**3GPP TSG-CT WG4 Meeting #130C4-253413**

**Gothenburg, Sweden, August 25 – 29, 2025 (revision of C4-253183)**

**Source: Lenovo, China Mobile**

**Title: Pseudo-CR on New UDR service for AIoT**

**Spec: 3GPP TS 29.506 V0.0.0**

**Agenda item: 19.70**

**Document for: Agreement**

**1. Introduction**

CT4 agreed to specify UDR services for AIoT device profile data. This PCR proposes the definition of the UDR data repository service API for AIoT device profile data.

Furthermore, as the UDR DR service is reused from 3GPP TS 29.504, there is no need to specify the services offered by the UDR in clause 5 of this document. Instead, this PCR proposes to specify the resources and data model in clause 5, rather than in clause 6. Please note that the new proposed document structure is aligned with 3GPP TS 29.505 and 3GPP TS 29.519.

**2. Reason for Change**

Updating clause 1, 2, 4, 5, 6, A2 and subclauses.

**3. Conclusions**

This PCR defines a new UDR service for AIoT device profile data.

**4. Proposal**

It is proposed to agree the following changes to 3GPP TS 29.506v0.0.0.

\*\*\* First Change \*\*\*

# 1 Scope

The present document specifies the usage of the Unified Data Repository services for AIoT device profile data. It defines the resource structure and data model for AIoT device profile data accessed via the Nudr Service-Based Interface. In addition, it specifies the protocol aspects of the Nudr Service-Based Interface that are specific to AIoT device profile data.

The stage 3 protocol definition for Nudr Service Based Interface which is common for AIoT device profile data, subscription data, policy data, structure data and application data for exposure is specified in 3GPP TS 29.504 [29504].

The Technical Realization of the Service Based Architecture and the Principles and Guidelines for Services Definition are specified in TS 29.500 [4] and TS 29.501 [5].

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

2 References

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

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

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

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

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

[2] 3GPP TS 23.501: "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] OpenAPI: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.

[7] 3GPP TR 21.900: "Technical Specification Group working methods".

[8] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

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

[10] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[11] IETF RFC 9113: "HTTP/2".

[12] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[13] IETF RFC 9457: "Problem Details for HTTP APIs".

[29504] 3GPP TS 29.504: "5G System; Unified Data Repository Services; Stage 3".

[29571] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces Stage 3".

[29.369] 3GPP TS 29.369: "Ambient IoT Data Management Services".

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

# 4 Overview

The resources, data model and usage defined in the present document are used by the 5GC NFs (e.g. ADM) to access the AIoT device profile data via the Unified Data Repository services as specified in 3GPP TS 29.504 [29504].

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

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# 5 Usage of Nudr\_DataRepository Service API for AIoT device profile data

## 5.1 Introduction

The following clauses specify the usage of Nudr\_DataRepository service for AIoT device profile data. The principles specified in 3GPP TS 29.504 [29504] are followed unless explicitly specified otherwise in the following clauses.

## 5.2 Resources

### 5.2.1 Overview

This clause specifies the resources for the usage of the Unified Data Repository service for AIoT device profile data.

### 5.2.2 Resource Structure

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

Figure 5.2.2-1 depicts the resource URIs structure for the Nudr\_DataRepository API for AIoT device profile data.



Figure 5.2.2-1: Resource URI structure of the Nudr\_DataRepository API for AIoT device profile 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 |
| AiotDeviceProfileData | /aiot-data/aiot-device-profile-data/{aiotDevPermId} | GET | Retrieve the AIoT device profile data for an AIoT device permanent identifier. |
|  |  | PATCH | Modify the AIoT device profile data for an AIoT device permanent identifier. |

### 5.2.3 Resource: AiotDeviceProfileData

#### 5.2.3.1 Description

The resource represents all AIoT device profile data attributes in the UDR for a given "aiotDevPermId".

#### 5.2.3.2 Resource definition

Resource URI: **{apiRoot}/nudr-dr/<apiVersion>/aiot-data/aiot-device-profile-data/{aiotDevPermId}**

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 | Data type | Definition |
| apiRoot | string | See 3GPP TS 29.504 [29504] clause 6.1.1 |
| aiotDevPermId | AiotDevPermId | Represents the AIoT device permanent id. Data type AiotDevPermId is defined in 3GPP TS 29.571 [29571]. |

#### 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 | Responsecodes | Description |
| AiotDeviceProfileData | M | 1 | 200 OK | Upon success, a response body containing AIoT Device Profile Data shall be returned. |
| ProblemDetails | O | 0..1 | 404 Not Found | The "cause" attribute may be used to indicate one of the following application errors:- DATA\_NOT\_FOUND |
| NOTE: The mandatory HTTP error status codes for the GET method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. |

##### 5.2.3.3.2 PATCH

This method shall support the URI query parameters specified in table 5.2.3.3.2-1.

Table 5.2.3.3.2-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| supp-feat | SupportedFeatures | O | 0..1 | The features supported by the NF service consumer. |

This method shall support the request data structures specified in table 5.2.3.3.2-2 and the response data structures and response codes specified in table 5.2.3.3.2-3.

Table 5.2.3.3.2-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| AiotDeviceProfileDataPatch | M | 1 | Modify the aiot device profile data resource for a given AIoT device permanent identifier. |

Table 5.2.3.3.2-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| n/a |  |  | 204 No Content | Upon successful modification there is no body in the response message. (NOTE 2) |
| PatchResult | M | 1 | 200 OK | Upon success, the execution report is returned. (NOTE 2) |
| ProblemDetails | O | 0..1 | 404 Not Found | The "cause" attribute may be used to indicate one of the following application errors:- DATA\_NOT\_FOUND |
| NOTE 1: The mandatory HTTP error status codes for the PATCH method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.NOTE 2: If all the modification instructions in the PATCH request have been implemented, the UDR shall respond with 204 No Content response; if some of the modification instructions in the PATCH request have been discarded, and the NF service consumer has included in the supported-feature query parameter the "PatchReport" feature number, the UDR shall respond with PatchResult. |

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

## 5.3 Data Model

### 5.3.1 General

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

Table 5.3.1-1 specifies the data types defined for the Nudr\_DataRepository for AIoT device profile data service-based interface protocol.

Table 5.3.1-1: Nudr\_DataRepository specific Data Types for AIoT device profile data

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| AiotDeviceProfileData | 5.3.2.2 | AIoT Device Profile Data |  |
| AiotDeviceProfileDataPatch | 5.3.2.3 | AIoT Device Profile Data for patch operation |  |

Table 5.3.1-2 specifies data types re-used by the Nudr\_DataRepository for AIoT Device Profile 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 for AIoT Device Profile Data service based interface.

Table 5.3.1-2: Nudr\_DataRepository re-used Data Types for AIoT Device Profile Data

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AiotDevPermId | 3GPP TS 29.571 [29571] | AIoT device permanent identifier |  |
| LastKnownAiotfInfo | 3GPP TS 29.369 [29369] | Last Known AIoTF Information |  |
| PatchResult | 3GPP TS 29.571 [29571] |  |  |
| ProblemDetails | 3GPP TS 29.571 [29571] | Used in error responses to provide more detailed information about an error. |  |
| SupportedFeatures | 3GPP TS 29.571 [29571] | see 3GPP TS 29.500 [4] clause 6.6 | SupportedFeatures |

### 5.3.2 Structured data types

#### 5.3.2.1 Introduction

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

#### 5.3.2.2 Type AiotDeviceProfileData

Table 5.3.2.2-1: Definition of type AiotDeviceProfileData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| aiotDevPermId | AiotDevPermId | M | 1 | Globally unique AIoT device permanent identifier |  |
| lastKnownAiotfInfo | LastKnownAiotfInfo | M | 1 | Last known AIOTF that serves the AIoT device, or unknown. |  |

#### 5.3.2.3 Type AiotDeviceProfileDataPatch

Table 5.3.2.3A-1: Definition of type AiotDeviceProfileDataPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| lastKnownAiotfInfo | LastKnownAiotfInfo | M | 1 | Last known AIOTF that serves the AIoT device, or unknown. |  |

### 5.3.3 Simple data types and enumerations

#### 5.3.3.1 Introduction

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

#### 5.3.3.2 Simple data types

The simple data types defined in table 5.4.3.2-1 shall be supported.

Table 5.4.3.2-1: Simple data types

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

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

## 5.4 Error handling

### 5.4.1 General

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

In addition, the requirements in the following clauses are applicable for the Nudr\_DataRepository service API for AIoT device profile data.

### 5.4.2 Protocol Errors

No specific procedures for the Nudr\_DataRepository service API for AIoT device profile data are specified.

### 5.4.3 Application Errors

The application errors defined for the Nudr\_DataRepository service API for AIoT device profile data are listed in table 5.5.3-1.

Table 5.4.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
| DATA\_NOT\_FOUND | 404 Not Found | The requested AIoT Device Profile Data is not found/does not exist. |

The application error handling shall follow 3GPP TS 29.504 [29504] clause 6.1.6 unless explicitly specified in this document.

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

## 5.5 Feature negotiation

The optional features in table 6.1.8-1 of 3GPP TS 29.504 [29504] are defined for the Nudr\_DataRepository API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

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

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

A.2 Nudr\_DataRepository API for AIoT device profile data

For the purpose of referencing entities in the Open API file defined in this Annex, it shall be assumed that this Open API file is contained in a physical file named "TS29506\_Aiot\_Device\_Profile\_Data.yaml".

openapi: 3.0.0

info:

 version: '-'

 title: Unified Data Repository Service API file for AIoT device profile data

 description: |

 The API version is defined in 3GPP TS 29.504

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externalDocs:

 description: >

 3GPP TS 29.506 V0.0.0; 5G System; Usage of the Unified Data Repository Service for AIoT Device

 AIoT Device Profile Data.

 url: 'https://www.3gpp.org/ftp/Specs/archive/29\_series/29.506/'

paths:

 /aiot-data/aiot-device-profile-data/{aiotDevPermId}:

 parameters:

 - name: aiotDevPermId

 in: path

 required: true

 schema:

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

 get:

 summary: Retrieves the AIoT device profile data for an AIoT device permanent identifier

 operationId: ReadAiotDeviceProfileData

 tags:

 - AiotDeviceProfileData (Document)

 security:

 - {}

 - oAuth2ClientCredentials:

 - nudr-dr

 - nudr-dr:aiot-data:aiot-device-profile-data

 - nudr-dr:aiot-data:aiot-device-profile-data:aiotDevPermId:read

 responses:

 '200':

 description: >

 Upon success, a response body containing AIoT device profile data shall be returned.

 content:

 application/json:

 schema:

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

 '400':

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

 '401':

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

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 description: Not Found

 content:

 application/problem+json:

 schema:

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

 '406':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/406'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

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

 '503':

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

 default:

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

 patch:

 summary: Modify the AIoT device profile data for an AIoT device permanent identifier.

 operationId: UpdateAiotDeviceProfileData

 tags:

 - AiotDeviceProfileData (Document)

 security:

 - {}

 - oAuth2ClientCredentials:

 - nudr-dr

 - nudr-dr:aiot-data:aiot-device-profile-data

 - nudr-dr:aiot-data:aiot-device-profile-data:aiotDevPermId:modify

 parameters:

 - name: supp-feat

 in: query

 description: Supported Features

 required: false

 schema:

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

 requestBody:

 required: true

 content:

 application/merge-patch+json:

 schema:

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

 responses:

 '200':

 description: Expected response to a valid request.

 content:

 application/json:

 schema:

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

 '204':

 description: No content. Response to successful modification.

 '400':

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

 '401':

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

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 description: Not Found

 content:

 application/problem+json:

 schema:

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

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

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

 '503':

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

 default:

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

components:

 schemas:

# STRUCTURED TYPES

 AiotDeviceProfileData:

 description: Contains the AIoT device profile data for a given AIoT device permanent id.

 type: object

 properties:

 aiotDevPermId:

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

 description: >

 Contains an AIoT device permanent identifier.

 lastKnownAiotfInfo:

 $ref: 'TS29369\_Nadm\_DM.yaml#/components/schemas/LastKnownAiotfInfo'

 description: >

 Contains Last known AIOTF that serves the AIoT device, or unknown.

 required:

 - aiotDevPermId

 - lastKnownAiotfInfo

 AiotDeviceProfileDataPatch:

 description: Contains the modifiable AIoT device profile data for a given AIoT device permanent Id.

 type: object

 properties:

 lastKnownAiotfInfo:

 $ref: 'TS29369\_Nadm\_DM.yaml#/components/schemas/LastKnownAiotfInfo'

 description: >

 Contains Last known AIOTF that serves the AIoT device, or unknown.

# ENUMS:

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