body on this resource**

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

**Table 7.2.5.3.2-3: Data structures supported by the GET Response Body on this resource**

| Data type | P | Cardinality | Response Codes | Description |
|---|---|---|---|---|
| PduSessionManagementData | M | 1 | 200 OK | The response body contains the session management data. |
| NOTE: The HTTP status code for the GET method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. | | | | |

### 7.2.5.3.3 DELETE

This method shall support the URI query parameters specified in table 7.2.5.3.3-1.

**Table 7.2.5.3.3-1: 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 7.2.5.3.3-2 and the response data structures and response codes specified in table 7.2.5.3.3-3.

**Table 7.2.5.3.3-2: Data structures supported by the DELETE Request Body on this resource**

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

**Table 7.2.5.3.3-3: Data structures supported by the DELETE Response Body on this resource**

| Data type | P | Cardinality | Response codes | Description |
|---|---|---|---|---|
| n/a | | | 204 No Content | Upon success, an empty response body shall be returned. |
| NOTE: The HTTP status code for the DELETE method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. | | | | |

# 7.3 Data Model

## 7.3.1 General

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

Table 7.3.1-1 specifies the data types defined for the Nudr service based interface protocol.

**Table 7.3.1-1: Nudr specific Data Types**

| Data type | Section defined | Description | Applicability |
|---|---|---|---|
| PduSessionStatus | 7.3.3.2.1 | Represents the state of the PDU session, i.e. active or released. | |

Table 7.3.1-2 specifies data types re-used by the Nudr service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the $N_{<NF>}$ service based interface.

**Table 7.3.1-2: Nudr re-used Data Types**

| Data type | Reference | Comments | Applicability |
|---|---|---|---|
| AccessType | 3GPP TS 29.571 [7] | | |
| CmState | 3GPP TS 29.518 [10] | | |
| Dnai | 3GPP TS 29.571 [7] | | |
| Dnn | 3GPP TS 29.571 [7] | | |
| Ipv4Addr | 3GPP TS 29.571 [7] | | |
| Ipv6Prefix | 3GPP TS 29.571 [7] | | |
| MacAddr48 | 3GPP TS 29.571 [10] | | |
| PduSessionId | 3GPP TS 29.571 [7] | | |
| PlmnId | 3GPP TS 29.571 [7] | | |
| RatType | 3GPP TS 29.571 [7] | | |
| RmState | 3GPP TS 29.518 [10] | | |
| TimeZone | 3GPP TS 29.571 [7] | | |
| SmsSupport | 3GPP TS 29.518 [10] | | |
| UeReachability | 3GPP TS 29.518 [10] | | |
| UserLocation | 3GPP TS 29.571 [7] | | |

## 7.3.2 Structured data types

### 7.3.2.1 Introduction

This subclause defines the structures to be used in resource representations.

Allowed structures are: array, object.

### 7.3.2.2 Type AccessAndMobilityData

**Table 7.3.2.2-1: Definition of type AccessAndMobilityData**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| ueLocation | UserLocation | O | 0..1 | Current location for the UE, which can be a combination of E-UTRA, NR and non-3GPP access location. | |
| ueTimeZone | TimeZone | O | 0..1 | Current time zone for the UE. | |
| ueAccessType | AccessType | O | 0..1 | Current access type for the UE (3GPP access or non-3GPP access). | |
| ueRegistrationState | RmState | O | 0..1 | Describes the registration management state of the UE. | |
| ueConnectivityState | CmState | O | 0..1 | Describes the connectivity management state of the UE. | |
| ueReachabilityStatus | UeReachability | O | 0..1 | Describes the reachability of the UE. | |
| ueSmsOverNasStatus | SmsSupport | O | 0..1 | Indicates the supported SMS delivery of the UE. | |
| ueRoamingStatus | boolean | O | 0..1 | True: The serving PLMN of the UE is different from the HPLMN of the UE; False: The serving PLMN of the UE is the HPLMN of the UE. | |
| ueCurrentPlmn | PlmnId | O | 0..1 | The identity of the PLMN serving the UE. | |
| dnn | Dnn | O | 0..1 | DNN | |
| macAddr | MacAddr48 | O | 0..1 | Mac Address | |
| ratType | RatType | O | 0..1 | RAT type | |

### 7.3.2.3 Type PduSessionManagementData

**Table 7.3.2.3-1: Definition of type PduSessionManagementData**

| Attribute name | Data type | P | Cardinality | Description | Applicability |
|---|---|---|---|---|---|
| pduSessionStatus | PduSessionStatus | O | 0..1 | Status of the PDU session. | |
| dnai | Dnai | O | 0..1 | DNAI | |
| n6TrafficRoutingInfo | FFS | O | 0..1 | N6 traffic routing information. | |
| ueIpv4Addr | Ipv4Addr | O | 0..1 | UE IPv4 address. | |
| ueIpv6Prefix | array(Ipv6Prefix) | O | 0..N | UE IPv6 prefix. | |

## 7.3.3 Simple data types and enumerations

### 7.3.3.1 Introduction

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

### 7.3.3.2 Simple data types

The simple data types defined in table 7.3.3.2-1 shall be supported.

**Table 7.3.3.2-1: Simple data types**

| Type Name | Type Definition | Description | Applicability |
|---|---|---|---|
| Dnai | string | | |

#### 7.3.3.2.1 Enumeration: PduSessionStatus

**Table 7.3.3.2.1-1: Enumeration PduSessionStatus**

| Enumeration value | Description | Applicability |
|---|---|---|
| "ACTIVE" | | |
| "RELEASED" | | |

## 7.4 Error handling

## 7.5 Feature negotiation

# Annex A (normative): OpenAPI specification

## A.1 General

## A.2 Nudr_DataRepository for Policy Data

## A.3 Nudr_DataRepository for Application Data

## A.4 Nudr_DataRepository for Exposure Data

```
openapi: 3.0.0
info:
  version: 1.0.0
  title: 'UDR Data Repository Service for structured data for exposure'
  description: 'UDR Data Repository Service for structured data for exposure'
servers:
  - description: API root
    url: https://{apiRoot}/nudr-dr/v1
    variables:
      apiRoot:
        default: demohost.com
externalDocs:
  description: Documentation
  url: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.519/'
paths:
  /exposure-data/{ueId}/access-and-mobility-data:
    put:
      summary: Creates and updates the access and mobility exposure data for a UE
      operationId: CreateAccessAndMobilityData
      tags:
        - AccessAndMobilityData
      parameters:
        - name: ueId
          in: path
          description: UE id
          required: true
          schema:
            $ref: '#/components/schemas/VarUeId'
      requestBody:
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/AccessAndMobilityData'
      responses:
        '201':
          description: Upon success, a response body is returned containing a representation of the
access and mobility data
    get:
      summary: Retrieves the access and mobility exposure data for a UE
      operationId: QueryAccessAndMobilityData
      tags:
        - AccessAndMobilityData
      parameters:
        - name: ueId
          in: path
          description: UE id
          required: true
          schema:
            $ref: '#/components/schemas/VarUeId'
      responses:
        '200':
          description: The response body contains the access and mobility data
```

```
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/AccessAndMobilityData'
    delete:
      summary: Deletes the access and mobility exposure data for a UE
      operationId: DeleteAccessAndMobilityData
      tags:
        - AccessAndMobilityData
      parameters:
        - name: ueId
          in: path
          description: UE id
          required: true
          schema:
            $ref: '#/components/schemas/VarUeId'
      responses:
        '204':
          description: Upon success, an empty response body shall be returned
  /exposure-data/{ueId}/session-management-data/{pduSessionId}:
    put:
      summary: Creates and updates the session management data for a UE and for an individual PDU
session
      operationId: CreateSessionManagementData
      tags:
        - PduSessionManagementData
      parameters:
        - name: ueId
          in: path
          description: UE id
          required: true
          schema:
            $ref: '#/components/schemas/VarUeId'
        - name: pduSessionId
          in: path
          description: PDU session id
          required: true
          schema:
            type: integer
      requestBody:
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/PduSessionManagementData'
      responses:
        '201':
          description: Upon success, a response body is returned containing a representation of the
session management data
    get:
      summary: Retrieves the session management data for a UE and for an individual PDU session
      operationId: QuerySessionManagementData
      tags:
        - PduSessionManagementData
      parameters:
        - name: ueId
          in: path
          description: UE id
          required: true
          schema:
            $ref: '#/components/schemas/VarUeId'
        - name: pduSessionId
          in: path
          description: PDU session id
          required: true
          schema:
            type: integer
      responses:
        '200':
          description: The response body contains the session management data
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/PduSessionManagementData'
    delete:
      summary: Deletes the session management data for a UE and for an individual PDU session
      operationId: DeleteSessionManagementData
      tags:
        - PduSessionManagementData
```

```
      parameters:
        - name: ueId
          in: path
          description: UE id
          required: true
          schema:
            $ref: '#/components/schemas/VarUeId'
        - name: pduSessionId
          in: path
          description: PDU session id
          required: true
          schema:
            type: integer
      responses:
        '204':
          description: Upon success, an empty response body shall be returned
components:
  schemas:
    AccessAndMobilityData:
      type: object
      properties:
        ueLocation:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
        ueTimeZone:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
        ueAccessType:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
        ueRegistrationState:
          $ref: 'TS29518_Namf_EventExposure.yaml#/components/schemas/RmState'
        ueConnectivityState:
          $ref: 'TS29518_Namf_EventExposure.yaml#/components/schemas/CmState'
        ueReachabilityStatus:
          $ref: 'TS29518_Namf_EventExposure.yaml#/components/schemas/UeReachability'
        ueSmsOverNasStatus:
          $ref: 'TS29518_Namf_EventExposure.yaml#/components/schemas/SmsSupport'
        ueRoamingStatus:
          type: boolean
          description: True  The serving PLMN of the UE is different from the HPLMN of the UE; False
The serving PLMN of the UE is the HPLMN of the UE.
        ueCurrentPlmn:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        dnn:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
        macAddr:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/MacAddr48'
        ratType:
          $ref: 'TS29517_CommonData.yaml#/components/schemas/RatType'
    PduSessionManagementData:
      type: object
      properties:
        pduSessionStatus:
          $ref: '#/components/schemas/PduSessionStatus'
        dnai:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnai'
        n6TrafficRoutingInfo:
          $ref: '#/components/schemas/FFS'
        ueIpv4Addr:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        ueIpv6Prefix:
          type: array
          items:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
          minItems: 0
          description: UE IPv6 prefix.
    Dnai:
      type: string
    PduSessionStatus:
      anyOf:
      - type: string
        enum:
          - "ACTIVE"
          - "RELEASED"
      - type: string
        description: >
          This string provides forward-compatibility with future
          extensions to the enumeration but is not used to encode
          content defined in the present version of this API.
      description: >
```

```
        Possible values are
        - "ACTIVE"
        - "RELEASED"
    VarUeId:
      type: string
      pattern: '(imsi-[0-9]{5,15}|nai-.+|msisdn-[0-9]{5,15}|extid-.+|.+)'
```

# Annex B (informative): Change history

| Change history | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Date** | **Meeting #** | **TSG Doc.** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New** |
| 2018-01 | CT3#94 | | | | | TS skeleton of Usage of the Unified Data Repository service for Policy Data and Structured Data for exposure | 0.0.0 |
| 2018-01 | CT3#94 | | | | | Inclusion of C3-180352, C3-180326, C3-180327 | 0.1.0 |
| 2018-03 | CT3#95 | | | | | Inclusion of C3-181145, C3-181288, C3-181289, C3-181313 | 0.2.0 |
| 2018-04 | CT3#96 | | | | | Inclusion of C3-182402, C3-182476, C3-182456, C3-182404, C3-182457, C3-182458 | 0.3.0 |
| 2018-05 | CT3#97 | | | | | Inclusion of C3-183872, C3-183705, C3-183704, C3-183873, C3-183732, C3-183706 C3-183874, C3-183709, C3-183876, C3-183263, C3-183877, C3-183712, C3-183715 and editorial changes by Rapporteur | 0.4.0 |
| 2018-06 | CT#80 | CP-181033 | | | | TS sent to plenary for approval | 1.0.0 |
| 2018-06 | CT#80 | CP-181033 | | | | TS approved by plenary | 15.0.0 |

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