# ETSI TS 129 503 V16.7.0 (2021-04)



5G; 5G System; Unified Data Management Services; Stage 3 (3GPP TS 29.503 version 16.7.0 Release 16)



Reference
RTS/TSGC-0429503vg70

Keywords
5G

#### **ETSI**

650 Route des Lucioles F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

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## **Foreword**

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, modal verbs have the following meanings:

shall indicates a mandatory requirement to do somethingshall not indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

**should** indicates a recommendation to do something

**should not** indicates a recommendation not to do something

**may** indicates permission to do something

**need not** indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

can indicates that something is possiblecannot indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

will indicates that something is certain or expected to happen as a result of action taken by an agency

the behaviour of which is outside the scope of the present document

will not indicates that something is certain or expected not to happen as a result of action taken by an

agency the behaviour of which is outside the scope of the present document

might indicates a likelihood that something will happen as a result of action taken by some agency the

behaviour of which is outside the scope of the present document

might not indicates a likelihood that something will not happen as a result of action taken by some agency

the behaviour of which is outside the scope of the present document

In addition:

(or any other verb in the indicative mood) indicates a statement of fact

is not (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

## 1 Scope

The present document specifies the stage 3 protocol and data model for the Nudm Service Based Interface. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the UDM.

The 5G System stage 2 architecture and procedures are specified in 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3].

The Technical Realization of the Service Based Architecture and the Principles and Guidelines for Services Definition are specified in 3GPP TS 29.500 [4] and 3GPP TS 29.501 [5].

## 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]	3GPP TS 33.501: "Security Architecture and Procedures for 5G System".
[7]	3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces Stage 3".
[8]	3GPP TS 23.003: "Numbering, addressing and identification".
[9]	3GPP TS 29.504: "5G System; Unified Data Repository Services; Stage 3".
[10]	3GPP TS 29.505: "5G System; Usage of the Unified Data Repository Services for Subscription Data; Stage 3".
[11]	3GPP TS 32.255: "Charging management; 5G data connectivity domain charging".
[12]	3GPP TS 32.298: "Charging management; Charging Data Record (CDR) parameter description".
[13]	IETF RFC 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2)".
[14]	OpenAPI Initiative, "OpenAPI 3.0.0 Specification", <a href="https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md">https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md</a>
[15]	IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".
[16]	IETF RFC 7807: "Problem Details for HTTP APIs".
[17]	IETF RFC 7396: "JSON Merge Patch".
[18]	IETF RFC 6749: "The OAuth 2.0 Authorization Framework".
[19]	3GPP TS 29.510: "Network Function Repository Services; Stage 3".

[20]	3GPP TS 23.122: "Non-Access-Stratum (NAS) functions related to Mobile Station in idle mode".
[21]	3GPP TS 29.002: "Mobile Application Part (MAP) specification".
[22]	3GPP TS 29.338: "Diameter based protocols to support Short Message Service (SMS) capable Mobile Management Entities (MMEs)"
[23]	ITU-T Recommendation E.164: "The international public telecommunication numbering plan".
[24]	3GPP TS 29.509: "Authentication Server Services; Stage 3".
[25]	IETF RFC 7232: "Hypertext Transfer Protocol (HTTP/1.1): Conditional Requests".
[26]	IETF RFC 7234: "Hypertext Transfer Protocol (HTTP/1.1): Caching".
[27]	3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".
[28]	ETSI TS 102 225: "Smart Cards; Secured packet structure for UICC based applications".
[29]	IETF RFC 7542: "The Network Access Identifier".
[30]	3GPP TR 21.900: "Technical Specification Group working methods".
[31]	IETF RFC 3986: "Uniform Resource Identifier (URI): Generic Syntax".
[32]	3GPP TS 23.632: "User Data Interworking, Coexistence and Migration"
[33]	3GPP TS 29.519: "Policy Data, Application Data and Structured Data for Exposure; Stage 3".
[34]	3GPP TS 29.572: "5G System; Location Management Services; Stage 3".
[35]	3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".
[36]	3GPP TS 29.518: "Access and Mobility Management Services".
[37]	3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS); Stage 2".
[38]	3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".
[39]	3GPP TS 29.515: "5G System; Gateway Mobile Location Services; Stage 3".
[40]	3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".
[41]	IETF RFC 6902: "JavaScript Object Notation (JSON) Patch".
[42]	BBF TR-069: "CPE WAN Management Protocol".
[43]	BBF TR-369: "User Services Platform (USP)".
[44]	3GPP TS 29.524: "5G System; Cause codes mapping between 5GC interfaces; Stage 3".
[45]	3GPP TS 29.122: "T8 reference point for Northbound APIs".
[46]	3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".
[47]	3GPP TS 22.071: "Location Services (LCS); Service description; Stage 1".
[48]	3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".
[49]	3GPP TS 24.302: "Access to the 3GPP Evolved Packet Core (EPC) via non-3GPP access networks".
[50]	IETF RFC 7230: "Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing".

[51]	3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to support Vehicle-to-Everything (V2X) services".
[52]	3GPP TS 29.328: "IP Multimedia (IM) Subsystem Sh interface; Signalling flows and message contents".
[53]	3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".
[54]	3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 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].

5GC 5G Core Network

**ACS Auto-Configuration Server** 

**AMF** Access and Mobility Management Function

**AUSF Authentication Server Function NIDD** Non-IP Data Delivery

DNN Data Network Name **FQDN** Fully Qualified Domain Name

FN-RG Fixed Network RG

**GMLC** Gateway Mobile Location Centre **GPSI** Generic Public Subscription Identifier Globally Unique AMF Identifier **GUAMI** 

**HGMLC** Home GMLC

**JSON** Javascript Object Notation

LCS **LoCation Services** LCS Privacy Indicator LPI

**MICO** Mobile Initiated Connection Only

N5GC Non-5G-Capable

Network Access Identifier NAI Non-Access Stratum NAS

NEF **Network Exposure Function** NRF **Network Repository Function** 

**NSSAI Network Slice Selection Assistance Information** 

**NWDAF Network Data Analytics Function** PEI Permanent Equipment Identifier

**OFI** QoS Flow Identifier 5G-RG 5G Residential Gateway RG Residential Gateway SBI Service Based Interface **SMF** Session Management Function **SMSF Short Message Service Function SUCI** Subscription Concealed Identifier

SUPI	Subscription Permanent Identifier
UDM	Unified Data Management
UDR	Unified Data Repository
WACE	Windling Aggas Cotomor Function

W-AGF Wireline Access Gateway Function

## 4 Overview

## 4.1 Introduction

Within the 5GC, the UDM offers services to the AMF, SMF, SMSF, NEF, GMLC, NWDAF and AUSF via the Nudm service based interface (see 3GPP TS 23.501 [2], 3GPP TS 23.502 [3] and 3GPP TS 23.288 [35]).

Figure 4.1-1 provides the reference model (in service based interface representation and in reference point representation), with focus on the UDM.

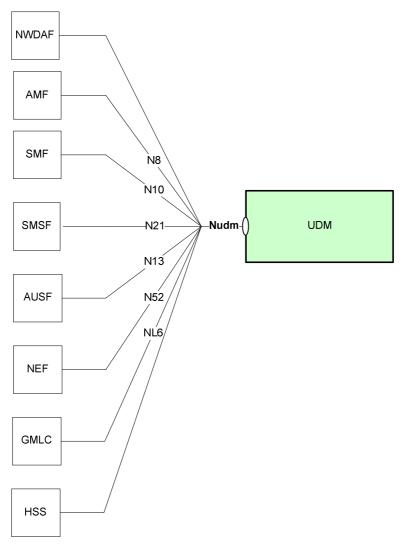


Figure 4.1-1: Reference model – UDM

The functionalities supported by the UDM are listed in clause 6.2.7 of 3GPP TS 23.501 [2].

## 5 Services offered by the UDM

## 5.1 Introduction

The UDM offeres the following services via the Nudm interface:

- Nudm\_SubscriberDataManagement Service
- Nudm\_UEContextManagement Service
- Nudm\_UEAuthentication Service
- Nudm\_EventExposure Service
- Nudm\_ParameterProvision Service
- Nudm\_NIDDAuthorization
- Nudm\_MT

Table 5.1-1 summarizes the corresponding APIs defined for this specification.

Table 5.1-1: API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	apiName	Annex
Nudm_SubscriberDataManagement	6.1	UDM Subscriber Data Managemen t Service	TS29503_Nudm_SDM.yaml	nudm- sdm	A.2
Nudm_UEContextManagement	6.2	UDM Context Managemen t Service	TS29503_Nudm_UECM.yaml	nudm- uecm	A.3
Nudm_UEAuthentication	6.3	UDM UE Authenticati on Service	TS29503_Nudm_UEAU.yaml	nudm- ueau	A.4
Nudm_EventExposure	6.4	UDM Event Exposure Service	TS29503_Nudm_EE.yaml	nudm-ee	A.5
Nudm_ParameterProvision	6.5	UDM Parameter Provision Service	TS29503_Nudm_PP.yaml	nudm-pp	A.6
Nudm_NIDDAuthorization	6.6	UDM NIDD Authorizatio n Service	TS29503_Nudm_NIDDAU.ya ml	nudm- niddau	A.7
Nudm_MT	6.7	UDM MT Service	TS29503_Nudm_MT.yaml	nudm-mt	A.8

All scenarios shown in the following clauses assume that the UDM is stateful and stores information in local memory. However, the UDM may be stateless and stores information externally in the UDR. If so, the stateless UDM makes use of Nudr services as specified in 3GPP TS 29.504 [9] and 3GPP TS 29.505 [10] to retrieve required data from the UDR and store them locally before processing an incoming request. Processing the incoming request may then include updating data in the UDR or subscribing to data change notifications at the UDR by consuming the appropriate Nudr services. After processing the incoming request, the UDM may delete the locally stored data. When data stored in UDR

is then shared among the different UDM instances of the same group, as identified by UDM Group ID (see 3GPP TS 23.501 [2], clause 6.2.6), bulk subscriptions, as described in clause 4.15.3.2.4 of 3GPP TS 23.502 [3], are not applicable, i.e. an NF consumer (e.g. NEF) only subscribes towards one of the UDM instances within the group. See Annex B.

## 5.2 Nudm\_SubscriberDataManagement Service

## 5.2.1 Service Description

See 3GPP TS 23.501 [2] table 7.2.5-1.

## 5.2.2 Service Operations

## 5.2.2.1 Introduction

For the Nudm\_SubscriberDataManagement service the following service operations are defined:

- Get
- Subscribe
- ModifySubscription
- Unsubscribe
- Notification
- Info

The Nudm\_SubscriberDataManagement Service is used by Consumer NFs (AMF, SMF, SMSF) to retrieve the UE's individual subscription data relevant to the consumer NF from the UDM by means of the Get service operation. If the consumer NF supports the feature "sharedData" (see clause 6.1.8), the retrieved individual subscription data for the UE may contain shared data identifier identifying additional parts of subscription data shared by several UEs. If so, the Nudm\_SubscriberDataManagement Service is also used by Consumer NFs to retrieve shared subscription data from the UDM by means of the Get service operation.

It is also used by Consumer NFs to subscribe to notifications of data change by means of the Subscribe service operation. If the consumer NF supports the feature "sharedData" (see clause 6.1.8), the consumer NF may also subscribe to notifications of shared data change by means of the Subscribe service operation.

It is also used to modify an existing subscription by means of the ModifySubscription service operation. If the consumer NF supports the feature "sharedData" (see clause 6.1.8), the consumer NF may also modify an existing subscription to notifications of shared data change by means of the ModifySubscription service operation.

It is also used to unsubscribe from notifications of data changes by means of the Unsubscribe service operation. If the feature "sharedData" (see clause 6.1.8) is supported, it may also be used to unsubscribe from notifications of shared data changes by means of the Unsubscribe service operation.

It is also used by the Consumer NFs (AMF, SMF, SMSF) that have previously subscribed, to get notified by means of the Notification service operation when UDM decides to modify the subscribed data. If the feature "sharedData" (see clause 6.1.8) is supported by the consumer NF and the consumer NF has previously subscribed to notifications of shared data change, it is also used by the consumer NF to get notified by means of the Notification service operation when the UDM decides to modify the subscribed shared data.

It is also used by Consumer NFs to provide the information about the status of the subscription data management procedures.

## 5.2.2.2 Get

#### 5.2.2.2.1 General

The following procedures using the Get service operation are supported:

- Slice Selection Subscription Data Retrieval
- Access and Mobility Subscription Data Retrieval
- SMF Selection Subscription Data Retrieval
- Session Management Subscription Data Retrieval
- SMS Subscription Data Retrieval
- SMS Management Subscription Data Retrieval
- UE Context in SMF Data Retrieval
- UE Context in SMSF Data Retrieval
- Retrieval Of Multiple Data Sets
- Identifier Translation
- Shared Subscription Data Retrieval
- Trace Data Retrieval
- LCS Privacy Data Retrieval
- LCS Mobile Originated Data Retrieval
- Enhanced Coverage Restriction Data Retrieval
- V2X Subscription Data Retrieval
- LCS Broadcast Assistance Subscription Data Retrieval
- UE Context in AMF Data Retrieval

When the feature SharedData (see clause 6.1.8) is supported and the retrieved UE-individual data (i.e. data other than Shared Subscription Data) contain SharedDataIds, the NF service consumer shall also retrieve the shared data identified by the received shared data Ids unless the identified shared data are already available at the NF service consumer. The order of sequence of sharedDataIds within UE-individual data is significant: Individual data take precedence over shared data; shared data "SharedDataX" identified by a sharedDataId X takes precedence over shared data "SharedDataY" identified by a sharedDataId Y if X appears before Y within the list of SharedDataIds in the UE-individual data.

### 5.2.2.2.2 Slice Selection Subscription Data Retrieval

Figure 5.2.2.2.2-1 shows a scenario where the NF service consumer (e.g. AMF) sends a request to the UDM to receive the UE's NSSAI (see also clause 5.15.5.2.1 of 3GPP TS 23.501 [2] and 3GPP TS 23.502 [3] figure 4.2.2.2.3-1 step 3). In this example scenario the NSSAI is retrieved by the AMF, see clause 6.1.3.2.1 for other scenarios that can retrieve the NSSAI. The request contains the UE's identity (/{supi}), the type of the requested information (/nssai) and query parameters (supported-features, plmn-id).

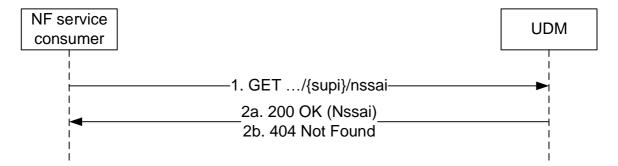


Figure 5.2.2.2-1: Requesting a UE's NSSAI

- 1. The NF service consumer (e.g. AMF) sends a GET request to the resource representing the UE's subscribed NSSAI, with query parameters indicating the supported-features and/or plmn-id.
- 2a. On success, the UDM responds with "200 OK" with the message body containing the UE's NSSAI as relevant for the requesting NF service consumer.
- 2b. If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

## 5.2.2.2.3 Access and Mobility Subscription Data Retrieval

Figure 5.2.2.2.3-1 shows a scenario where the NF service consumer (e.g. AMF) sends a request to the UDM to receive the UE's Access and Mobility Subscription data (see also 3GPP TS 23.502 [3] figure 4.2.2.2.2-1 step 14). The request contains the UE's identity (/{supi}), the type of the requested information (/am-data) and query parameters (supported-features, plmn-id).

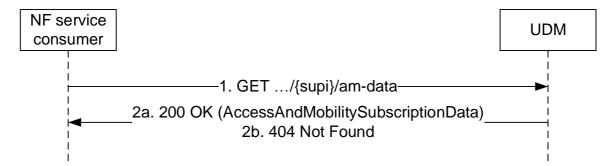


Figure 5.2.2.3-1: Requesting a UE's Access and Mobility Subscription Data

- 1. The NF service consumer (e.g. AMF) sends a GET request to the resource representing the UE's Access and Mobility Subscription Data, with query parameters indicating the supported-features and/or plmn-id.
- 2a. On Success, the UDM responds with "200 OK" with the message body containing the UE's Access and Mobility Subscription Data as relevant for the requesting NF service consumer.
- NOTE 1: If the UDM initiated a request to obtain SoR information from the SOR-AF, the UDM starts an operator configurable timer up to which the UDM shall wait for a response from the SOR-AF for retrieving the SoR information. The UDM responds back to the NF service consumer for Access and Mobility Subscription Data Retrieval service operation before the timer expires. If the SOR-AF has not provided a response with the SoR information before the timer expires, the UDM shall behave as specified in clause C.2 of 3GPP°TS°23.122 [20] (step 3d).2b.If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

NOTE 2: Upon reception of any Nudm\_EventExposure operation or Nudm\_PP operation, or when the validity of an event subscription or provisioned parameter with its associated maximum latency, maximum response time or DL Buffering Suggested Packet Count value expires, UDM may need to adjust the values of active time and/or periodic registration timer and/or DL Buffering Suggested Packet Count. The UDM shall notify AMF and/or SMF if the values are updated (see clause 4.15.3.2.3b and 4.15.6.3a of 3GPP TS 23.502 [3]).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

## 5.2.2.2.4 SMF Selection Subscription Data Retrieval

Figure 5.2.2.2.4-1 shows a scenario where the NF service consumer (e.g. AMF) sends a request to the UDM to receive the UE's SMF Selection Subscription data (see also 3GPP TS 23.502 [3] figure 4.2.2.2.2-1 step 14). The request contains the UE's identity (/{supi}), the type of the requested information (/smf-select-data) and query parameters (supported-features, plmn-id).



Figure 5.2.2.2.4-1: Requesting a UE's SMF Selection Subscription Data

- 1. The NF service consumer (e.g. AMF) sends a GET request to the resource representing the UE's SMF Selection Subscription Data, with query parameters indicating the supported-features and/or plmn-id.
- 2a. On success, the UDM responds with "200 OK" with the message body containing the UE's SMF Selection Subscription Data as relevant for the requesting NF service consumer.
- 2b. If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

### 5.2.2.2.5 Session Management Subscription Data Retrieval

Figure 5.2.2.2.5-1 shows a scenario where the NF service consumer (e.g. SMF) sends a request to the UDM to receive the UE's session management subscription data (see also 3GPP TS 23.502 [3] figure 4.3.2.2.1-1 step 4a-4b). The request contains the UE's identity (/{supi}), the type of the requested information (/sm-data), and query parameters (single-nssai, dnn, supported-features, plmn-id).



Figure 5.2.2.5-1: Requesting a UE's Session Management Subscription Data

- 1. The NF service consumer (e.g. SMF) sends a GET request to the resource representing the UE's session management subscription data, with query parameters indicating the selected network slice and/or the DNN and/or supported-features and/or plmn-id.
- 2a. On success, the UDM responds with "200 OK", the message body containing the UE's session management subscription data (an array of SessionManagementSubscriptionData objects, one array element per S-NSSAI) as relevant for the requesting NF service consumer.
- 2b. If there is no valid subscription data for the UE, or if the UE subscription data exists, but the requested session management subscription is not available (e.g. query parameter contains network slice and/or DNN that does not belong to the UE subscription), HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

## 5.2.2.2.6 SMS Subscription Data Retrieval

Figure 5.2.2.2.6-1 shows a scenario where the NF service consumer (e.g. AMF) sends a request to the UDM to receive the UE's SMS Subscription Data (see also 3GPP TS 23.502 [3], clause 4.13.3.1). The request contains the UE's identity (/{supi}) and the type of the requested information (/sms-data).

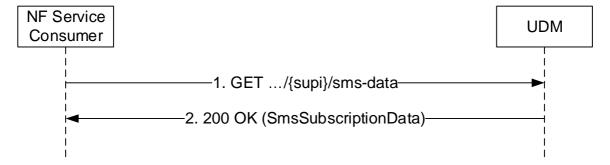


Figure 5.2.2.2.6-1: Requesting UE's SMS Subscription Data

- 1. The NF Service Consumer (e.g. AMF) sends a GET request to the resource representing the UE's SMS Subscription Data.
- 2. The UDM responds with "200 OK" with the message body containing the UE's SMS Subscription Data.

## 5.2.2.2.7 SMS Management Subscription Data Retrieval

Figure 5.2.2.2.7-1 shows a scenario where the NF service consumer (e.g. SMSF) sends a request to the UDM to receive the UE's SMS Management Subscription Data (see also 3GPP TS 23.502 [3], clause 4.13.3.1). The request contains the UE's identity (/{supi}) and the type of the requested information (/sms-mng-data).

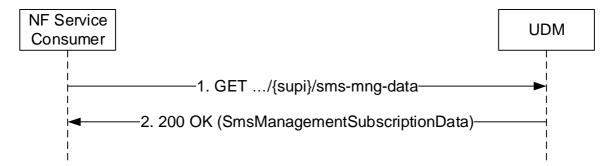


Figure 5.2.2.2.7-1: Requesting UE's SMS Management Subscription Data

- 1. The NF Service Consumer (e.g. SMSF) sends a GET request to the resource representing the UE's SMS Management Subscription Data.
- 2. The UDM responds with "200 OK" with the message body containing the UE's SMS Management Subscription Data.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

#### 5.2.2.2.8 UE Context In SMF Data Retrieval

Figure 5.2.2.2.8-1 shows a scenario where the NF service consumer (e.g. AMF) sends a request to the UDM to receive the UE's Context In SMF data (see also 3GPP TS 23.502 [3] figure 4.2.2.2.2-1 step 14). The request contains the UE's identity (/{supi}), the type of the requested information (/ue-context-in-smf-data) and query parameters (supported-features).

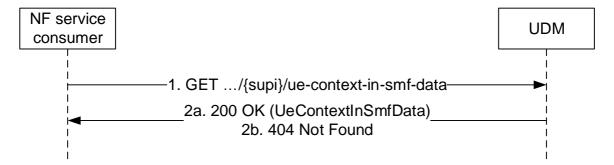


Figure 5.2.2.2.8-1: Requesting a UE's Context in SMF Data

- 1. The NF service consumer (e.g. AMF) shall send a GET request to the resource representing the UE's Context In SMF Data, with query parameters indicating the supported-features.
- 2a. On Success, the UDM shall respond with "200 OK" with the message body containing the UE's Context In SMF Data as relevant for the requesting NF service consumer.
- 2b. If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

### 5.2.2.2.9 Retrieval Of Multiple Data Sets

Figure 5.2.2.2.9-1 shows a scenario where the NF service consumer (e.g. AMF) sends a request to the UDM to receive multiple data sets. In this example scenario the UE's Access and Mobility Subscription data and the the UE's SMF Selection Subscription data are retrieved with a single request; see clause 6.1.3.11.3.1 for other data sets that can be retrieved with a single request. The request contains the UE's identity (/{supi}) and query parameters identifying the requested data sets (in this example: ?dataset-names=AM, SMF\_SEL).

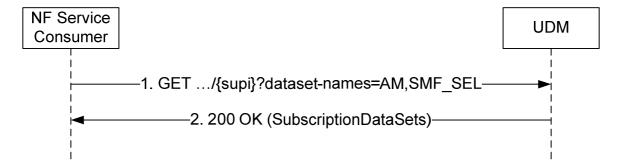


Figure 5.2.2.2.9-1: Retrieval of Multiple Data Sets

- 1. The NF Service Consumer (e.g. AMF) sends a GET request to the resource representing the supi. Query parameters indicate the requested data sets.
- 2. The UDM responds with "200 OK" with the message body containing the requested and available data sets. When not all requested data sets are available at the UDM (e.g. no Trace Data), only the requested and available data sets are returned in a "200 OK" response.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

## 5.2.2.2.10 Identifier Translation

Figure 5.2.2.2.10-1 shows a scenario where the NF service consumer (e.g. NEF) sends a request to the UDM to receive the SUPI/GPSI that corresponds to the provided GPSI/SUPI (see also 3GPP TS 23.502 [3], clause 4.13.2.2 and clause 4.13.7.2). The request contains the UE's identity ( $/\{ueId\}$ ) which shall be a SUPI or GPSI and the type of the requested information (/id-translation-result).

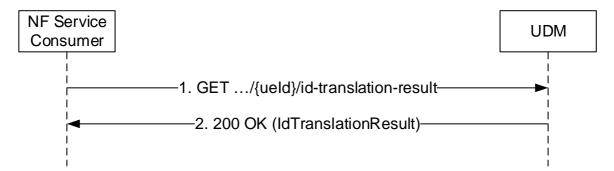


Figure 5.2.2.2.10-1: Identifier Translation

- 1. The NF Service Consumer (e.g. NEF) shall send a GET request to the resource representing the IdTranslationResult, with query parameters indicating the supported-features and/or app-port-id.
- 2. The UDM shall respond with "200 OK" with the message body containing the UE's SUPI.

## 5.2.2.2.11 Shared Subscription Data Retrieval

Figure 5.2.2.2.11-1 shows a scenario where the NF service consumer (e.g. AMF) sends a request to the UDM to receive the shared subscription data. The request contains the type of the requested information (/shared-data) and query parameters (supportedFeatures, shared-data-id).

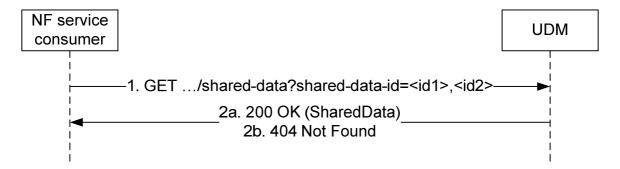


Figure 5.2.2.2.11-1: Requesting shared data

- 1. The NF service consumer (e.g. AMF) sends a GET request to the resource representing the SharedData, with query parameters indicating the supportedFeatures and shared-data-id.
- 2a. On success, the UDM responds with "200 OK" with the message body containing the SharedData.
- 2b. If there is no valid shared data for one or more of the shared-data-ids, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

#### 5.2.2.2.12 UE Context In SMSF Data Retrieval

Figure 5.2.2.2.12-1 shows a scenario where the NF service consumer (e.g. AMF) sends a request to the UDM to receive the UE's Context In SMSF data. The request contains the UE's identity (/{supi}), the type of the requested information (/ue-context-in-smsf-data) and query parameters (supported-features).

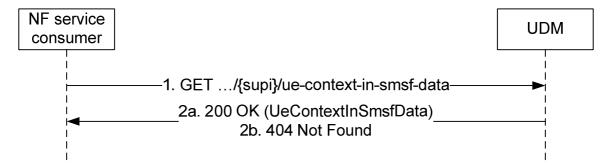


Figure 5.2.2.2.12-1: Requesting a UE's Context in SMSF Data

- 1. The NF service consumer (e.g. AMF) shall send a GET request to the resource representing the UE's Context In SMSF Data, with query parameters indicating the supported-features.
- 2a. On Success, the UDM shall respond with "200 OK" with the message body containing the UE's Context In SMSF Data as relevant for the requesting NF service consumer.
- 2b. If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

### 5.2.2.2.13 Trace data Retrieval

Figure 5.2.2.2.13-1 shows a scenario where the NF service consumer (e.g. AMF, SMF) sends a request to the UDM to receive the UE's trace data. The request contains the UE's identity (/{supi}), the type of the requested information (/trace-data) and query parameters.



Figure 5.2.2.2.13-1: Requesting a UE's trace Data

- 1. The NF service consumer (e.g. AMF, SMF) shall send a GET request to the resource representing the UE's trace Data, with query parameters.
- 2a. On Success, the UDM shall respond with "200 OK" with the message body containing the UE's trace data response as relevant for the requesting NF service consumer.
- 2b. If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

## 5.2.2.2.14 Group Identifier Translation

Figure 5.2.2.2.14-1 shows a scenario where the NF service consumer sends a request to the UDM to receive the Internal Group Identifier that corresponds to the provided External Group Identifier and / or the list of the UE identifiers (e.g. SUPIs, GPSIs) that belong to the provided External Group Identifier.

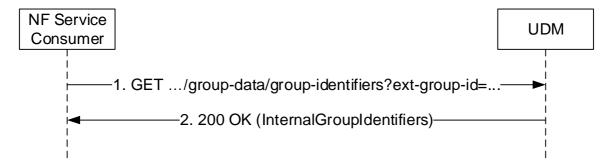


Figure 5.2.2.2.14-1: External Group Identifier Translation

- The NF Service Consumer (e.g. NEF, GMLC) shall send a GET request to the resource representing the group identifiers handled by UDM; the External Group Identifier is passed in a query parameter of the request URI, and an indication is also passed if the list of UE identifiers that belong to the provided External Group Identifier are required.
- 2. The UDM shall respond with "200 OK" with the message body containing the Internal Group Identifier and / or the list of UE identifiers that belong to the provided External Group Identifier.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

Figure 5.2.2.2.14-2 shows another scenario where the NF service consumer sends a request to the to receive the External Group Identifier that corresponds to the provided Internal Group Identifier and optionally, the list of the UE identifiers (e.g. SUPIs, GPSIs) pertaining to such group.

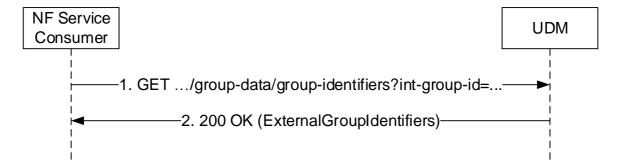


Figure 5.2.2.2.14-2: Internal Group Identifier Translation

- 1. The NF Service Consumer (e.g. NEF, GMLC) shall send a GET request to the resource representing the Internal Group Identifiers handled by UDM; the Internal Group Identifier is passed in a query parameter of the request URI, and an indication is also passed if the list of UE identifiers that belong to the provided Internal Group Identifier are required.
- 2. The UDM shall respond with "200 OK" with the message body containing the corresponding External Group Identifier and / or the list of UE identifiers that belong to the provided External Group Identifier.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

## 5.2.2.2.15 LCS Privacy Data Retrieval

Figure 5.2.2.2.15-1 shows a scenario where the NF service consumer (e.g. HGMLC, NEF) sends a request to the UDM to receive the UE's LCS Privacy Subscription data (see 3GPP TS 23.273 [38] figure 6.1.2-1 step 2, figure 6.3.1-1 step 2, figure 6.5.1-1 step 7 and figure 6.8.1 step 3). The request contains the UE's identity (/{ueId}), the type of the requested information (/lcs-privacy-data) and query parameters (supported-features).

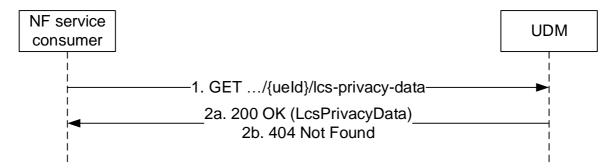


Figure 5.2.2.2.15-1: Requesting a UE's LCS Privacy Data

- 1. The NF service consumer (e.g. HGMLC, NEF) sends a GET request to the resource representing the UE's Lcs Privacy Subscription Data, with query parameters indicating the supported-features.
- 2a. On Success, the UDM responds with "200 OK" with the message body containing the UE's Lcs Privacy Subscription Data as relevant for the requesting NF service consumer.
- 2b. If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

## 5.2.2.2.16 LCS Mobile Originated Data Retrieval

Figure 5.2.2.2.16-1 shows a scenario where the NF service consumer (e.g. AMF) sends a request to the UDM to receive the UE's LCS Mobile Originated Subscription data (see 3GPP TS 23.502 [3] figure 4.2.2.2.2-1 step 14). The request contains the UE's identity (/{supi}), the type of the requested information (/lcs-mo-data) and query parameters (supported-features).

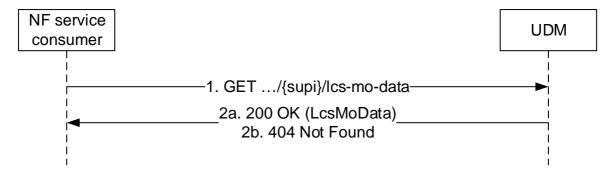


Figure 5.2.2.2.16-1: Requesting a UE's LCS Mobile Originated Data

- 1. The NF service consumer (e.g. AMF) sends a GET request to the resource representing the UE's LCS Mobile Originated Subscription Data, with query parameters indicating the supported-features.
- 2a. On Success, the UDM responds with "200 OK" with the message body containing the UE's LCS Mobile Originated Subscription Data as relevant for the requesting NF service consumer.
- 2b. If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

## 5.2.2.2.17 Enhanced Coverage Restriction Data Retrieval

Figure 5.2.2.2.17-1 shows a scenario where the NF service consumer (e.g. NEF) sends a request to the UDM to retrieve a UE's subscribed Enhanced Coverage Restriction data (see also 3GPP TS 23.502 [3] figure 4.27.1-1 step 3 and 7). The request contains the identifier of the UE (/{supi}), the type of the requested information (/am-data/ecr-data) and query parameters (supported-features).

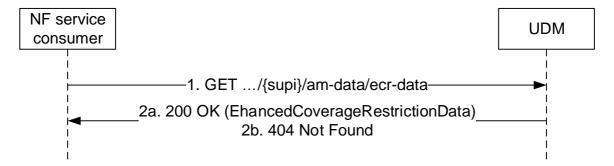


Figure 5.2.2.2.17-1: NF service consumer retrieves Enhance Coverage Restriction Data

- 1. The NF service consumer (e.g. NEF) sends a GET request to the resource that represents a UE's subscribed Enhanced Coverage Restriction data, with query parameters indicating the supported-features.
- 2a. On success, the UDM responds with "200 OK", the message body containing the UE's subscribed Enhanced Coverage Restriction data as relevant for the requesting NF service consumer.
- 2b. If there is no valid subscribed Enhanced Coverage Restriction data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

## 5.2.2.2.18 V2X Subscription Data Retrieval

Figure 5.2.2.2.18-1 shows a scenario where the NF service consumer (e.g. AMF) sends a request to the UDM to retrieve a UE's subscribed V2X data (see also 3GPP TS 23.287 [51] clause 6.5.2). The request contains the identifier of the UE (/{supi}), the type of the requested information (/v2x-data) and query parameters (supported-features).

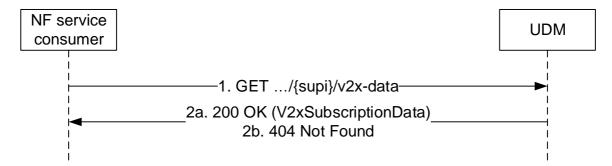


Figure 5.2.2.2.18-1: NF service consumer retrieves V2X Subscription Data

- 1. The NF service consumer (e.g. NEF) sends a GET request to the resource that represents a UE's subscribed V2X data, with query parameters indicating the supported-features and/or plmn-id.
- 2a. On success, the UDM responds with "200 OK", the message body containing the UE's subscribed V2X data as relevant for the requesting NF service consumer.
- 2b. If there is no valid subscribed V2X data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

### 5.2.2.2.19 LCS Broadcast Assistance Subscription Data Retrieval

Figure 5.2.2.2.19-1 shows a scenario where the NF service consumer (e.g. AMF) sends a request to the UDM to receive the UE's LCS Broadcast Assistance Subscription data (see 3GPP TS 23.273 [38]). The request contains the UE's identity (/{supi}), the type of the requested information (/lcs-bca-data) and query parameters (supported-features, plmn-id).

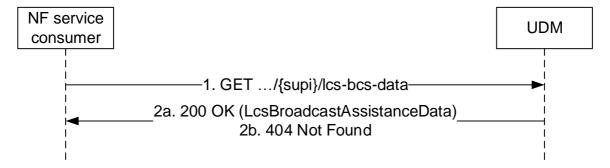


Figure 5.2.2.2.19-1: Requesting a UE's LCS Broadcast Assistance Subscription Data

- 1. The NF service consumer (e.g. AMF) sends a GET request to the resource representing the UE's Lcs Location Assistance Subscription Data, with query parameters indicating the supported-features and/or plmn-id.
- 2a. On Success, the UDM responds with "200 OK" with the message body containing the UE's Lcs Location Assistance Subscription Data as relevant for the requesting NF service consumer.
- 2b. If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

## 5.2.2.2.20 UE Context In AMF Data Retrieval

Figure 5.2.2.2.20-1 shows a scenario where the NF service consumer (e.g. HSS) sends a request to the UDM to receive the UE's Context In AMF data (see also 3GPP TS 23.632 [32] figure 5.3.4-1 step 2 and 3). The request contains the UE's identity (/{supi}), the type of the requested information (/ue-context-in-amf-data) and query parameters (supported-features).

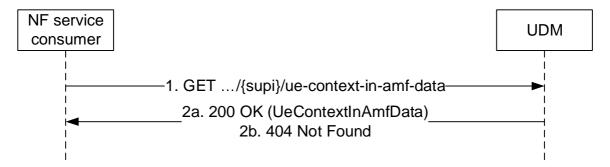


Figure 5.2.2.2.20-1: Requesting a UE's Context in AMF Data

- 1. The NF service consumer (e.g. HSS) shall send a GET request to the resource representing the UE's Context In AMF Data, with query parameters indicating the supported-features.
- 2a. On Success, the UDM shall respond with "200 OK" with the message body containing the UE's Context In AMF Data as relevant for the requesting NF service consumer.
- 2b. If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

#### 5.2.2.3 Subscribe

## 5.2.2.3.1 General

The following procedures using the Subscribe service operation are supported:

- Subscription to notification of data change (for UE individual data)
- Subscription to notification of shared data change

### 5.2.2.3.2 Subscription to notifications of data change

Figure 5.2.2.3.2-1 shows a scenario where the NF service consumer sends a request to the UDM to subscribe to notifications of data change (see also 3GPP TS 23.502 [3] figure 4.2.2.2.2-1 step 14). The request contains a callback URI and the URI of the monitored resource.

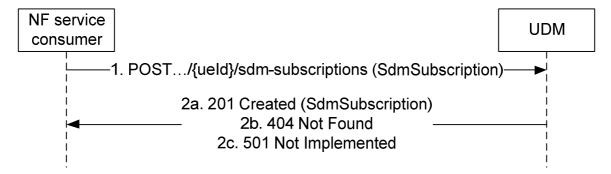


Figure 5.2.2.3.2-1: NF service consumer subscribes to notifications

- 1. The NF service consumer sends a POST request to the parent resource (collection of subscriptions) (.../{ueId}/sdm-subscriptions), to create a subscription as present in message body. The payload body of the POST request shall contain a representation of the individual subscription resource to be created. There shall be only one subscription per UE per NF service consumer identified by the ueId in URI and NfInstanceId in SdmSubscription.
- 2a. On success, the UDM responds with "201 Created" with the message body containing a representation of the created subscription. The Location HTTP header shall contain the URI of the created subscription.
- 2b. If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).
- 2c. If the UE subscription data exist, but the requested subscription to data change notification cannot be created (e.g. due to an invalid/unsupported data reference to be monitored, contained in the SdmSubscription parameter), HTTP status code "501 Not Implemented" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

# 5.2.2.3.3 Subscription to notifications of shared data change

Figure 5.2.2.3.3-1 shows a scenario where the NF service consumer sends a request to the UDM to subscribe to notifications of shared data change. The request contains a callback URI and the URI of the monitored resource.

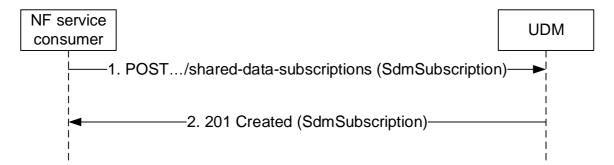


Figure 5.2.2.3.3-1: NF service consumer subscribes to notifications of shared data change

- 1. The NF service consumer sends a POST request to the parent resource (collection of subscriptions) (.../shared-data-subscriptions), to create a subscription as present in message body. The payload body of the POST request shall contain a representation of the shared data individual subscription resource to be created. There shall be only one shared data individual subscription per UE per NF service consumer identified by the ueId in URI and NfInstanceId in SdmSubscription.
- 2. On success, the UDM responds with "201 Created" with the message body containing a representation of the created subscription. The Location HTTP header shall contain the URI of the created subscription.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

## 5.2.2.4 Unsubscribe

#### 5.2.2.4.1 General

The following procedures using the Unsubscribe service operation are supported:

- Unsubscribe to notification of data change (for UE individual data)
- Unsubscribe to notifications of shared data change

# 5.2.2.4.2 Unsubscribe to notifications of data change

Figure 5.2.2.4.2-1 shows a scenario where the NF service consumer sends a request to the UDM to unsubscribe from notifications of data changes (see also 3GPP TS 23.502 [3] figure 4.2.2.2.2-1 step 14). The request contains the URI previously received in the Location HTTP header of the response to the subscription.

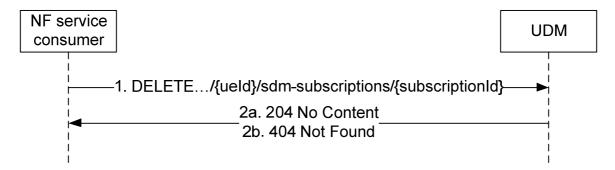


Figure 5.2.2.4.2-1: NF service consumer unsubscribes to notifications

- 1. The NF service consumer sends a DELETE request to the resource identified by the URI previously received during subscription creation.
- 2a. On success, the UDM responds with "204 No Content".
- 2b. If there is no valid subscription available (e.g. due to an unknown subscriptionId value), HTTP status code "404 Not Found" should be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the DELETE response body.

### 5.2.2.4.3 Unsubscribe to notifications of shared data change

Figure 5.2.2.4.3-1 shows a scenario where the NF service consumer sends a request to the UDM to unsubscribe from notifications of shared data changes. The request contains the URI previously received in the Location HTTP header of the response to the subscription.

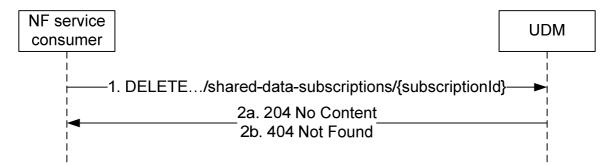


Figure 5.2.2.4.3-1: NF service consumer unsubscribes to notifications for shared data

- 1. The NF service consumer sends a DELETE request to the resource identified by the URI previously received during subscription creation.
- 2a. On success, the UDM responds with "204 No Content".
- 2b. If there is no valid subscription available (e.g. due to an unknown subscriptionId value), HTTP status code "404 Not Found" should be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the DELETE response body.

#### 5.2.2.5 Notification

#### 5.2.2.5.1 General

The following procedures using the Notification service operation are supported:

- Data change notification to NF, including the updates of UE's Subscriber Data indicated by the "subscription data Type" input and additional UE's UDM-related parameters.

## 5.2.2.5.2 Data Change Notification To NF

Figure 5.2.2.5.2-1 shows a scenario where the UDM notifies the NF service consumer (that has subscribed to receive such notification) about subscription data change (see also 3GPP TS 23.502 [3] clause 4.5.1 or 3GPP TS 23.502 [3] clause 4.5.2) or shared data change. The request contains the callbackReference URI as previously received in the SdmSubscription (see clause 6.1.6.2.3).

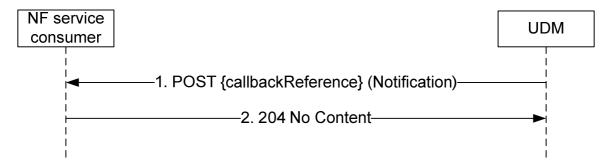


Figure 5.2.2.5.2-1: Subscription Data Change Notification

- 1. The UDM sends a POST request to the callbackReference as provided by the NF service consumer during the subscription.
- 2. The NF service consumer responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

Note: If the NF service consumer detects that the received Data Change Notification contains an origValue that does not match the currently stored value, it can re-sync by using the Nudm SDM Get service operation.

### 5.2.2.6 Info

#### 5.2.2.6.1 General

The following procedures using the Info service operation are supported:

- Providing acknowledgement from the UE to UDM about successful delivery of Steering of Roaming information via the AMF as defined in 3GPP TS 23.122 [20]
- Providing acknowledgement from the UE to UDM about successful delivery of updated Default Configured NSSAI or UICC data (Secured-Packet, containing e.g. Routing indicator) via the AMF as defined in 3GPP TS 23.502 [3].
- Providing acknowledgement from the UE to the UDM about successful delivery of the Network Slicing Subscription Change Indication.
- Providing acknowledgement from the UE to UDM about successful delivery of CAG configuration (see 3GPP TS 23.501 [2] clause 5.30.3.3).

- Triggering update of Steering of Roaming information at the UE due to "initial registration" or "emergency registration" in a VPLMN.

## 5.2.2.6.2 Providing acknowledgement of Steering of Roaming

Figure 5.2.2.6.2-1 shows a scenario where the NF service consumer (e.g. AMF) sends the UE acknowledgement to the UDM (see also 3GPP TS 23.122 [20] Annex C). The request contains the UE's identity (/{supi}), the type of the acknowledgement information (/am-data/sor-ack), and the SOR-MAC-Iue.

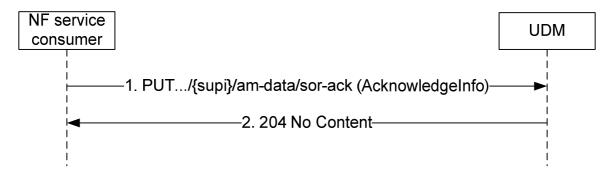


Figure 5.2.2.6.2-1: Providing acknowledgement of Steering of Roaming

- 1. The NF service consumer (e.g. AMF) sends a PUT request to the resource representing the UE's Access and Mobility Subscription Data, with the AcknowledgeInfo (SOR-MAC-Iue) received from the UE.
- 2. The UDM responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PUT response body.

## 5.2.2.6.3 Providing acknowledgement of UE parameters update

Figure 5.2.2.6.3-1 shows a scenario where the NF service consumer (e.g. AMF) sends the UE acknowledgement to the UDM (see also 3GPP TS 23.502 [3]). The request contains the UE's identity ( $/\{supi\}$ ), the type of the acknowledgement information (/am-data/upu-ack), and the UPU-MAC-Iue.

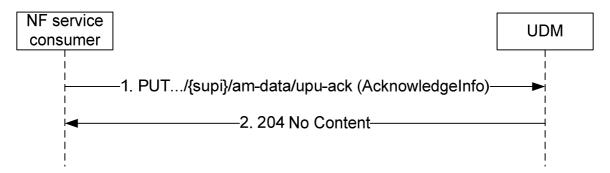


Figure 5.2.2.6.3-1: Providing acknowledgement of UE parameters update

- 1. The NF service consumer (e.g. AMF) sends a PUT request to the resource representing the UE's Access and Mobility Subscription Data, with the AcknowledgeInfo(UPU-MAC-I<sub>UE</sub>) received from the UE.
- 2. The UDM responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PUT response body.

## 5.2.2.6.4 Providing acknowledgement of UE for Network Slicing Subscription Change

Figure 5.2.2.6.4-1 shows a scenario where the NF service consumer (e.g. AMF) sends the UE acknowledgement to the UDM (see also 3GPP TS 23.502 [3]). The request contains the UE's identity (/{supi}) and the type of the acknowledgement information (/am-data/subscribed-snssais-ack).

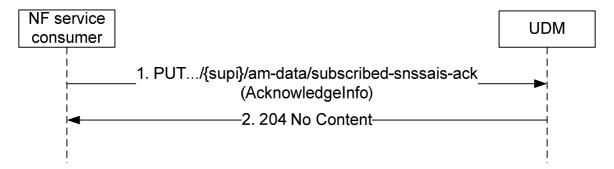


Figure 5.2.2.6.4-1: Providing acknowledgement of UE for Network Slicing Subscription Change

- 1. The NF service consumer (e.g. AMF) sends a PUT request to the resource representing the UE's Access and Mobility Subscription Data, with the AcknowledgeInfo.
- 2. The UDM responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PUT response body.

## 5.2.2.6.5 Providing acknowledgement of UE for CAG configuration change

Figure 5.2.2.6.5-1 shows a scenario where the NF service consumer (e.g. AMF) sends the UE acknowledgement to the UDM (see also 3GPP TS 23.502 [3]). The request contains the UE's identity (/{supi}) and the type of the acknowledgement information (/am-data/cag-ack).

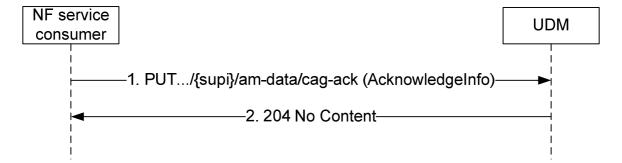


Figure 5.2.2.6.5-1: Providing acknowledgement of UE for CAG configuration change

- 1. The NF service consumer (e.g. AMF) sends a PUT request to the resource representing the UE's Access and Mobility Subscription Data, with the AcknowledgeInfo.
- 2. The UDM responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PUT response body.

# 5.2.2.6.6 Triggering Update of Steering Of Roaming information

Figure 5.2.2.6.6-1 shows a scenario where the NF service consumer (e.g. AMF) sends the request to the UDM to trigger the update of Steering of Roaming information at the UE. The request contains the UE's identity ( $/\{supi\}$ ), the type of request (/am-data/update-sor) and the VPLMN ID.

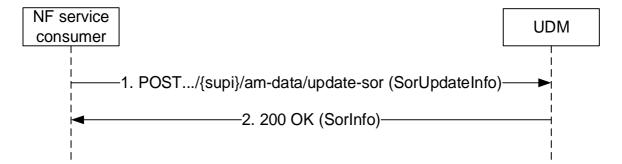


Figure 5.2.2.6.6-1: Triggering update of Steering Of Roaming information

- 1. The NF service consumer (e.g. AMF) sends a POST request to the resource representing the UE's Access and Mobility Subscription Data, with the request to update the Steering of Roaming information at the UE.
- 2. The UDM responds with "200 OK" containing the updated Sor Information.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

# 5.2.2.7 ModifySubscription

#### 5.2.2.7.1 General

The following procedures using the ModifySubscription service operation are supported:

- Modification of a Subscription to notification of data change (for UE individual data)
- Modification of a Subscription to notification of shared data change

The ModifySubscription service operation can be used for the following purpose:

- Extend the expiry time of SdmSubscription;
- Modify the resource URIs to be monitored, e.g. add/remove resource URIs to/from the monitored resource URI list.

### 5.2.2.7.2 Modification of a subscription to notifications of data change

Figure 5.2.2.7.2-1 shows a scenario where the NF service consumer sends a request to the UDM to modify a subscription to notifications of data changes. The request contains the URI previously received in the Location HTTP header of the response to the subscription.

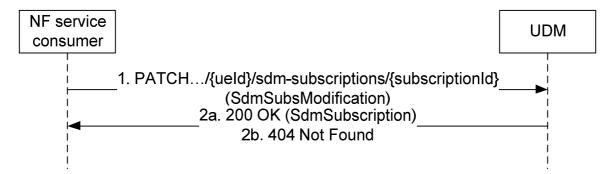


Figure 5.2.2.7.2-1: NF service consumer modifies a subscription to notifications

1. The NF service consumer sends a PATCH request to the resource identified by the URI previously received during subscription creation.

The NF service consumer may include "monitoredResourceUris" to replace the existing monitored resource URIs, e.g. to add/remove specific resource URIs from the monitored resource URI list.

- 2a. On success, the UDM responds with "200 OK".
- 2b. If there is no valid subscription available (e.g. due to an unknown subscriptionId value), HTTP status code "404 Not Found" should be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PATCH response body.

## 5.2.2.7.3 Modification of a subscription to notifications of shared data change

Figure 5.2.2.7.3-1 shows a scenario where the NF service consumer sends a request to the UDM to modifya subscription to notifications of shared data changes. The request contains the URI previously received in the Location HTTP header of the response to the subscription.



Figure 5.2.2.7.3-1: NF service consumer modifies a subscription to notifications for shared data

1. The NF service consumer sends a PATCH request to the resource identified by the URI previously received during subscription creation.

The NF service consumer may include "monitoredResourceUris" to replace the existing monitored resource URIs, e.g. for the purposes to add/remove specific resource URIs from the monitored resource URI list.

- 2a. On success, the UDM responds with "200 OK".
- 2b. If there is no valid subscription available (e.g. due to an unknown subscriptionId value), HTTP status code "404 Not Found" should be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PATCH response body.

# 5.3 Nudm\_UEContextManagement Service

# 5.3.1 Service Description

See 3GPP TS 23.501 [2] table 7.2.5-1, and 3GPP TS 23.632 [32].

# 5.3.2 Service Operations

## 5.3.2.1 Introduction

For the Nudm\_UEContextManagement service the following service operations are defined:

- Registration
- DeregistrationNotification

- Deregistration
- Get
- Update
- P-CSCF-RestorationNotification
- P-CSCF-RestorationTrigger
- AMFDeregistration
- PEI-Update

The Nudm\_UEContextManagement Service is used by Consumer NFs (AMF, SMF, SMSF) to register at the UDM by means of the Registration service operation.

It is also used by the registered Consumer NFs (AMF) to get notified by means of the DeregistrationNotification service operation when UDM decides to deregister the registered consumer NF.

It is also used by the registered Consumer NFs (AMF, SMF, SMSF) to deregister from the UDM by means of the Deregistration service operation.

It is also used by consumer NFs (NEF, NWDAF, NSSAAF) to retrieve registration information from the UDM by means of the Get service operation.

It is also used by the registered Consumer NFs (AMF, SMF) to update registration information stored at the UDM by means of the Update service operation.

It is also used by the registered Consumer NFs (AMF, SMF) to get notified by means of the P-CSCF-RestorationNotification service operation when UDM detects the need for P-CSCF restoration.

It is also used by the consumer NF (HSS) to trigger P-CSCF restoration by means of the P-CSCF-RestorationTrigger service operation.

It is also used by the consumer NF (HSS) to trigger deregistration of the registered AMF for 3GPP access by means of the AMFDeregistration service operation

It is also used by the consumer NF (HSS) to update the PEI in the AMF 3GPP Access Registration context, by means of the PEI-Update service operation.

## 5.3.2.2 Registration

#### 5.3.2.2.1 General

The Registration service operation is invoked by a NF that has been selected to provide service to the UE to store related UE Context Management information in UDM.

NF Consumers are AMF for access and mobility management service, SMF for session management services, SMSF providing SMS services and HSS for IP-SM-GW registration in SMSoIP scenarios.

As part of this registration procedure, the UDM authorizes or rejects the subscriber to use the service provided by the registered NF, based on subscription data (e.g. roaming restrictions).

The following procedures using the Registration service operation are supported:

- AMF registration for 3GPP access
- AMF registration for non-3GPP access
- SMF registration
- SMSF registration for 3GPP access
- SMSF registration for non-3GPP access

- IP-SM-GW registration

## 5.3.2.2.2 AMF registration for 3GPP access

Figure 5.3.2.2.2-1 shows a scenario where the AMF sends a request to the UDM to update the AMF registration information for 3GPP access (see also 3GPP TS 23.502 [3] figure 4.2.2.2.2-1 step 14). The request contains the UE's identity (/{ueId}) which shall be a SUPI and the AMF Registration Information for 3GPP access.



Figure 5.3.2.2.2-1: AMF registering for 3GPP access

1. The AMF sends a PUT request to the resource representing the UE's AMF registration for 3GPP access to update or create AMF registration information.

If EPS interworking with N26 is supported, and the AMF has per DNN selected the PGW-C+SMF for EPS interworking, the AMF shall include the info of selected PGW-C+SMF to the UDM.

2a. On success, the UDM updates the Amf3GppAccessRegistration resource by replacing it with the received resource information, and responds with "200 OK" or "204 No Content".

UDM shall invoke the Deregistration Notification service operation towards the old AMF using the callback URI provided by the old AMF.

When AMF indicates there are no ongoing event subscriptions, but UDM has ongoing event exposure subscriptions stored (e.g. in UDR), UDM shall invoke one Namf\_EventExposure Subscribe Service operations (see clause 5.3.2.2 of 3GPP TS 29.518 [36]) on behalf of NEF per subscription stored.

- 2b. If the resource does not exist (there is no previous AMF information stored in UDM for that user), UDM stores the received AMF registration data for 3GPP access and responds with HTTP Status Code "201 created". A response body may be included to convey additional information to the NF consumer (e.g., features supported by UDM).
- 2c. If the operation cannot be authorized due to e.g UE does not have required subcription data, the AMF does not support CAG feature and the UE is allowed to access 5GS via CAG cell(s) only, access barring, roaming restrictions or core network restriction, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PUT response body.

## 5.3.2.2.3 AMF registration for non 3GPP access

Figure 5.3.2.2.3-1 shows a scenario where the AMF sends a request to the UDM to update the AMF registration information for non 3GPP access (see also 3GPP TS 23.502 [3] figure 4.2.2.2.2-1 step 14). The request contains the UE's identity (/{ueId}) which shall be a SUPI and the AMF Registration Information for non 3GPP access.



Figure 5.3.2.2.3-1: AMF registering for non 3GPP access

- 1. The AMF sends a PUT request to the resource representing the UE's AMF registration for non 3GPP access to update or create AMF registration information.
- 2a. On success, the UDM updates the AmfNon3GppAccessRegistration resource by replacing it with the received resource information, and responds with "200 OK" or "204 No Content".

UDM shall invoke the Deregistration Notification service operation towards the old AMF using the callback URI provided by the old AMF.

When AMF indicates there are no ongoing event subscriptions, but UDM has ongoing event exposure subscriptions stored (e.g. in UDR), UDM shall invoke one Namf\_EventExposure Subscribe Service operations (see clause 5.3.2.2 of 3GPP TS 29.518 [36]) on behalf of NEF per subscription stored.

- 2b. If the resource does not exist (there is no previous AMF information stored in UDM for that user), UDM stores the received AMF registration data for non-3GPP access and responds with HTTP Status Code "201 created". A response body may be included to convey additional information to the NF consumer (e.g., features supported by UDM).
- 2c. If the operation cannot be authorized due to e.g UE does not have required subcription data, the AMF does not support CAG feature and the UE is allowed to access 5GS via CAG cell(s) only, access barring, roaming restrictions or core network restriction, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PUT response body.

### 5.3.2.2.4 SMF registration

Figure 5.3.2.2.4-1 shows a scenario where an SMF sends a request to the UDM to create a new registration (see also 3GPP TS 23.502 [3] figure 4.3.2.2.1-1 step 4). The request contains the UE's identity ( $/\{ueId\}$ ) which shall be a SUPI and the SMF Registration Information.



Figure 5.3.2.2.4-1: SMF registration

1. The SMF sends a PUT request to the resource .../{ueId}/registrations/smf-registrations/{pduSessionId}, to create an SMF Registration as present in the message body.

If the SMF belongs to an SMF Set, the NF Set ID of the SMF Set shall be included in the request message.

- 2a. The UDM responds with "201 Created" with the message body containing a representation of the created SMF registration.
  - If the new SMF is not in the same SMF Set as the old SMF, the UDM shall invoke the Deregistration Notification service operation towards the old SMF using the callback URI provided by the old SMF.
- 2b. If the operation cannot be authorized due to e.g UE does not have required subcription data, access barring or roaming restrictions, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PUT response body.

## 5.3.2.2.5 SMSF Registration for 3GPP Access

Figure 5.3.2.2.5-1 shows a scenario where the SMSF sends a request to the UDM to create or update the SMSF registration information for 3GPP access (see also 3GPP TS 23.502 [3], clause 4.13.3.1). The request contains the UE's identity (/{ueId}) which shall be a SUPI and the SMSF Registration Information for SMS service.

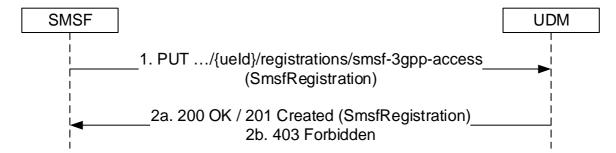


Figure 5.3.2.2.5-1: SMSF registering for 3GPP Access

- 1. The SMSF sends a PUT request to the resource representing the UE's SMSF registration for 3GPP Access to update or create SMSF registration information.
  - If the SMSF belongs to an SMSF Set, the NF Set ID of the SMSF Set shall be included in the request message.
- 2a. If successful, the UDM responds with "200 OK", or "201 Created" with the message body containing the representation of the SmsfRegistration.
- 2b. If the operation cannot be authorized due to e.g UE does not have required subcription data, access barring or roaming restrictions, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PUT response body.

## 5.3.2.2.6 SMSF Registration for Non 3GPP Access

Figure 5.3.2.2.6-1 shows a scenario where the SMSF sends a request to the UDM to create or update the SMSF registration information for non 3GPP access (see also 3GPP TS 23.502 [3], clause 4.13.3.1). The request contains the UE's identity (/{ueId}) which shall be a SUPI and the SMSF Registration Information for SMS service.



Figure 5.3.2.2.6-1: SMSF registering for Non 3GPP Access

1. The SMSF sends a PUT request to the resource representing the UE's SMSF registration for Non 3GPP Access to update or create SMSF registration information.

If the SMSF belongs to an SMSF Set, the NF Set ID of the SMSF Set shall be included in the request message.

- 2a. If successful, the UDM responds with "200 OK", or "201 Created" with the message body containing the representation of the SmsfRegistration.
- 2b. If the operation cannot be authorized due to e.g UE does not have required subcription data, access barring or roaming restrictions, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PUT response body.

# 5.3.2.2.7 IP-SM-GW registration

Figure 5.3.2.2.7-1 shows a scenario where an HSS sends a request to the UDM to create a new registration of an IP-SM-GW (see also 3GPP TS 23.632 [32] figure 5.5.X.2.1-1 step 2). The request contains the UE's identity (/{ueId}) which shall be a SUPI and the IP-SM-GW registration information.



Figure 5.3.2.2.7-1: IP-SM-GW registration

- 1. The HSS sends a PUT request to the resource .../{ueId}/registrations/ip-sm-gw, to create an IP-SM-GW registration as present in the message body.
- 2a. If there was not a prior registration, the UDM responds with "201 Created" with the message body containing a representation of the created IP-SM-GW registration.
- 2b. If there was a prior registration, the UDM responds with "200 OK" with the message body containing a representation of the updated IP-SM-GW registration.
- 2c. If the operation cannot be authorized due to e.g UE does not have required subcription data, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PUT response body.

# 5.3.2.3 DeregistrationNotification

#### 5.3.2.3.1 General

The following procedure using the DeregistrationNotification service operation is supported:

- UDM initiated NF Deregistration

# 5.3.2.3.2 UDM initiated NF Deregistration

Figure 5.3.2.3.2-1 shows a scenario where the UDM notifies the registered NF about its deregistration (see also 3GPP TS 23.502 [3] figure 4.2.2.2.2-1 step 14 and 3GPP TS 23.502 [3] figure 4.2.6.4.1.1-1 step 14). The request contains the callback URI for deregistration notification as received by the UDM during registration, and Deregistration Data.

The UDM initiates the deregistration procedure when the UE is registered to the AMF which does not support CAG feature and the CAG subscription of the UE changes and it is allowed to access the 5GS via CAG cell(s) only.

The UDM also initiates deregistration notification when UE moves to different AMF within same AMF-Set.

Deregistration notification shall not be sent if the nfInstanceId of the AMF initiating registration is same as the old AMF already registered in UDM (e.g. when multiple PLMNs are hosted on same AMF and UE moves across PLMNs).

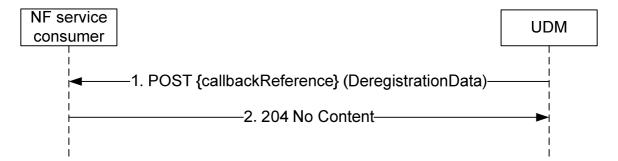


Figure 5.3.2.3.2-1: UDM initiated NF Deregistration

- 1. The UDM sends a POST request to the callbackReference as provided by the NF service consumer during the registration.
- 2. The NF service consumer responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

## 5.3.2.4 Deregistration

## 5.3.2.4.1 General

The following procedures using the Deregistration service operation are supported:

- AMF deregistration for 3GPP access
- AMF deregistration for non-3GPP access
- SMF deregistration
- SMSF deregistration for 3GPP access
- SMSF deregistration for non-3GPP access
- IP-SM-GW deregistration

## 5.3.2.4.2 AMF deregistration for 3GPP access

Figure 5.3.2.4.2-1 shows a scenario where the AMF sends a request to the UDM to deregister (purge) from the UDM for 3GPP access (see also 3GPP TS 23.502 [3] figure 4.5.3.1-1 step 3). The request contains the UE's identity (/{ueId}) which shall be a SUPI and an instruction to set the purgeFlag within the Amf3GppAccessRegistration resource.

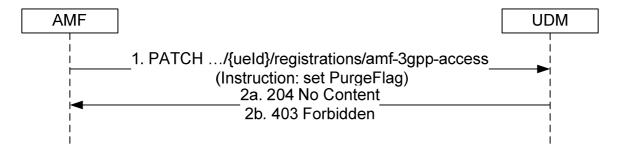


Figure 5.3.2.4.2-1: AMF deregistering for 3GPP access

- 1. The AMF sends a PATCH request to the resource representing the UE's AMF registration for 3GPP access.
- 2a. The UDM shall check whether the received GUAMI matches the stored GUAMI. If so, the UDM shall set the PurgeFlag. The UDM responds with "204 No Content".
- 2b. Otherwise the UDM responds with "403 Forbidden".

NOTE: Based on operator policy, when AMF receives 403 Forbidden, the AMF can avoid freezing the 5G-TMSI that the UE used, under consideration that the UE has been assigned another 5G-TMSI by another AMF.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PATCH response body.

## 5.3.2.4.3 AMF deregistration for non-3GPP access

Figure 5.3.2.4.3-1 shows a scenario where the AMF sends a request to the UDM to deregister (purge) from the UDM for non-3GPP access (see also 3GPP TS 23.502 [3] figure 4.5.3.1-1 step 3). The request contains the UE's identity (/{ueId}) which shall be a SUPI and an instruction to set the purgeFlag within the AmfNon3GppAccessRegistration resource.

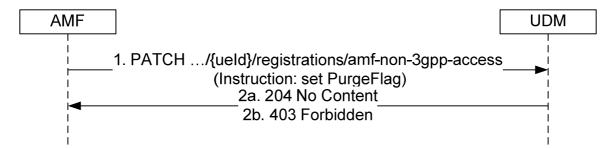


Figure 5.3.2.4.3-1: AMF deregistering for non-3GPP access

- 1. The AMF sends a PATCH request to the resource representing the UE's AMF registration for non-3GPP access.
- 2a. The UDM shall check whether the received GUAMI matches the stored GUAMI. If so, the UDM shall set the PurgeFlag. The UDM responds with "204 No Content".
- 2b. Otherwise the UDM responds with "403 Forbidden".

NOTE: Based on operator policy, when AMF receives 403 Forbidden, the AMF can avoid freezing the 5G-TMSI that the UE used, under consideration that the UE has been assigned another 5G-TMSI by another AMF.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PATCH response body.

# 5.3.2.4.4 SMF deregistration

Figure 5.3.2.4.4-1 shows a scenario where the SMF sends a request to the UDM to deregister an individual SMF registration (see also 3GPP TS 23.502 [3] figure 4.3.2.2-1 step 20). The request contains the UE's identity (/{ueId}) which shall be a SUPI and the PDU Session ID (/{pduSessionId}).



Figure 5.3.2.4.4-1: SMF deregistration

- 1. The SMF sends a DELETE request to the resource representing the individual SMF registration that is to be deregistered.
- 2. The UDM responds with "204 No Content". If the SMF had requested the SDM Subscription to be created with the "implicitUnsubscribe" flag set, then UDM will terminate the SDM Subscription when the last PDU Session for that SUPI and SMF is deregistered.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the DELETE response body.

## 5.3.2.4.5 SMSF Deregistration for 3GPP Access

Figure 5.3.2.4.5-1 shows a scenario where the SMSF sends a request to the UDM to delete the SMSF registration information for 3GPP access (see also 3GPP TS 23.502 [3], clause 4.13.3.2). The request contains the UE's identity (/{ueId}) which shall be a SUPI.

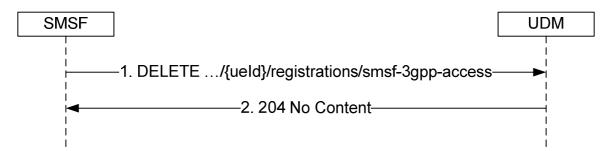


Figure 5.3.2.4.5-1: SMSF Deregistering for 3GPP Access

- 1. The SMSF sends a DELETE request to the resource representing the UE's SMSF registration for 3GPP access.
- 2. If successful, the UDM responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the DELETE response body.

# 5.3.2.4.6 SMSF Deregistration for Non 3GPP Access

Figure 5.3.2.4.6-1 shows a scenario where the SMSF sends a request to the UDM to delete the SMSF registration information for non 3GPP access (see also 3GPP TS 23.502 [3], clause 4.13.3.2). The request contains the UE's identity (/{ueId}) which shall be a SUPI.

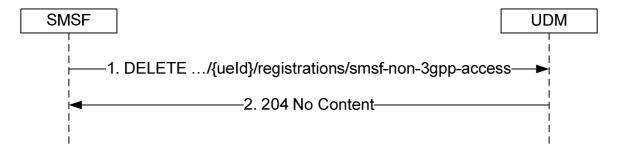


Figure 5.3.2.4.6-1: SMSF Deregistering for Non 3GPP Access

- 1. The SMSF sends a DELETE request to the resource representing the UE's SMSF registration for non 3GPP access.
- 2. If successful, the UDM responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the DELETE response body.

# 5.3.2.4.7 IP-SM-GW deregistration

Figure 5.3.2.4.7-1 shows a scenario where the HSS sends a request to the UDM to deregister the IP-SM-GW from the UDM (see also 3GPP TS 23.632 [32] figure 5.5.X.2-2 step 2). The request contains the UE's identity ( $/\{ueId\}$ ) which shall be a SUPI.



Figure 5.3.2.4.7-1: IP-SM-GW deregistration

- 1. The HSS sends a DELETE request to the resource representing the UE's IP-SM-GW registration.
- 2. The UDM responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the DELETE response body.

#### 5.3.2.5 Get

# 5.3.2.5.1 General

The following procedures using the Get service operation are supported:

- Amf3GppAccessRegistration Information Retrieval

- AmfNon3GppAccessRegistration Information Retrieval
- SmfRegistrations Information Retrieval
- SmsfRegistration Information Retrieval for 3GPP Access
- SmsfRegistration Information Retrieval for Non-3GPP Access
- Location Information Retrieval
- Retrieval Of Multiple UE Registration Data Sets
- IP-SM-GW Registration Information Retrieval

## 5.3.2.5.2 Amf3GppAccessRegistration Information Retrieval

Figure 5.3.2.5.2-1 shows a scenario where the NF service consumer (e.g. NEF) sends a request to the UDM to retrieve the UE's Amf3GppAccessRegistration Information. The request contains the UE's identity (/{ueId}) which shall be a GPSI or SUPI, the type of the requested information (/registrations/amf-3gpp-access) and query parameters (supported-features).



Figure 5.3.2.5.2-1: Requesting a UE's AMF Registration Information for 3GPP Access

- 1. The NF service consumer (e.g. NEF) sends a GET request to the resource representing the UE's AMF registration information for 3GPP access, with query parameters indicating the supported-features.
- 2. The UDM responds with "200 OK" with the message body containing the UE's Amf3GppAccessRegistration.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

### 5.3.2.5.3 AmfNon3GppAccessRegistration Information Retrieval

Figure 5.3.2.5.3-1 shows a scenario where the NF service consumer (e.g. NEF) sends a request to the UDM to retrieve the UE's AmfNon3GppAccessRegistration Information. The request contains the UE's identity (/{ueId}) which shall be a GPSI or SUPI, the type of the requested information (/registrations/amf-non-3gpp-access) and query parameters (supported-features).



Figure 5.3.2.5.3-1: Requesting a UE's AMF Registration Information for non-3GPP Access

- 1. The NF service consumer (e.g. NEF) sends a GET request to the resource representing the UE's AMF registration information for non-3GPP access, with query parameters indicating the supported-features.
- 2. The UDM responds with "200 OK" with the message body containing the UE's AmfNon3GppAccessRegistration.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

#### 5.3.2.5.4 Void

## 5.3.2.5.5 SmsfRegistration Information Retrieval for 3GPP Access

Figure 5.3.2.5.5-1 shows a scenario where the NF service consumer (e.g. NEF) sends a request to the UDM to retrieve the UE's SmsfRegistration Information. The request contains the UE's identity (/{ueId}) which shall be a GPSI, the type of the requested information (/registrations/smsf-3gpp-access) and query parameters (supported-features).

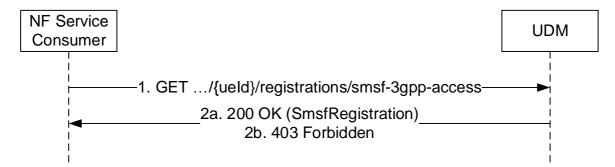


Figure 5.3.2.5.5-1: Requesting a UE's SMSF Registration Information for 3GPP Access

- 1. The NF service consumer (e.g. NEF) sends a GET request to the resource representing the UE's SMSF registration information for 3GPP access, with query parameters indicating the supported-features.
- 2a. The UDM responds with "200 OK" with the message body containing the UE's SmsfRegistration for 3GPP access.
- 2b. If the UE does not have required subscription data for SMS service or SMS service is barred, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

## 5.3.2.5.6 SmsfRegistration Information Retrieval for Non-3GPP Access

Figure 5.3.2.5.6-1 shows a scenario where the NF service consumer (e.g. NEF) sends a request to the UDM to retrieve the UE's SmsfRegistration Information for non-3GPPP access. The request contains the UE's identity (/{ueId}) which shall be a GPSI, the type of the requested information (/registrations/smsf-non-3gpp-access) and query parameters (supported-features).

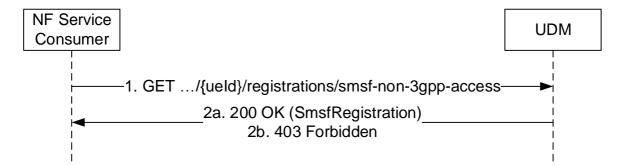


Figure 5.3.2.5.6-1: Requesting a UE's SMSF Registration Information for Non-3GPP Access

- 1. The NF service consumer (e.g. NEF) sends a GET request to the resource representing the UE's SMSF registration information for non-3GPP access, with query parameters indicating the supported-features.
- 2a. The UDM responds with "200 OK" with the message body containing the UE's SmsfRegistration for non-3GPP access.
- 2b. If the UE does not have required subscription data for SMS service or SMS service is barred, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

## 5.3.2.5.7 SmfRegistration Information Retrieval

Figure 5.3.2.5.7-1 shows a scenario where the NF service consumer (e.g. NWDAF) sends a request to the UDM to retrieve the UE's SmfRegistration Information. The request contains the UE's identity (/{ueId}) which shall be a GPSI or SUPI, the type of the requested information (/registration/smf-registrations) and query parameters (single-nssai, dnn, supported-features).

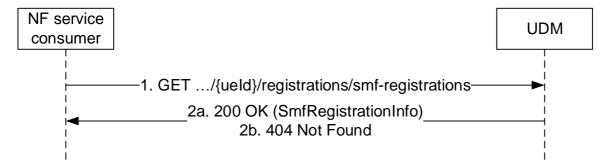


Figure 5.3.2.5.7-1: Requesting a UE's SMF Registration Information

- 1. The NF service consumer (e.g. NWDAF) sends a GET request to the resource representing the UE's SMF registration information, with query parameters indicating the single-nssai, dnn, supported-features.
- 2a. The UDM responds with "200 OK" with the message body containing the UE's SmfRegistrationInfo.
- 2b. If there is no valid SMF Registration data for the UE, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

## 5.3.2.5.8 Individual SmfRegistration Information Retrieval

NF Service Consumer (e.g. AMF) may send request to UDM to retrieve individual SMF registration information identified by PDU Session ID.

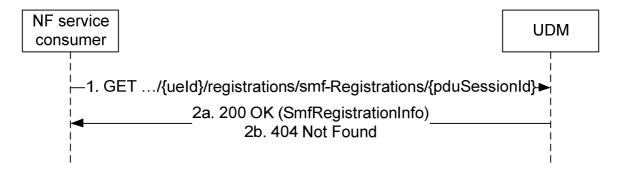


Figure 5.3.2.5.8-1: Requesting individual SMF Registration Information

- 1. The NF service consumer (e.g. AMF) sends a GET request to the resource representing the individual SMF registration information.
- 2a. The UDM responds with "200 OK" with the message body containing the SmfRegistration corresponding to the indicated PDU session.
- 2b. If there is no valid SMF Registration data for the indicated PDU session, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

#### 5.3.2.5.9 Location Information Retrieval

Figure 5.3.2.5.9-1 shows a scenario where the NF service consumer (e.g. (H)GMLC) sends a request to the UDM to retrieve the UE's Location Information. The request contains the UE's identity (/{ueId}), which shall be a GPSI or SUPI, and query parameters (supported-features).

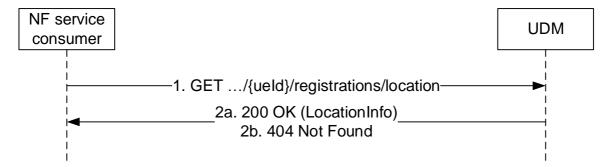


Figure 5.3.2.5.9-1: Requesting a UE's Location Information

- 1. The NF service consumer (e.g. (H)GMLC) sends a GET request to the resource representing the UE's Location information, with query parameters indicating the supported-features.
- 2a. The UDM responds with "200 OK" with the message body containing the UE's LocationInfo.
- 2b. If there is no valid location information data for the UE, a response with HTTP status code "404 Not Found" shall be returned to the NF service including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

# 5.3.2.5.10 Retrieval Of Multiple UE Registration Data Sets

Figure 5.3.2.5.10-1 shows a scenario where the NF service consumer (e.g. HSS, NWDAF, NSSAAF) sends a request to the UDM to receive multiple UE registration data sets. In this example scenario the UE's AMF registration data sets are retrieved with a single request; see clause 6.2.6.3.6 for other data sets that can be retrieved with a single request. The request contains the resource of UE's registrations({ueId}/registrations) and query parameters identifying the requested registration data sets (in this example: ?registration-dataset-names=AMF\_3GPP, AMF\_NON\_3GPP).



Figure 5.3.2.5.10-1: Retrieval of Multiple UE Registration Data Sets

- 1. The NF Service Consumer (e.g. HSS, NWDAF) sends a GET request to the resource representing the UE registrations. Query parameters indicate the requested UE registration data sets.
- 2. The UDM responds with "200 OK" with the message body containing the requested UE registration data sets.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

## 5.3.2.5.11 IP-SM-GW Registration Information Retrieval

Figure 5.3.2.5.11-1 shows a scenario where the NF service consumer sends a request to the UDM to retrieve the UE's IP-SM-GW Registration Information. The request contains the UE's identity (/{ueId}) which shall be a SUPI.

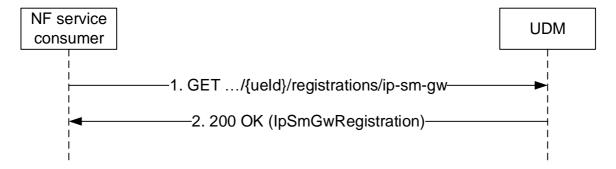


Figure 5.3.2.5.11-1: Requesting a UE's IP-SM-GW Registration Information

- 1. The NF service consumer sends a GET request to the resource representing the UE's IP-SM-GW registration information for 3GPP access.
- 2. The UDM responds with "200 OK" with the message body containing the UE's IP-SM-GW Registration.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

### 5.3.2.6 Update

## 5.3.2.6.1 General

The following procedures using the Update service operation are supported:

- Update a parameter (e.g. PEI, EPS Interworking Info, etc) in the AMF registration for 3GPP access
- Update a parameter (e.g.PEI) in the AMF registration for non-3GPP access

## 5.3.2.6.2 Update A Parameter (e.g. PEI) in the AMF Registration For 3GPP Access

Figure 5.3.2.6.2-1 shows a scenario where the AMF sends a request to the UDM to update a parameter within the Amf3GppAccessRegistration resource. The request contains the UE's identity (/{ueId}) which shall be a SUPI and an instruction to modify a parameter (e.g. PEI).

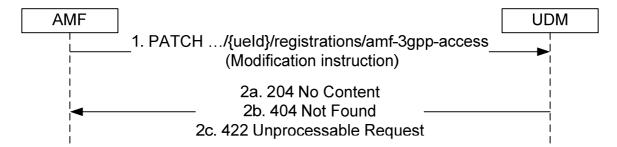


Figure 5.3.2.6.2-1: AMF registration parameter update for 3GPP access

- 1. The AMF sends a PATCH request to the resource representing the UE's AMF registration for 3GPP access.
- 2a. On success, the UDM responds with "204 No Content".
- 2b. If the resource does not exist e.g. the UE is not registered yet, HTTP status code "404 Not Found" should be returned including additional error information in the response body (in the "ProblemDetails" element).
- 2c. If the resource exists, but the requesting AMF is not the one currently registered for the UE, HTTP status code "422 Unprocessable Request" should be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PATCH response body.

### 5.3.2.6.3 Update A Parameter (e.g. PEI) in the AMF Registration For Non 3GPP Access

Figure 5.3.2.6.3-1 shows a scenario where the AMF sends a request to the UDM to update a parameter within the AmfNon3GppAccessRegistration resource. The request contains the UE's identity (/{ueId}) which shall be a SUPI and an instruction to modify a parameter (e.g. PEI).

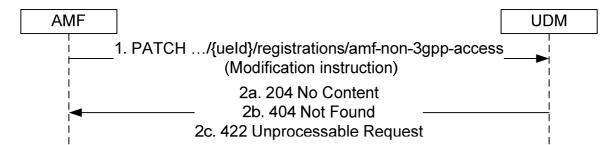


Figure 5.3.2.6.3-1: AMF registration parameter update for non-3GPP access

- 1. The AMF sends a PATCH request to the resource representing the UE's AMF registration for non-3GPP access.
- 2a. On success, the UDM responds with "204 No Content".
- 2b. If the resource does not exist e.g. the UE is not registered yet, HTTP status code "404 Not Found" should be returned including additional error information in the response body (in the "ProblemDetails" element).

2c. If the resource exists, but the requesting AMF is not the one currently registered for the UE, HTTP status code "422 Unprocessable Request" should be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PATCH response body.

### 5.3.2.7 P-CSCF-RestorationNotification

#### 5.3.2.7.1 General

The following procedure using the P-CSCF-RestorationNotification service operation is supported:

- UDM initiated P-CSCF-Restoration

## 5.3.2.7.2 UDM initiated P-CSCF-Restoration

Figure 5.3.2.7.2-1 shows a scenario where the UDM notifies the registered AMF or SMF about the need for P-CSCF restoration. The request contains the callback URI for P-CSCF restoration as received by the UDM during registration, and P-CSCF Restoration Indication.

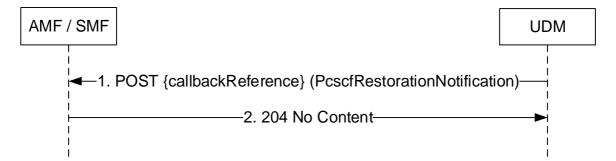


Figure 5.3.2.7.2-1: UDM initiated P-CSCF Restoration

- 1. The UDM sends a POST request to the callbackReference as provided by the NF service consumer during the registration.
- 2. The AMF or SMF responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

## 5.3.2.8 P-CSCF-RestorationTrigger

#### 5.3.2.8.1 General

The following procedure using the P-CSCF-RestorationTrigger service operation is supported:

- P-CSCF-RestorationTrigger

## 5.3.2.8.2 P-CSCF-RestorationTrigger

Figure 5.3.2.8.2-1 shows a scenario where the HSS sends a request to the UDM to initiate P-CSCF restoration. The request contains the UE's identity which shall be a SUPI.

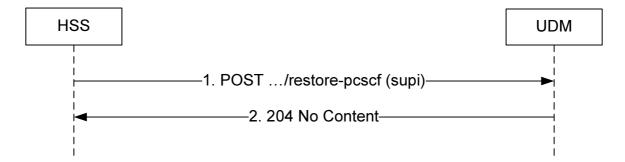


Figure 5.3.2.8.2-1: P-CSCF-RestorationTrigger

- 1. The HSS sends a POST request (custom method: restore-pcscf) to the UDM.
- 2. The UDM responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

## 5.3.2.9 AMFDeregistration

#### 5.3.2.9.1 General

The following procedure using the AMFDeregistration service operation is supported:

- AMF-Deregistration

## 5.3.2.9.2 AMF-Deregistration

Figure 5.3.2.9.2-1 shows a scenario where the HSS sends a request to the UDM to deregister the registered AMF. The request contains the UE's identity which shall be an IMSI.



Figure 5.3.2.9.2-1: AMF-Deregistration

- 1. The HSS sends a POST request (custom method: dereg-amf) to the resource representing the UE's registration for 3GPP access. This shall result in sending of Nudm\_UECM\_DeregistrationNotification to the AMF (see 3GPP TS 23.632 [32]) and setting the purgeFlag in the Amf3GppAccessRegistration stored in the UDR.
- 2a. The UDM responds with "204 No Content".
- 2b. If the user does not exist, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

# 5.3.2.10 PEI-Update

#### 5.3.2.10.1 General

The following procedure using the PEI-Update service operation is supported:

- PEI Update

## 5.3.2.10.2 PEI Update

Figure 5.3.2.10.2-1 shows a scenario where the HSS sends a request to the UDM to update the PEI attribute in the 3GPP Access Registration context. The request contains the UE's identity which shall be an IMSI.

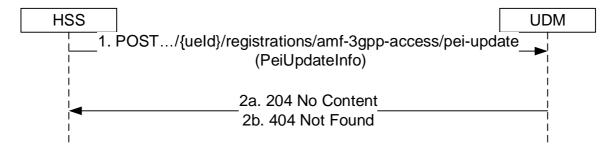


Figure 5.3.2.10.2-1: PEI Update

- 1. The HSS sends a POST request (custom method: pei-update) to the resource representing the UE's registration for 3GPP access. This shall result in updating the pei attribute in the Amf3gppAccessRegistration object and storing it in UDR.
- 2a. The UDM responds with "204 No Content".
- 2b. If the user does not exist, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

# 5.4 Nudm\_UEAuthentication Service

# 5.4.1 Service Description

See 3GPP TS 23.501 [2] table 7.2.5-1.

# 5.4.2 Service Operations

## 5.4.2.1 Introduction

For the Nudm UEAuthentication service the following service operations are defined:

- Get
- GetHssAv
- ResultConfirmation

The Nudm\_UEAuthentication service is used by the AUSF to request the UDM to select an authentication method, calculate a fresh authentication vector (AV) if required for the selected method, and provide it to the AUSF by means of the Get service operation. See 3GPP TS 33.501 [6] clause 14.2.2. The service may also be used by the AUSF to indicate to the UDM that the user is using a N5GC device behind Cable RGs in private networks or in isolated deployment

scenarios with wireline access and that therefore the applicable authentication method shall be EAP based. See 3GPP TS 23.316 [37] clause 4.10a.

The Nudm\_UEAuthentication service is also used by the HSS to request UDM to generate the authentication vector(s) for EPS or IMS domain by means of GetHssAv service operation. See 3GPP TS 23.632 [32] clause 5.6.3.

The Nudm\_UEAuthentication service is also used by the AUSF to inform the UDM about the occurrence of a successful or unsuccessful authentication by means of the ResultConfirmation service operation. See3GPP TS 33.501 [6] clause 14.2.3.

The Nudm\_UEAuthentication service is also used by the AUSF to request the UDM to authenticate the FN-RG accessing to 5GC via W-AGF. See 3GPP TS 23.316 [37] clause 7.2.1.3.

The Nudm\_UEAuthentication service is also used by the NF service consumer to request the UDM to remove the UE authentication result during the Purge of subscriber data in AMF after the UE deregisters from the network or NAS SMC fails following the successful authentication in the registration procedure.

#### 5.4.2.2 Get

#### 5.4.2.2.1 General

The following procedure using the Get service operation is supported:

- Authentication Information Retrieval
- FN-RG Authentication

As part of this Authentication Information Retrieval operation, the UDM authorizes or rejects the subscriber to use the service provided by the registered NF, based on subscription data (e.g. roaming restrictions).

As part of this FN-RG Authentication operation, the UDM decides, based on the stored authentication profile of the SUPI and the authenticated indication that authentication has been completed by the W-AGF, that authentication by the home network is not required for the FN-RG.

# 5.4.2.2.2 Authentication Information Retrieval

Figure 5.4.2.2.2-1 shows a scenario where the NF service consumer (AUSF) retrieves authentication information for the UE from the UDM (see also 3GPP TS 33.501 [6] clause 6.1.2). The request contains the UE's identity (supi or suci), the serving network name, and may contain resynchronization info.



Figure 5.4.2.2.1: NF service consumer requesting authentication information

- 1. The NF service consumer sends a POST request (custom method: generate-auth-data) to the resource representing the UE's security information.
- 2a. The UDM responds with "200 OK" with the message body containing the authentication data information.

The AUSF shall store the authentication data information for subsequent authentication processing. If the AUSF is configured to store Kausf (e.g. based on its support of SoRProtection / UPUProtection service operations), the AUSF shall preserve the Kausf and related information (e.g. SUPI) after the completion of the primary authentication.

2b. If the operation cannot be authorized due to e.g UE does not have required subcription data, none of the CAG IDs in the CAG cell match any of the CAG IDs in the allowed CAG list, access barring or roaming restrictions, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

## 5.4.2.2.3 FN-RG Authentication

Figure 5.4.2.2.3-1 shows a scenario where the NF service consumer (AUSF) requests the UDM to authenticate the FN-RG accessing to 5GC via W-AGF. (see also 3GPP TS 23.316 [37] clause 7.2.1.3). The request contains the UE's identity (suci), and the authenticated indication.

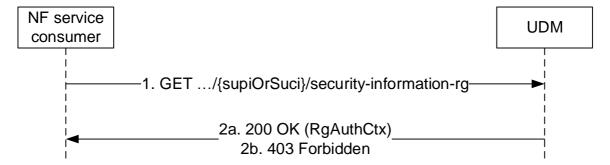


Figure 5.4.2.2.3-1: NF service consumer requesting authentication information for FN-RG

- 1. The NF service consumer sends a GET request to the resource representing the UE's security information.
- 2a. The UDM responds with "200 OK" with the message body containing the authentication data information of FN-RG
- 2b. If the operation cannot be authorized due to e.g. UE does not have required subcription data, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

# 5.4.2.3 ResultConfirmationInform

#### 5.4.2.3.1 General

The following procedure using the ResultConfirmation service operation is supported:

- Authentication Confirmation
- Authentication Result Removal

## 5.4.2.3.2 Authentication Confirmation

Figure 5.4.2.3.2-1 shows a scenario where the NF service consumer (AUSF) confirms the occurence of a successful or unsuccessful authentication in a serving network to the UDM (see also 3GPP TS 33.501 [6] clause 6.1.4.1a). The request contains the UE's identity (supi), and information about the authentication occurrence (AuthEvent).

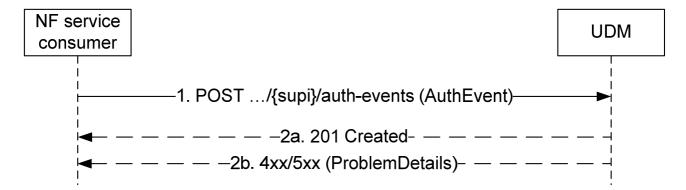


Figure 5.4.2.3.2-1: NF service consumer confirms UE authentication

- 1. The NF service consumer sends a POST request to the resource representing the UE's authentication events. The payload body of the POST request shall contain a representation of the individual AuthEvent resource to be created. There shall be only one individual AuthEvent per UE per Serving Network identified by the supi in URI and servingNetworkName in AuthEvent.
- 2a. On success, the UDM responds with "201 Created" and the "Location" header shall be present and shall contain the URI of the created resource.
- 2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned.

#### 5.4.2.3.3 Authentication Result Removal

Figure 5.4.2.3.3-1 shows a scenario where the NF service consumer requests the UDM to remove the Authentication Result. The request contains the UE's identity (supi), the authEvent Id, and an indication to remove Authentication result.

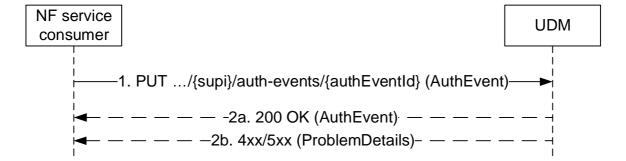


Figure 5.4.2.3.3-1: NF service consumer removes the authentication result

- 1. The NF service consumer shall send a PUT request to the UDM. The payload of the body shall contain the indication to remove authentication result.
- 2a. On success, "204 No Content" shall be returned. The UDM shall remove the Authentication result of the UE by completely replacing the individual AuthEvent resource.
- 2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned.

## 5.4.2.4 GetHssAv

#### 5.4.2.4.1 General

The following procedure using the GetHssAv service operation is supported:

- HSS Authentication Vector Retrieval

#### 5.4.2.4.2 HSS Authentication Vector Retrieval

Figure 5.4.2.4.2-1 shows a scenario where the NF service consumer (HSS) retrieves authentication vector(s) for the UE from the UDM (see also 3GPP TS 23.632 [32] clause 5.6.3). The request contains the UE's identity (SUPI), the authentication method, serving network id, and may contain resynchronization info.

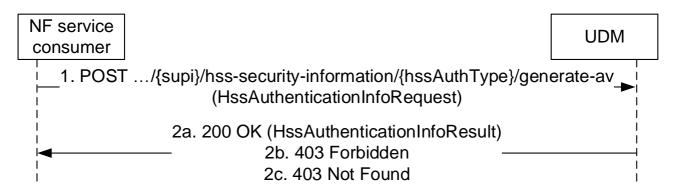


Figure 5.4.2.4.2-1: NF service consumer requesting authentication vector(s)

- 1. The NF service consumer sends a POST request (custom method: generate-av) to the resource representing the UE's HSS security information; the type of requested AV is included as part of the resource URI.
- 2a. The UDM responds with "200 OK" with the message body containing the authentication vector(s).
- 2b. If the operation cannot be authorized due to e.g UE does not have required subcription data, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "ProblemDetails" element).
- 2c. If the user does not exist, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

# 5.5 Nudm EventExposure Service

# 5.5.1 Service Description

See 3GPP TS 23.501 [2] table 7.2.5-1.

# 5.5.2 Service Operations

## 5.5.2.1 Introduction

For the Nudm EventExposure service the following service operations are defined:

- Subscribe
- Unsubscribe
- Notify
- ModifySubscription

The Nudm\_EventExposure service is used by consumer NFs (e.g. NEF) to subscribe to notifications of event occurrence by means of the Subscribe service operation. For events that can be detected by the AMF, the UDM makes use of the appropriate AMF service operation to subscribe on behalf of the consumer NF (e.g. NEF).

The Nudm\_EventExposure service is also used by the consumer NFs (e.g. NEF) that have previously subscribed to notificatios, to unsubscribe by means of the Unsubscribe service operation. For events that can be detected by the AMF, the UDM makes use of the appropriate AMF service operation to unsubscribe on behalf of the consumer NF (e.g. NEF).

The Nudm\_EventExposure service is also used by the subscribed consumer NFs (e.g. NEF) to get notified by the UDM when a subscribed event occurs at the UDM by means of the Notify service operation. For subscribed events that can occur at the AMF, the consumer NF (e.g. NEF) makes use of the corresponding AMF service operation to get notified by the AMF directly without UDM involvement.

The Nudm\_EventExposure service is also used by the subscribed consumer NFs (e.g. NEF) to modify an existing subscription by means of the ModifySubscription service operation.

For details see 3GPP TS 23.502 [3] clause 4.15.

### 5.5.2.2 Subscribe

#### 5.5.2.2.1 General

The following procedures using the Subscribe service operation are supported:

- Subscribe to Notification of event occurrence

# 5.5.2.2.2 Subscription to Notification of event occurrence

Figure 5.5.2.2.2-1 shows a scenario where the NF service consumer sends a request to the UDM to subscribe to notifications of event occurrence (see also 3GPP TS 23.502 [3] figure 4.15.3.2.2-1 step 1 and 3GPP TS 23.502 [3] Figure 4.15.3.2.3b-1 step 1). The request contains a callback URI, the type of event that is monitored and additional information e.g. event filters and reporting options.

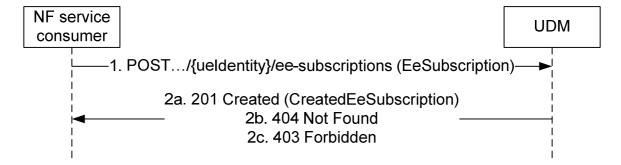


Figure 5.5.2.2.2-1: NF service consumer subscribes to notifications

- 1. The NF service consumer sends a POST request to the parent resource (collection of subscriptions) (.../{ueIdentity}/ee-subscriptions), to create a subscription as present in message body. The values ueIdentity shall take are specified in Table 6.4.3.2.2-1. The request may contain an expiry time, suggested by the NF Service Consumer, representing the time upto which the subscription is desired to be kept active and the time after which the subscribed event(s) shall stop generating notifications, the indication on whether the subscription applies also to EPC.
  - If MTC Provider information and/or AF ID are received in the request, the UDM shall check whether the MTC Provider and/or the AF is allowed to perform this operation for the UE; otherwise, the UDM shall skip the MTC provider and/or AF authorization check.
- 2a. On success, the UDM responds with "201 Created" with the message body containing a representation of the created subscription. The Location HTTP header shall contain the URI of the created subscription. If the event subscription was for a group of UEs:
  - The "maxNumOfReports" in the "reportingOptions" IE shall be applicable to each UE in the group;
  - The UDM shall return the number of UEs in that group in the "numberOfUes" IE.

The NF service consumer shall keep track of the maximum number of reports reported for each UE in the event report and when "maxNumOfReports\*numberOfUes" limit is reached, the NF service consumer shall initiate the unsubscription of the notification towards the UDM (see clause 5.5.2.3.2).

The response, based on operator policy, may contain the expiry time, as determined by the UDM, after which the subscription becomes invalid. Once the subscription expires, if the NF Service Consumer wants to keep receiving notifications, it shall create a new subscription in the UDM. The NF Service Producer shall not provide the same expiry time for many subscriptions in order to avoid all of them expiring and recreating the subscription at the same time. If the expiry time is not included in the response, the NF Service Consumer shall not associate an expiry time for the subscription.

If the indication on whether the subscription applies also to EPC is included in the request, the response shall include the indication on whether the subscription was also successful in EPC domain.

If the event subscription was for a list events, the "maxNumOfReports" in the "reportingOptions" IE shall be applicable to each event. The NF service consumer shall keep track of the maximum number of reports reported for each event in the event report and when "maxNumOfReports\*number of events" limit is reached, the NF service consumer shall initiate the unsubscription of the notification towards the UDM (see clause 5.5.2.3.2).

- 2b. If the user does not exist, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).
- 2c. If there is no valid subscription data for the UE, i.e. based on the UE's subscription information monitoring of the requested EventType is not allowed, or the requested EventType is not supported, or when MTC Provider or AF are not allowed to perform this operation for the UE,HTTP status code "403 Forbidden" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

5.5.2.2.3 Void

#### 5.5.2.3 Unsubscribe

### 5.5.2.3.1 General

The following procedures using the Unsubscribe service operation are supported:

- Unsubscribe to Notifications of event occurrence

#### 5.5.2.3.2 Unsubscribe to notifications of event occurrence

Figure 5.5.2.3.2-1 shows a scenario where the NF service consumer sends a request to the UDM to unsubscribe from notifications of event occurrence. The request contains the URI previously received in the Location HTTP header of the response to the subscription.

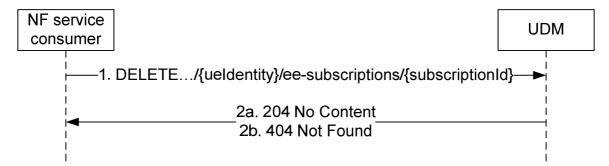


Figure 5.5.2.3.2-1: NF service consumer unsubscribes to notifications

1. The NF service consumer sends a DELETE request to the resource identified by the URI previously received during subscription creation.

- 2a. On success, the UDM responds with "204 No Content".
- 2b. If there is no valid subscription available (e.g. due to an unknown SubscriptionId value), HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the DELETE response body.

## 5.5.2.4 Notify

#### 5.5.2.4.1 General

The following procedures using the Notify service operation are supported:

- Event Occurrence Notification

## 5.5.2.4.2 Event Occurrence Notification

Figure 5.5.2.4.2-1 shows a scenario where the UDM notifies the NF service consumer (that has subscribed to receive such notification) about occurrence of an event (see also 3GPP TS 23.502 [3] figure 4.15.3.2.2-1 step 4a). The request contains the callbackReference URI as previously received in the EeSubscription (see clause 6.4.6.2.2).

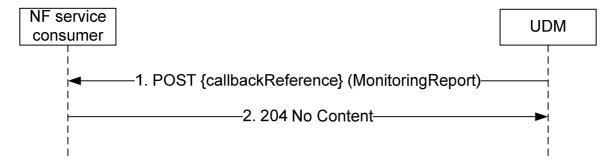


Figure 5.5.2.4.2-1: Event Occurrence Notification

- The UDM sends a POST request to the callbackReference as provided by the NF service consumer during the subscription, the request shall include in each report the Reference ID of the associated monitoring configuration.
- 2. The NF Service Consumer responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

# 5.5.2.5 ModifySubscription

#### 5.5.2.5.1 General

The following procedures using the ModifySubscription service operation are supported:

- Modification of an EE-Subscription to notification of events

### 5.5.2.5.2 Modification of a subscription

The service operation is invoked by a NF Service Consumer, e.g. NEF, towards the UDM, when it needs to modify an existing subscription previously created by itself at the UDM.

The NF Service Consumer shall modify the subscription by using HTTP method PATCH with the URI of the individual subscription resource (see clause 6.4.3.3) to be modified.

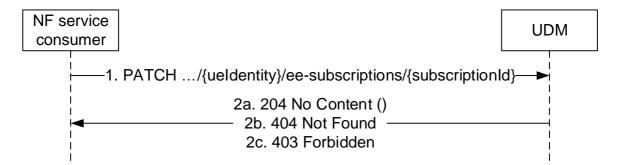


Figure 5.5.2.5.2-1: NF service consumer updates subscription

- 1. The NF service consumer (e.g. NEF) shall send a PATCH request to the resource representing a subscription. The modification may be for the events subscribed or for updating the event report options.
- 2a. On success, the request is accepted, the UDM shall respond with "204 No Content".
- 2b. If the resource does not exist e.g. the subscriptionId cannot be found, HTTP status code "404 Not Found" should be returned including additional error information in the response body (in the "ProblemDetails" element).
- 2c. If the modification can't be accepted, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PATCH response body.

# 5.6 Nudm ParameterProvision Service

# 5.6.1 Service Description

See 3GPP TS 23.501 [2] table 7.2.5-1.

# 5.6.2 Service Operations

## 5.6.2.1 Introduction

For the Nudm\_ParameterProvision service the following service operations are defined:

- Update
- Create
- Delete
- Get

The Nudm\_ParameterProvision service is used by consumer NFs (e.g. NEF) to update a UE's or a group of UEs' subscription data by means of the Update service operation.

For details see 3GPP TS 23.502 [3] clause 4.15.6.2.

The Nudm\_ParameterProvision service can also be used by a NF Service Consumer (e.g. SOR-AF) to send updated Steering of Roaming Information for a UE to the UDM at any time, as specified in Annex C.3 of 3GPP°TS°23.122°[20].

# 5.6.2.2 Update

#### 5.6.2.2.1 General

The following procedures using the Update service operation are supported:

- Subscription data update
- SoR Information update
- 5G VN Group modification

## 5.6.2.2.2 Subscription data update

Figure 5.6.2.2.2-1 shows a scenario where the NF service consumer (e.g. NEF, AMF) sends a request to the UDM to update a UE's subscription data (see 3GPP TS 23.502 [3] figure 4.15.6.2-1 step 2 and also 3GPP TS 23.273 [38] Figure 6.12.1-1 step 2). The request contains the identifier of the UE's parameter provision data ( .../{ueId}/pp-data) and the modification instructions. The values ueId shall take are specified in Table 6.5.3.2.2-1.

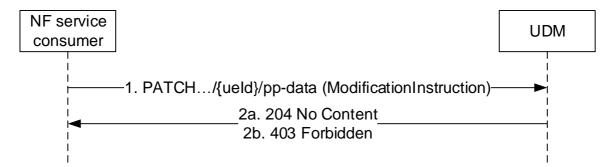


Figure 5.6.2.2.2-1: NF service consumer updates subscription data

1. The NF service consumer (e.g. NEF, AMF) sends a PATCH request to the resource that represents a UE's modifiable subscription data.

If MTC Provider information and/or AF ID are received in the request, the UDM shall check whether the MTC Provider and/or the AF is allowed to perform this operation for the UE; otherwise, the UDM shall skip the MTC provider and/or AF authorization check.

- 2a. The UDM responds with "204 No Content".
- 2b. If MTC Provider or AF are not allowed to perform this operation for the UE, HTTP status code "403 Forbidden" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

NOTE: Upon reception of an update or removal of maximum latency, maximum response time or DL Buffering Suggested Packet Count, UDM may need to adjust the value of active time and/or periodic registration timer and/or DL Buffering Suggested Packet Count and the UDM shall notify AMF and/or SMF if the values are updated (see clause 4.15.6.3a of 3GPP TS 23.502 [3]).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PATCH response body.

#### 5.6.2.2.3 5G VN Group modification

Figure 5.6.2.2.3-1 shows a scenario where the NF service consumer sends a request to the UDM to modify an external group id's group data. The request contains the external group identifier of the group and the modification instructions.

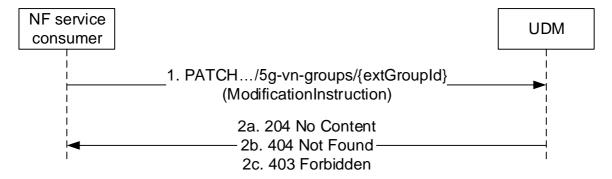


Figure 5.6.2.2.3-1: NF service consumer modifies a 5G VN Group

1. The NF service consumer sends a PATCH request to the resource that represents a 5G VN Group.

If MTC Provider information and/or AF ID are received in the request, the UDM shall check whether the MTC Provider and/or the AF is allowed to perform this operation for the UE; otherwise, the UDM shall skip the MTC provider and/or AF authorization check.

- 2a. On success, the UDM responds with "204 No Content".
- 2b. If the external group id does not exist in the UDM, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).
- 2c. If MTC Provider or AF are not allowed to perform this operation for the UE, HTTP status code "403 Forbidden" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PATCH response body.

## 5.6.2.2.4 SoR Information update

Figure 5.6.2.2.4-1 shows a scenario where the NF service consumer (e.g. SOR-AF) sends updated SoR Information for a UE to the UDM to trigger the sending of this updated SoR Information to the UE via the AMF (as per Annex C.3 of 3GPP TS 23.122 [20]). The request contains the identifier of the UE's parameter provision data ( .../{ueId}/pp-data), the SUPI in this case, and the modification instructions.

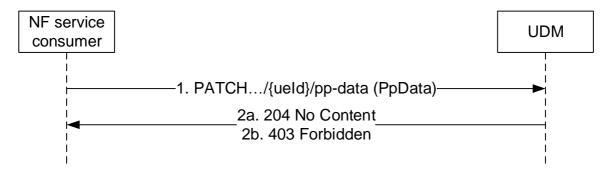


Figure 5.6.2.2.4-1: NF service consumer updates SoR Information for a UE

1. The NF service consumer (e.g. SOR-AF) sends a PATCH request to the resource that represents a UE's modifiable subscription data, containing updated Steering of Roaming Information for a UE.

The UDM, after contacting the AUSF to perform integrity protection and getting the related information (sorMacIausf and coutersor), shall immediately convey this updated SoR Information to the concerned UE by triggering a notification to the registered AMF (that has subscribed to receive notifications on change of AccessAndMobilitySubscriptionData) for the UE, if any, as per annex C.3 of 3GPP TS 23.122 [20]. Once the subscribing AMF is notified (or when no AMF has subscribed), the UDM shall delete the updated SorInfo and shall not send it as part of AccessAndMobilitySubscriptionData to an NF (e.g. AMF) retrieving the AccessAndMobilitySubscriptionData.

2a. The UDM responds with "204 No Content".

2b. If the operation cannot be authorized due to e.g UE isn't registered in the network, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PATCH response body.

#### 5.6.2.3 Create

#### 5.6.2.3.1 General

The following procedures using the Create service operation are supported:

- 5G-VN-Group creation

# 5.6.2.3.2 5G-VN-Group creation

Figure 5.6.2.3.2-1 shows a scenario where the NF service consumer sends a request to the UDM to create a 5G VN Group. The request contains the group's external identifier and the group configuration.

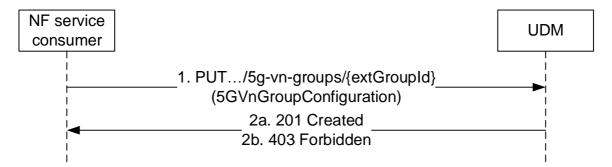


Figure 5.6.2.3.2-1: NF service consumer creates a 5G-VN-Group

1. The NF service consumer sends a PUT request to the resource .../5g-vn-groups/{extGroupId}, to create a 5G VN Group as present in the message body.

If MTC Provider information and/or AF ID are received in the request, the UDM shall check whether the MTC Provider and/or the AF is allowed to perform this operation for the UE; otherwise, the UDM shall skip the MTC provider and/or AF authorization check.

- 2a. On success the UDM responds with "201 Created".
- 2b. If the creation can't be accepted (e.g. MTC Provider or AF are not allowed to perform this operation for the UE), HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PUT response body.

#### 5.6.2.4 Delete

# 5.6.2.4.1 General

The following procedures using the Delete service operation are supported:

- 5G-VN-Group deletion

# 5.6.2.4.2 5G-VN-Group deletion

Figure 5.6.2.4.2-1 shows a scenario where the NF service consumer sends a request to the UDM to delete a 5G VN Group. The request contains the group's external identifier.

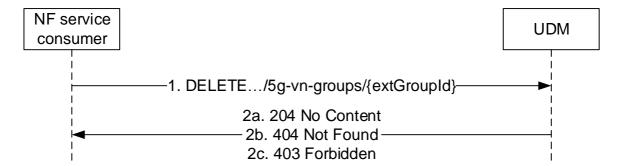


Figure 5.6.2.4.2-1: NF service consumer deletes a 5G-VN-Group

1. The NF service consumer sends a DELETE request to the resource .../5g-vn-groups/{extGroupId}, to delete the 5G VN Group identified by the external group id.

If MTC Provider information and/or AF ID are received in the request, the UDM shall check whether the MTC Provider and/or the AF is allowed to perform this operation for the UE; otherwise, the UDM shall skip the MTC provider and/or AF authorization check.

- 2a. On success, the UDM responds with "204 No Content".
- 2b. If the external group id does not exist in the UDM, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).
- 2c. If MTC Provider or AF are not allowed to perform this operation for the UE, HTTP status code "403 Forbidden" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the DELETE response body.

# 5.6.2.5 Get

#### 5.6.2.5.1 General

The following procedures using the Get service operation are supported:

- 5G-VN-Group get

## 5.6.2.5.2 5G-VN-Group get

Figure 5.6.2.5.2-1 shows a scenario where the NF service consumer sends a request to the UDM to get 5G VN Group. The request contains the group's external identifier.

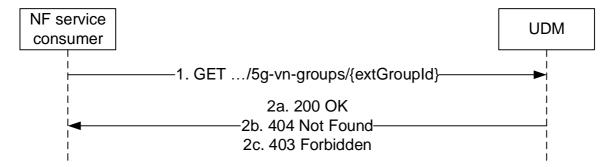


Figure 5.6.2.5.2-1: NF service consumer gets 5G-VN-Group

- 1. The NF service consumer sends a GET request to the resource .../5g-vn-groups/{extGroupId}, to get the 5G VN Group identified by the external group id.
- 2a. On success, the UDM responds with "200 Ok" with the VPN Group Information

- 2b. If the external group id does not exist in the UDM, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).
- 2c. If the original AF is not allowed to get this information, HTTP status code "403 Forbidden" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

# 5.7 Nudm\_NIDDAuthorization Service

# 5.7.1 Service Description

See 3GPP TS 23.501 [2] table 7.2.5-1.

Editor's Note: 3GPP TS 23.502 describes Nudm\_NIDDAuthorization Service, update of table 3GPP TS 23.501 [2] table 7.2.5-1 is outstanding.

# 5.7.2 Service Operations

# 5.7.2.1 Introduction

For the Nudm\_NIDDAuthorization service the following service operations are defined:

- Get
- Notification

The Nudm\_NIDDAuthorization Service is used by Consumer NFs (NEF) to retrieve the UE's authorization for NIDD Configuration relevant to the consumer NF from the UDM by means of the Get service operation.

It is also used by the Consumer NFs (NEF) that have previously subscribed, to get notified by means of the Notification service operation when UDM decides to modify the subscribed data.

# 5.7.2.2 Get

#### 5.7.2.2.1 General

The following procedures using the Get service operation are supported:

- NIDD Authorization Data Retrieval

#### 5.7.2.2.2 NIDD Authorization Data Retrieval

Figure 5.7.2.2.2-1 shows a scenario where the NF service consumer (e.g. NEF) sends a request to the UDM to authorize the NIDD configuration request (see also 3GPP TS 23.502 [3] figure 4.25.3-1 step 4). The request contains the UE's identity (/{ueIdentity}), and information used for NIDD authorization (AuthorizationInfo).

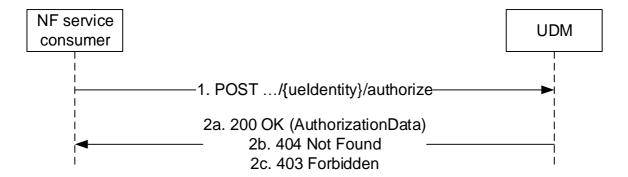


Figure 5.7.2.2.2-1: Requesting a UE's NIDD Authorization Data

- 1. The NF service consumer (e.g. NEF) sends a POST request to invoke "authorize" custom method on the resource representing the UE's subscribed NIDD authorization information. The payload of the request shall be an object of "AuthorizationInfo" which shall contain NSSAI, DNN, MTC Provider Information, callback URI.
  - If MTC Provider information and/or AF ID are received in the request, the UDM shall check whether the MTC Provider and/or the AF is allowed to perform this operation for the UE; otherwise, the UDM shall skip the MTC provider and/or AF authorization check.
- 2a. On success, the UDM responds with "200 OK" with the message body containing the single value or list of AuthorizationData (SUPI and GPSI) as relevant for the requesting NF service consumer.
- 2b. If there is no valid AuthorizationData for the UE Identity, HTTP status code "404 Not Found" shall be returned including additional error information in the response body (in the "ProblemDetails" element).
- 2c. If SNSSAI and/or DNN are not authorized for this UE, or MTC Provider or AF are not allowed to perform this operation for the UE, HTTP status code "403 Forbidden" shall be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

Editor's Note: On success if the response exceeds the maximum length of a message segmentation need to be introduced, how this is done is FFS.

# 5.7.2.3 Notification

#### 5.7.2.3.1 General

The following procedures using the Notification service operation are supported:

- NIDD Authorization Data Update Notification

#### 5.7.2.3.2 NIDD Authorization Data Update Notification

Figure 5.7.2.3.2-1 shows a scenario where the UDM notifies the NF service consumer (that has subscribed to receive such notification) about subscription data change (see also 3GPP TS 23.502 [3] figure 4.25.6-1 step 1 and 2). The request contains the callbackReference URI as previously received by the UDM during NIDD Authorization Data Retrieval.

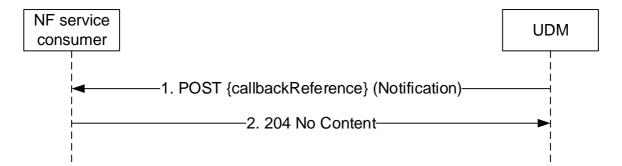


Figure 5.7.2.3.2-1: Requesting a UE's NIDD Authorization Data

- The UDM sends a POST request to the callbackReference as provided by the NF service consumer during NIDD Authorization Data Retrieval.
- 2. The NF service consumer responds with "204 No Content".

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

# 5.8 Nudm\_MT Service

# 5.8.1 Service Description

See 3GPP TS 23.632 [32].

# 5.8.2 Service Operations

# 5.8.2.1 Introduction

For the Nudm\_MT service the following service operations are defined:

- ProvideUeInfo
- ProvideLocationInfo

The Nudm\_MT service is used by the HSS to request the UDM to provide terminating access domain selection information and/or user state and/or 5GSRVCCInfo by means of the ProvideUeInfo service operation.

It is also used by the HSS to request the UE's Location Information in 5GC by means of the ProvideLocationInfo service operation.

# 5.8.2.2 ProvideUeInfo

# 5.8.2.2.1 General

The following procedure using the ProvideUeInfo service operation is supported:

- UE Information Retrieval

# 5.8.2.2.2 UE Information Retrieval

Figure 5.8.2.2.2-1 shows a scenario where the NF service consumer (HSS) retrieves domain selection information and/or user state and/or 5GSRVCCInfo for a UE from the UDM. The request contains the UE's identity (supi).

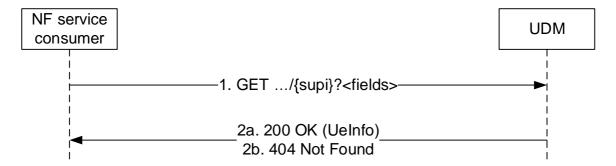


Figure 5.8.2.2.2-1: NF service consumer requesting domain selection information

- 1. The NF service consumer sends a GET request to the UDM to query the UeInfo. Query parameters indicate that TadsInfo and/or UserState and/or 5GSRVCCInfo is requested.
- 2a. The UDM responds with "200 OK" with the message body containing the requested information.
- 2b. If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned and additional error information should be included in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

#### 5.8.2.3 ProvideLocationInfo

#### 5.8.2.3.1 General

The following procedure using the ProvideLocationInfo service operation is supported:

- Network Provided Location Information Request

## 5.8.2.3.2 Network Provided Location Information Request

Figure 5.8.2.3.2-1 shows a scenario where the NF service consumer (HSS) request UE's location information from UDM. The request contains the UE's identity (supi), and requested information (current location, local time zone, RAT type, or serving node identity)

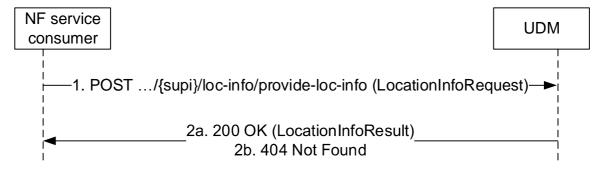


Figure 5.8.2.3.2-1: NF service consumer requesting domain selection information

- 1. The NF service consumer sends a POST request (custom method: provide-loc-info) to the resource representing UE's location information in 5GC.
- 2a. The UDM responds with "200 OK" with the message body containing the requested information.
- 2b. If there is no valid subscription data for the UE, or the requested information is not available, HTTP status code "404 Not Found" shall be returned and additional error information should be included in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

# 6 API Definitions

# 6.1 Nudm\_SubscriberDataManagement Service API

# 6.1.1 API URI

The Nudm\_SDM service shall use the Nudm\_SDM API.

The API URI of the Nudm\_SDM API shall be:

### {apiRoot}/<apiName>/<apiVersion>/

The request URI used in HTTP request from the NF service consumer towards the NF service producer shall have the structure defined in clause 4.4.1 of 3GPP TS 29.501 [5], i.e.:

#### {apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [5].
- The <apiName> shall be "nudm-sdm".
- The <apiVersion> shall be "v2".
- The <apiSpecificResourceUriPart> shall be set as described in clause 6.1.3.

# 6.1.2 Usage of HTTP

# 6.1.2.1 General

HTTP/2, as defined in IETF RFC 7540 [13], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

HTTP/2 shall be transported as specified in clause 5.3 of 3GPP TS 29.500 [4].

HTTP messages and bodies for the Nudm\_SDM service shall comply with the OpenAPI [14] specification contained in Annex A2.

# 6.1.2.2 HTTP standard headers

## 6.1.2.2.1 General

The usage of HTTP standard headers shall be supported as specified in clause 5.2.2 of 3GPP TS 29.500 [4].

# 6.1.2.2.2 Content type

The following content types shall be supported:

JSON, as defined in IETF RFC 8259 [15], signalled by the content type "application/json".

The Problem Details JSON Object (IETF RFC 7807 [16] signalled by the content type "application/problem+json"

JSON Merge Patch, as defined in IETF RFC 7396 [17], signalled by the content type "application/merge-patch+json"

# 6.1.2.2.3 Cache-Control

As described in IETF RFC 7234 [26] clause 5.2, a "Cache-Control" header should be included in HTTP responses except for non-cacheable resources (e.g. UeContextInSmsfData). If it is included, it shall contain a "max-age" value, indicating the amount of time in seconds after which the received response is considered stale.

The "max-age" value shall be configurable by operator policy.

# 6.1.2.2.4 ETag

As described in IETF RFC 7232 [25] clause 2.32, an "ETag" (entity-tag) header should be included in HTTP responses except for non-cacheable resources (e.g. UeContextInSmfData) to allow an NF Service Consumer performing a conditional request with "If-None-Match" header. If it is included, it shall contain a server-generated strong validator, that allows further matching of this value (included in subsequent client requests) with a given resource representation stored in the server or in a cache.

#### 6.1.2.2.5 If-None-Match

As described in IETF RFC 7232 [25] clause 3.2, an NF Service Consumer may issue conditional GET request towards UDM by including an "If-None-Match" header in HTTP requests containing one or several entity tags received in previous responses for the same resource.

#### 6.1.2.2.6 Last-Modified

As described in IETF RFC 7232 [25] clause 2.2, a "Last-Modified" header should be included in HTTP responses except for non-cacheable resources (e.g. SorAck) to allow an NF Service Consumer performing a conditional request with "If-Modified-Since" header.

#### 6.1.2.2.7 If-Modified-Since

As described in IETF RFC 7232 [25] clause 3.3, an NF Service Consumer may issue conditional GET request towards UDM, by including an "If-Modified-Since" header in HTTP requests.

# 6.1.2.2.8 When to Use Entity-Tags and Last-Modified Dates

Both "ETag" and "Last-Modified" headers should be sent in the same HTTP response as stated in IETF RFC 7232 [25] clause 2.4.

NOTE: "ETag" is a stronger validator than "Last-Modified" and is preferred.

If the NF Service Producer included an "ETag" header with the resource then a conditional request for this resource shall be performed with the "If-None-Match" header.

# 6.1.2.3 HTTP custom headers

### 6.1.2.3.1 General

The usage of HTTP custom headers shall be supported as specified in clause 5.2.3 of 3GPP TS 29.500 [4].

# 6.1.3 Resources

# 6.1.3.1 Overview

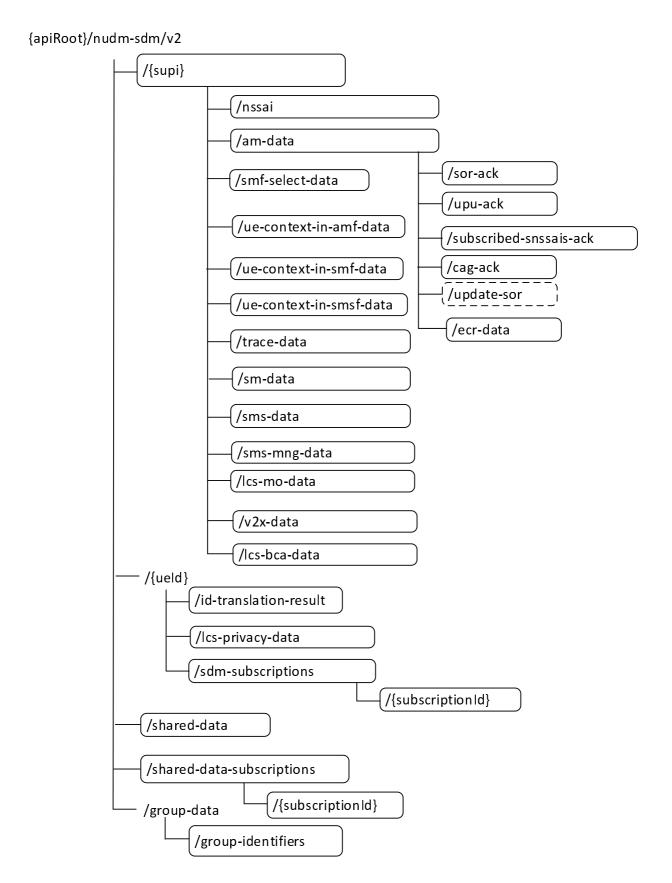


Figure 6.1.3.1-1: Resource URI structure of the nudm-sdm API

Table 6.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.1.3.1-1: Resources and methods overview

Resource name (Archetype)	Resource URI	HTTP method or custom operation	Description
Supi (Document)	/{supi}	GET	Retrieve UE's subscription data
Nssai (Document)	/{supi}/nssai	GET	Retrieve the UE's subscribed Network Slice Selection Assistance Information
UeContextInAmfData (Document)	/{supi}/ue-context-in-amf-data		Retrieve the UE's Context in AMF Data
AccessAndMobilitySubscription Data	/{supi}/am-data	GET	Retrieve the UE's subscribed Access and Mobility Data
(Document)	/{supi}/am-data/update-sor	update- sor (POST)	Trigger the update of Steering of Roaming Information at the UE
SorAck (Document)	/{supi}/am-data/sor-ack	PUT	Providing acknowledgement of Steering of Roaming
UpuAck (Document)	/{supi}/am-data/upu-ack	PUT	Providing acknowledgement of UE parameters update
CagAck (Document)	/{supi}/am-data/cag-ack	PUT	Providing acknowledgement of UE CAG configuration update
EnhancedCoverageRestriction Data	/{supi}/am-data/ecr-data	GET	Retrieve the UE's subscribed Enhance Coverage Restriction Data
SmfSelectionSubscriptionData (Document)	/{supi}/smf-select-data	GET	Retrieve the UE's subscribed SMF Selection Data
UeContextInSmfData (Document)	/{supi}/ue-context-in-smf-data	GET	Retrieve the UE's Context in SMF Data
SessionManagementSubscripti onData (Document)	/{supi}/sm-data	GET	Retrieve the UE's session management subscription data
SMSSubscriptionData (Document)	/{supi}/sms-data	GET	Retrieve the UE's SMS subscription data
SMSManagementSubscription Data (Document)	/{supi}/sms-mng-data	GET	Retrieve the UE's SMS management subscription data
LcsPrivacySubscriptionData (Document)	/{ueld}/lcs-privacy-data	GET	Retrieve the UE's LCS privacy subscription data
LcsMobileOriginatedSubscripti onData (Document)	/{supi}/lcs-mo-data	GET	Retrieve the UE's LCS Mobile Originated subscription data
LcsBroadcastAssistanceSubsc riptionData (Document)	/{supi}/lcs-bca-data	GET	Retrieve the UE's LCS Broadcast Assistance subscription data
V2xSubscriptionData (Document)	/{supi}/v2x-data	GET	Retrieve the UE's V2X subscription data
SdmSubscriptions (Collection)	/{ueld}/sdm-subscriptions	POST	Create a subscription
Individual subscription (Document)	/{ueld}/sdm- subscriptions/{subscriptionId}	DELETE PATCH	Delete the subscription identified by {subscriptionId}, i.e. unsubscribe Modify the sdm-subscription
IdTropoletics Decult	((ald));d translation result		identified by {subscriptionId}
IdTranslationResult (Document)	/{ueld}/id-translation-result	GET	Retrieve a UE's SUPI or GPSI
UeContextInSmsfData (Document)	/{supi}/ue-context-in-smsf-data	GET	Retrieve the UE's Context in SMSF Data
TraceData (Document)	/{supi}/trace-data	GET	Retrieve Trace Configuration Data
SharedData (Collection)	/shared-data	GET	Retrieve shared data
SharedDataSubscriptions (Collection)	/shared-data-subscriptions	POST	Create a subscription
SharedDataIndividual subscription	/shared-data- subscriptions/{subscriptionId}	DELETE	Delete the subscription identified by {subscriptionId}, i.e. unsubscribe
(Document)		PATCH	Modify the shared data subscription identified by {subscriptionId}

GroupIdentifiers (Document)	/group-data/group-identifiers	GET	Retrieve group identifiers and the UE identifiers belong to the group identifiers.
SnssaisAck (Document)	/{supi}/am-data/subscribed- snssais-ack	PUT	Providing acknowledgement of UE for subscribed S-NSSAIs

# 6.1.3.2 Resource: Nssai (Document)

# 6.1.3.2.1 Description

This resource represents the subscribed Nssai for a SUPI. It is queried by the AMF before registering, and is used to assist network slice selection. See 5.2.2.2.2 and 3GPP TS 23.501 [2] clause 5.15.3.

This resource is also queried by the PGW-C+SMF during PDN connection establishment in the EPC, and is used to select the S-NSSAI provided to the UE, see 3GPP TS 23.501 [2] clause 4.11.0a.5. The PGW-C+SMF shall not indicate support to "Nssaa" feature (see clause 6.1.8) in this query to UDM. If a slice is not present in the Nssai resource returned by UDM, i.e. not subscribed by the UE or subject to Network Slice-Specific Authentication and Authorization, the slice shall not be selected by the PGW-C+SMF.

#### 6.1.3.2.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/nssai

This resource shall support the resource URI variables defined in table 6.1.3.2.2-1.

Table 6.1.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

#### 6.1.3.2.3 Resource Standard Methods

#### 6.1.3.2.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.2.3.1-1.

Table 6.1.3.2.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported- features	SupportedFeat ures	0	01	see 3GPP TS 29.500 [4] clause 6.6
plmn-id	Plmnld	0	01	PLMN identity of the PLMN serving the UE

If "plmn-id" is included, UDM shall return the Subscribed S-NSSAIs which the UE is subscribed to use in the PLMN identified by "plmn-id".

If "plmn-id" is not included, UDM shall return the Subscribed S-NSSAIs for HPLMN.

This method shall support the request data structures specified in table 6.1.3.2.3.1-2 and the response data structures and response codes specified in table 6.1.3.2.3.1-3.

Table 6.1.3.2.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.2.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
Nssai	М	1	200 OK	Upon success, a response body containing the NSSAI shall be returned.	
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND - DATA_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

Table 6.1.3.2.3.1-4: Headers supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
If-None-Match	string	0	01	Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.2
If-Modified-Since	string	0	01	Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.3

Table 6.1.3.2.3.1-5: Headers supported by the 200 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Cache-Control	string	0		Cache-Control containing max-age, as described in IETF RFC 7234 [26], clause 5.2
ETag	string	0		Entity Tag, containing a strong validator, as described in IETF RFC 7232 [25], clause 2.3
Last-Modified	string	0	01	Timestamp for last modification of the resource, as described in IETF RFC 7232 [25], clause 2.2

# 6.1.3.3 Resource: SdmSubscriptions (Collection)

# 6.1.3.3.1 Description

This resource is used to represent subscriptions to notifications.

The UDM will only recognize subscribed DNNs in this resource so for instance, if the SMF receives SessionManagementSubscriptionData for the Wildcard DNN, the SMF shall include the wildcard DNN in SdmSubscription. Any request for non-subscribed DNN will be rejected with "404 Not Found".

# 6.1.3.3.2 Resource Definition

 $Resource\ URI:\ \{apiRoot\}/nudm-sdm/<apiVersion>/\{ueId\}/sdm-subscriptions$ 

This resource shall support the resource URI variables defined in table 6.1.3.3.2-1.

Table 6.1.3.3.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
ueld		Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) or Generic Public Subscription Identifier (see 3GPP TS 23.501 [2] clause 5.9.8)
		pattern: See pattern of type VarUeld in 3GPP TS 29.571 [7]

#### 6.1.3.3.3 Resource Standard Methods

#### 6.1.3.3.3.1 POST

This method shall support the URI query parameters specified in table 6.1.3.3.3.1-1.

Table 6.1.3.3.3.1-1: URI query parameters supported by the POST method on this resource

	Name	Data type	Р	Cardinality	Description
n/	a				

This method shall support the request data structures specified in table 6.1.3.3.3.1-2 and the response data structures and response codes specified in table 6.1.3.3.3.1-3.

Table 6.1.3.3.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	Р	Cardinality	Description
SdmSubscription	М	1	The subscription that is to be created.

Table 6.1.3.3.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
SdmSubscription	M	1	201 Created	Upon success, a response body containing a representation of the created Individual subscription resource shall be returned including the accepted values, e.g. in case of partial success UDM shall return the list of monitores resource Uri successfully subscribed  The HTTP response shall include a "Location" HTTP header that contains the resource URI of the created resource. When stateless UDM is deployed, the stateless UDM may use an FQDN identifying the UDM group to which the UDM belongs as the host part of the resource URI.
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors:: - USER_NOT_FOUND
ProblemDetails	0	01	501 Not Implemente d	The "cause" attribute may be used to indicate one of the following application errors: - UNSUPPORTED_RESOURCE_URI  This response shall not be cached.

NOTE: In the scenario of stateless UDM deployment, it is assumed that stateless UDMs are organized into several UDM groups, and for each UDM group an FQDN can be allocated.

Table 6.1.3.3.3.1-4: Headers supported by the 201 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	M		Contains the URI of the newly created resource, according to the structure: {apiRoot}/nudm-sdm/ <apiversion>/{supi}/sdm-subscriptions/{subscriptionId}</apiversion>

# 6.1.3.4 Resource: Individual subscription (Document)

# 6.1.3.4.1 Description

This resource is used to represent an individual subscription to notifications.

## 6.1.3.4.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{ueId}/sdm-subscriptions/{subscriptionId}

This resource shall support the resource URI variables defined in table 6.1.3.4.2-1.

Table 6.1.3.4.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
ueld		Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) or Generic Public Subscription Identifier (see 3GPP TS 23.501 [2] clause 5.9.8) pattern: See pattern of type VarUeld in 3GPP TS 29.571 [7]
subscriptionId	string	The subscriptionId identifies an individual subscription to notifications.

#### 6.1.3.4.3 Resource Standard Methods

### 6.1.3.4.3.1 DELETE

This method shall support the URI query parameters specified in table 6.1.3.4.3.1-1.

Table 6.1.3.4.3.1-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.1.3.4.3.1-2 and the response data structures and response codes specified in table 6.1.3.4.3.1-3.

Table 6.1.3.4.3.1-2: Data structures supported by the Delete Request Body on this resource

Data type	Р	Cardinality	Description
n/a			The request body shall be empty.

Table 6.1.3.4.3.1-3: Data structures supported by the DELETE Response Body on this resource

Data type	Р	Cardinality	Respons	Description			
			е				
			codes				
n/a			204 No	Upon success, an empty response body shall be returned.			
			Content				
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the following			
			Found	application errors:			
				- ÜSER_NOT_FOUND			
				- SUBSCRIPTION_NOT_FOUND, see 3GPP TS 29.500 [4]			
				table 5.2.7.2-1.			
NOTE: In addition	NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.						

#### 6.1.3.4.3.2 PATCH

This method shall support the URI query parameters specified in table 6.1.3.4.3.2-1.

Table 6.1.3.4.3.2-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	Р	Cardinality	Description
supported-	SupportedFeat	0	01	see 3GPP TS 29.500 [4] clause 6.6
features	ures			See 3011   13 29.300 [4] Clause 0.0

This method shall support the request data structures specified in table 6.1.3.4.3.2-2 and the response data structures and response codes specified in table 6.1.3.4.3.2-3.

Table 6.1.3.4.3.2-2: Data structures supported by the PATCH Request Body on this resource

Data type	Р	Cardinality	Description
SdmSubsModifica	М	1	The modification Instruction
tion			

Table 6.1.3.4.3.2-3: Data structures supported by the PATCH Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
SdmSubscription	M	1	200 OK	Upon success, the modified sdmSubscription shall be returned including the accepted values, e.g. in case of partial success UDM shall return the list of monitores resource Uri successfully subscribed. (NOTE 2)
n/a			204 No Content	Upon success, an empty response body shall be returned. (NOTE 2)
PatchResult	М	1	200 OK	Upon success, the execution report is returned. (NOTE 2)
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND - SUBSCRIPTION_NOT_FOUND, see 3GPP TS 29.500 [4] table 5.2.7.2-1.
ProblemDetails	0	01	403 Forbidden	One or more attributes are not allowed to be modified.  The "cause" attribute may be used to indicate one of the following application errors:  - MODIFICATION_NOT_ALLOWED, see 3GPP TS 29.500 [4] table 5.2.7.2-1.

NOTE 1: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

NOTE 2: If the NF service consumer has not included in the supported-feature query parameter the "PatchReport" feature number, the UDM responds with SdmSubscription. If the NF service consumer has included in the supported-feature query parameter the "PatchReport" feature number, the UDM shall respond with 204 No Content response indicating that all the modification instructions in the PATCH request have been implemented or with PatchResult indicating that some of the modification instructions in the PATCH request have been discarded.

# 6.1.3.5 Resource: AccessAndMobilitySubscriptionData (Document)

## 6.1.3.5.1 Description

This resource represents the subscribed Access and Mobility Data for a SUPI. It is queried by the AMF after registering.

# 6.1.3.5.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/am-data

This resource shall support the resource URI variables defined in table 6.1.3.5.2-1.

Table 6.1.3.5.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2)
		pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

## 6.1.3.5.3 Resource Standard Methods

#### 6.1.3.5.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.5.3.1-1.

Table 6.1.3.5.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6
plmn-id	PlmnId	0	01	PLMN identity of the PLMN serving the UE

If "plmn-id" is included, UDM shall return the Access and Mobility Data for the SUPI associated to the PLMN identified by "plmn-id".

If "plmn-id" is not included, UDM shall return the Access and Mobility Data for the SUPI associated to the HPLMN.

This method shall support the request data structures specified in table 6.1.3.5.3.1-2 and the response data structures and response codes specified in table 6.1.3.5.3.1-3.

Table 6.1.3.5.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.5.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
AccessAndMobility	М	1	200 OK	Upon success, a response body containing the Access and	
SubscriptionData				Mobility Subscription Data shall be returned.	
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the	
			Found	following application errors:	
				- USER_NOT_FOUND	
				- DATA_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

Table 6.1.3.5.3.1-4: Headers supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
If-None-Match	string	0	01	Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.2
If-Modified-Since	string	0	01	Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.3

Table 6.1.3.5.3.1-5: Headers supported by the 200 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Cache-Control	string	0	01	Cache-Control containing max-age, as described in IETF RFC
				7234 [26], clause 5.2
ETag	string	0	01	Entity Tag, containing a strong validator, as described in IETF
				RFC 7232 [25], clause 2.3
Last-Modified	string	0	01	Timestamp for last modification of the resource, as described
				in IETF RFC 7232 [25], clause 2.2

# 6.1.3.5.4 Resource Custom Operations

#### 6.1.3.5.4.1 Overview

Table 6.1.3.5.4.1-1: Custom operations

Operation Name	Custom operation URI	Mapped HTTP method	Description
update-sor	/{supi}/am-data/update-sor		Trigger the update of Steering of Roaming information at the UE

## 6.1.3.5.4.2 Operation: update-sor

### 6.1.3.5.4.2.1 Description

When a UE performs initial registration or emergency registration at an AMF (which already has AccessAndMobilitySubscriptionData stored) within a VPLMN, and the sorUpdateIndicatorList is present in AccessAndMobilitySubscriptionData and contains the corresponding registration type, the AMF shall make use of this operation to trigger the HPLMN to update steering of roaming information for the UE.

#### 6.1.3.5.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.1.3.5.4.2.2-1 and the response data structure and response codes specified in table 6.1.3.5.4.2.2-2.

Table 6.1.3.5.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	Р	Cardinality	Description
SorUpdateInfo	M	1	Contains the ID of the VPLMN

Table 6.1.3.5.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
SorInfo	М	1	200 OK	Upon success, a response body containing the updated Steering Of Roaming information shall be returned.	
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND	
NOTE: The manadatory HTTP error status code for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.					

# 6.1.3.6 Resource: SmfSelectionSubscriptionData (Document)

# 6.1.3.6.1 Description

This resource represents the subscribed SMF Selection Data for a SUPI. It is queried by the AMF after registering.

#### 6.1.3.6.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/smf-select-data

This resource shall support the resource URI variables defined in table 6.1.3.6.2-1.

Table 6.1.3.6.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2)
		pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

#### 6.1.3.6.3 Resource Standard Methods

6.1.3.6.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.6.3.1-1.

Table 6.1.3.6.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeature s	0	01	see 3GPP TS 29.500 [4] clause 6.6
plmn-id	Plmnld	0	01	PLMN identity of the PLMN serving the UE

If "plmn-id" is included, UDM shall return the SMF Selection Subscription Data for the SUPI associated to the PLMN identified by "plmn-id".

If "plmn-id" is not included, UDM shall return the SMF Selection Subscription Data for the SUPI associated to the HPLMN.

This method shall support the request data structures specified in table 6.1.3.6.3.1-2 and the response data structures and response codes specified in table 6.1.3.6.3.1-3.

Table 6.1.3.6.3.1-2: Data structures supported by the GET Request Body on this resource

Ī	Data type	Р	Cardinality	Description
I	n/a			

Table 6.1.3.6.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response	Description	
			codes		
SmfSelectionSubsc riptionData	M	1	200 OK	Upon success, a response body containing the SMF Selection Subscription Data shall be returned.	
ProblemDetails	0	01		The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND - DATA_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

Table 6.1.3.6.3.1-4: Headers supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
If-None-Match	string	0		Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.2
If-Modified-Since	string	0	01	Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.3

Table 6.1.3.6.3.1-5: Headers supported by the 200 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Cache-Control	string	0	01	Cache-Control containing max-age, as described in IETF RFC 7234 [26], clause 5.2
ETag	string	0		Entity Tag, containing a strong validator, as described in IETF RFC 7232 [25], clause 2.3
Last-Modified	string	0	01	Timestamp for last modification of the resource, as described in IETF RFC 7232 [25], clause 2.2

# 6.1.3.7 Resource: UeContextInSmfData (Document)

# 6.1.3.7.1 Description

This resource represents the allocated SMFs for a SUPI. It is queried by the AMF after registering.

## 6.1.3.7.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/ue-context-in-smf-data

This resource shall support the resource URI variables defined in table 6.1.3.7.2-1.

Table 6.1.3.7.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

# 6.1.3.7.3 Resource Standard Methods

#### 6.1.3.7.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.7.3.1-1.

Table 6.1.3.7.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.1.3.7.3.1-2 and the response data structures and response codes specified in table 6.1.3.7.3.1-3.

Table 6.1.3.7.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.7.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response	Description
			codes	
UeContextInSmfDa	М	1	200 OK	Upon success, a response body containing the
ta				UeContextInSmfData shall be returned.
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the
			Found	following application errors:
				- USER_NOT_FOUND
				- DATA_NOT_FOUND
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.				

# 6.1.3.8 Resource: SessionManagementSubscriptionData (Document)

# 6.1.3.8.1 Description

This resource represents the Session Management subscription data for a SUPI. It is queried by the SMF during session setup, using query parameters representing the selected network slice and the DNN. The SMF is responsible for enforcing the user session management subscription data.

UDM will only recognize subscribed DNNs in this resource so for instance, in case SMF receives indication from AMF that the DNN was authorized based on the wildcard APN in the Selection Mode Value, SMF shall include the wildcard DNN in the query parameter and SMF will receive SessionManagementSubscriptionData for the Wildcard DNN. Any request for non-subscribed DNN will be rejected with "404 Not Found".

This resource is also queried by the PGW-C+SMF during PDN connection establishment in the EPC, to select the S-NSSAI for the APN/DNN of the PDN connection, see 3GPP TS 23.502 [3] clause 4.11.0a.5.

NOTE: The PGW-C+SMF shall also retrieve the Nssai resource from UDM, to avoid selection a slice that is subject to Network Slice-Specific Authentication and Authorization (see clause 6.1.3.2.1).

# 6.1.3.8.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/sm-data

This resource shall support the resource URI variables defined in table 6.1.3.8.2-1.

Table 6.1.3.8.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
apiVersion	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2)
		pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

# 6.1.3.8.3 Resource Standard Methods

### 6.1.3.8.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.8.3.1-1.

Table 6.1.3.8.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6
single-nssai	Snssai	0	01	When present without Slice Differentiator (sd), all slices identified by the given Slice/Service Type (sst) and any sd value (if any) shall be considered matching the query parameter.
dnn	Dnn	0	01	The DNN shall be the DNN Network Identifier only.
plmn-id	Plmnld	0	01	PLMN identity of the PLMN serving the UE

JSON objects (such as Snssai, PlmnId...) shall be included directly as part of the URI query parameters by specifying in the OpenAPI file that the "Content-Type" of such parameters is "application/json".

If "singleNssai" is not included, and "dnn" is not included, UDM shall return all DNN configurations for all network slice(s).

If "singleNssai" is included, and "dnn" is not included, UDM shall return all DNN configurations for the requested network slice identified by "singleNssai".

If "singleNssai" is not included, and "dnn" is included, UDM shall return all DNN configurations identified by "dnn" for all network slices where such DNN is available.

If "singleNssai" is included, and "dnn" is included, UDM shall return the DNN configuration identified by "dnn", if such DNN is available in the network slice identified by "singleNssai".

For all the combinations about the inclusion of "dnn" and "singleNssai" as URI query parameters, if "plmn-id" is included, UDM shall return the configurations for the DNN and network slices associated to the PLMN identified by "plmn-id". Otherwise (i.e. if "plmn-id" is not included), UDM shall return the configurations for the DNN and network slices associated to the HPLMN.

This method shall support the request data structures specified in table 6.1.3.8.3.1-2 and the response data structures and response codes specified in table 6.1.3.8.3.1-3.

Table 6.1.3.8.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.8.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response	Description
			codes	
array(SessionMa nagementSubscri ptionData)	М	1N	200 OK	Upon success, a response body containing the Session Management Subscription data shall be returned.
1				
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors:  - USER_NOT_FOUND  - DATA_NOT_FOUND
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.				

Table 6.1.3.8.3.1-4: Headers supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
If-None-Match	string	0		Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.2
If-Modified-Since	string	0	01	Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.3

Table 6.1.3.8.3.1-5: Headers supported by the 200 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Cache-Control	string	0	01	Cache-Control containing max-age, as described in IETF RFC 7234 [26], clause 5.2
ETag	string	0		Entity Tag, containing a strong validator, as described in IETF RFC 7232 [25], clause 2.3
Last-Modified	string	0	01	Timestamp for last modification of the resource, as described in IETF RFC 7232 [25], clause 2.2

# 6.1.3.9 Resource: SMSSubscriptionData (Document)

# 6.1.3.9.1 Description

This resource represents the subscribed SMS Subscription Data for a SUPI. It is queried by the AMF after registering.

## 6.1.3.9.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/sms-data

This resource shall support the resource URI variables defined in table 6.1.3.9.2-1.

Table 6.1.3.9.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	•	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2)
		pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

# 6.1.3.9.3 Resource Standard Methods

#### 6.1.3.9.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.9.3.1-1.

Table 6.1.3.9.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
plmn-id	Plmnld	С	01	if absent, H-PLMN ID is used as default
supported- features	SupportedFeat ures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.1.3.9.3.1-2 and the response data structures and response codes specified in table 6.1.3.9.3.1-3.

Table 6.1.3.9.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.9.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
SmsSubscriptionDat	М	1	200 OK	Upon success, a response body containing the SMS
a				Subscription Data shall be returned.
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the
			Found	following application errors:
				- USER_NOT_FOUND
				- DATA_NOT_FOUND
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.				

Table 6.1.3.9.3.1-4: Headers supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
If-None-Match	string	0	01	Validator for conditional requests, as described in IETF RFC
				7232 [25], clause 3.2
If-Modified-Since	string	0	01	Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.3

Table 6.1.3.9.3.1-5: Headers supported by the 200 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Cache-Control	string	0	01	Cache-Control containing max-age, as described in IETF RFC 7234 [26], clause 5.2
ETag	string	0		Entity Tag, containing a strong validator, as described in IETF RFC 7232 [25], clause 2.3
Last-Modified	string	0	01	Timestamp for last modification of the resource, as described in IETF RFC 7232 [25], clause 2.2

# 6.1.3.10 Resource: SMSManagementSubscriptionData (Document)

# 6.1.3.10.1 Description

This resource represents the subscribed SMS Management Data for a SUPI. It is queried by the SMSF after registering.

## 6.1.3.10.2 Resource Definition

 $Resource\ URI:\ \{apiRoot\}/nudm-sdm/<apiVersion>/\{supi\}/sms-mng-data$ 

This resource shall support the resource URI variables defined in table 6.1.3.10.2-1.

Table 6.1.3.10.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2)

## 6.1.3.10.3 Resource Standard Methods

#### 6.1.3.10.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.10.3.1-1.

Table 6.1.3.10.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
plmn-id	Plmnld	O	01	if absent, H-PLMN ID is used as default
· '.'	SupportedFeat ures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.1.3.10.3.1-2 and the response data structures and response codes specified in table 6.1.3.10.3.1-3.

Table 6.1.3.10.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.10.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
SmsManagementS	M	1	200 OK	Upon success, a response body containing the SMS
ubscriptionData				Management Subscription Data shall be returned.
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the
			Found	following application errors:
				- USER_NOT_FOUND
				- DATA_NOT_FOUND
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.				

Table 6.1.3.10.3.1-4: Headers supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
If-None-Match	string	0	01	Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.2
If-Modified-Since	string	0	01	Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.3

Table 6.1.3.10.3.1-5: Headers supported by the 200 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Cache-Control	string	0		Cache-Control containing max-age, as described in IETF RFC
				7234 [26], clause 5.2
ETag	string	0	01	Entity Tag, containing a strong validator, as described in IETF
	_			RFC 7232 [25], clause 2.3
Last-Modified	string	0	01	Timestamp for last modification of the resource, as described
				in IETF RFC 7232 [25], clause 2.2

# 6.1.3.11 Resource: Supi (Document)

# 6.1.3.11.1 Description

This resource represents the subscription profile of the subscriber identified by a given SUPI.

#### 6.1.3.11.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}

This resource shall support the resource URI variables defined in table 6.1.3.11.2-1.

Table 6.1.3.11.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

#### 6.1.3.11.3 Resource Standard Methods

#### 6.1.3.11.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.11.3.1-1.

NOTE: The retrieval of these data sets can also be achieved by sending individual GET requests to the corresponding sub-resources under the {supi} resource. When multiple data sets need to be retrieved by the NF Service consumer, it is recommended to use a single GET request with query parameters rather than issuing multiple GET requests.

Table 6.1.3.11.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
dataset-names	DatasetNames	М	1	Contains names of the data sets that are required to retrieve.
plmn-id	Plmnld	С	01	If absent, H-PLMN ID is used as default. This IE is only used for data sets whose DataSetNames are listed below: "AM" "SMF_SEL" "SMS_SUB" "SM" "TRACE" "SMS_MNG"
supported- features	SupportedFeat ures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.1.3.11.3.1-2 and the response data structures and response codes specified in table 6.1.3.11.3.1-3.

Table 6.1.3.11.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.11.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response	Description	
			codes		
SubscriptionData	М	1	200 OK	Upon success, a response body containing the requested data	
Sets				sets shall be returned.	
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the	
			Found	following application errors:	
				- USER_NOT_FOUND	
				- DATA_NOT_FOUND	
NOTE: The manadatory HTTP error status code for the GET method listed in Table 5.2.7.1-1 of					
3GPP TS 29.500 [4] also apply.					

Table 6.1.3.11.3.1-4: Headers supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
If-None-Match	string	0		Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.2
If-Modified-Since	string	0	01	Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.3

Table 6.1.3.11.3.1-5: Headers supported by the 200 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Cache-Control	string	0	01	Cache-Control containing max-age, as described in IETF RFC 7234 [26], clause 5.2
ETag	string	0		Entity Tag, containing a strong validator, as described in IETF RFC 7232 [25], clause 2.3
Last-Modified	string	0	01	Timestamp for last modification of the resource, as described in IETF RFC 7232 [25], clause 2.2

# 6.1.3.12 Resource: IdTranslationResult (Document)

# 6.1.3.12.1 Description

This resource represents the SUPI. It is queried by the NEF for GPSI to SUPI translation. See 3GPP TS 23.502 [3] clause 4.13.2.2.

#### 6.1.3.12.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{ueId}/id-translation-result

This resource shall support the resource URI variables defined in table 6.1.3.12.2-1.

Table 6.1.3.12.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
ueld		Represents the Generic Public Subscription Identifier (see 3GPP TS 23.501 [2] clause 5.9.8) or Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type VarUeld in 3GPP TS 29.571 [7]

# 6.1.3.12.3 Resource Standard Methods

# 6.1.3.12.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.12.3.1-1.

Table 6.1.3.12.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported- features	SupportedFeat ures	0	01	see 3GPP TS 29.500 [4] clause 6.6
app-port-id	AppPortId	С		If ueld is a SUPI in Resource URI variables, this shall be present and indicates Application port identity, see 3GPP TS 23.501 [2] clause 4.4.7

This method shall support the request data structures specified in table 6.1.3.12.3.1-2 and the response data structures and response codes specified in table 6.1.3.12.3.1-3.

Table 6.1.3.12.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.12.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
IdTranslationRes ult	М	1	200 OK	Upon success, a response body containing the SUPI and optionally the MSISDN shall be returned.	
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND - DATA_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

Table 6.1.3.12.3.1-4: Headers supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
If-None-Match	string	0	01	Validator for conditional requests, as described in IETF RFC
				7232 [25], clause 3.2
If-Modified-Since	string	0	01	Validator for conditional requests, as described in IETF RFC
				7232 [25], clause 3.3

Table 6.1.3.12.3.1-5: Headers supported by the 200 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Cache-Control	string	0	01	Cache-Control containing max-age, as described in IETF RFC 7234 [26], clause 5.2
ETag	string	0		Entity Tag, containing a strong validator, as described in IETF RFC 7232 [25], clause 2.3
Last-Modified	string	0	01	Timestamp for last modification of the resource, as described in IETF RFC 7232 [25], clause 2.2

# 6.1.3.13 Resource: SorAck (Document)

# 6.1.3.13.1 Description

This resource represents the acknowledgement of the SoR for a SUPI.

## 6.1.3.13.2 Resource Definition

 $Resource\ URI:\ \{apiRoot\}/nudm-sdm/<apiVersion>/\{supi\}/am-data/sor-ack$ 

This resource shall support the resource URI variables defined in table 6.1.3.13.2-1.

Table 6.1.3.13.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

#### 6.1.3.13.3 Resource Standard Methods

6.1.3.13.3.1 PUT

This method shall support the URI query parameters specified in table 6.1.3.13.3.1-1.

Table 6.1.3.13.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.1.3.13.3.1-2 and the response data structures and response codes specified in table 6.1.3.13.3.1-3.

Table 6.1.3.13.3.1-2: Data structures supported by the PUT Request Body on this resource

Data type	Р	Cardinality	Description
AcknowledgeInfo	М	1	Contains the SOR-MAC-lue received from the UE.

Table 6.1.3.13.3.1-3: Data structures supported by the PUT Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
n/a			204 No	Successful receiving the SorXmaclue in the Request.	
			Content		
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the	
			Found	following application errors:	
- USER_NOT_FOUND					
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

# 6.1.3.14 Resource: TraceData (Document)

#### 6.1.3.14.1 Description

This resource represents the trace configuration data for a SUPI. It is queried by the AMF and SMF after registering.

## 6.1.3.14.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/trace-data

This resource shall support the resource URI variables defined in table 6.1.3.14.2-1.

Table 6.1.3.14.2-1: Resource URI variables for this resource

Name	Data type	Definition				
apiRoot	string	See clause 6.1.1				
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]				

## 6.1.3.14.3 Resource Standard Methods

### 6.1.3.14.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.14.3.1-1.

Table 6.1.3.14.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6
plmn-id	PlmnId	0	01	PLMN identity of the PLMN serving the UE

If "plmn-id" is included, UDM shall return the Trace Data for the SUPI associated to the PLMN identified by "plmn-id".

If "plmn-id" is not included, UDM shall return the Trace Data for the SUPI associated to the HPLMN.

This method shall support the request data structures specified in table 6.1.3.14.3.1-2 and the response data structures and response codes specified in table 6.1.3.14.3.1-3.

Table 6.1.3.14.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.14.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
TraceDataRespons e	М	1	200 OK	Upon success, a response body containing the Trace Data shall be returned.	
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND - DATA_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

Table 6.1.3.14.3.1-4: Headers supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
If-None-Match	string	0	01	Validator for conditional requests, as described in IETF RFC
				7232 [25], clause 3.2
If-Modified-Since	string	0	01	Validator for conditional requests, as described in IETF RFC
				7232 [25], clause 3.3

Table 6.1.3.14.3.1-5: Headers supported by the 200 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Cache-Control	string	0		Cache-Control containing max-age, as described in IETF RFC 7234 [26], clause 5.2
ETag	string	0		Entity Tag, containing a strong validator, as described in IETF RFC 7232 [25], clause 2.3
Last-Modified	string	0	01	Timestamp for last modification of the resource, as described in IETF RFC 7232 [25], clause 2.2

# 6.1.3.15 Resource: SharedData (Collection)

# 6.1.3.15.1 Description

This resource represents the collection of data that can be shared by multiple UEs.

# 6.1.3.15.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/shared-data

This resource shall support the resource URI variables defined in table 6.1.3.15.2-1.

Table 6.1.3.15.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1

## 6.1.3.15.3 Resource Standard Methods

6.1.3.15.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.15.3.1-1.

Table 6.1.3.15.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
shared-data-ids	array(SharedD atald)	М	1N	Contains unique items

This method shall support the request data structures specified in table 6.1.3.15.3.1-2 and the response data structures and response codes specified in table 6.1.3.15.3.1-3.

Table 6.1.3.15.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.15.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response	Description		
			codes			
array(SharedDat	М	1N	200 OK	Upon success, a response body containing a list of		
a)				SharedData shall be returned.		
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the		
			Found	following application errors:		
- DATA_NOT_FOUND						
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.						

Table 6.1.3.15.3.1-4: Headers supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
If-None-Match	string	0		Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.2
If-Modified-Since	string	0	01	Validator for conditional requests, as described in IETF RFC 7232 [25], clause 3.3

Table 6.1.3.15.3.1-5: Headers supported by the 200 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Cache-Control	string	0	01	Cache-Control containing max-age, as described in IETF RFC 7234 [26], clause 5.2
ETag	string	0		Entity Tag, containing a strong validator, as described in IETF RFC 7232 [25], clause 2.3
Last-Modified	string	0	01	Timestamp for last modification of the resource, as described in IETF RFC 7232 [25], clause 2.2

# 6.1.3.16 Resource: SharedDataSubscriptions (Collection)

# 6.1.3.16.1 Description

This resource is used to represent subscriptions to notifications for shared data.

## 6.1.3.16.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/shared-data-subscriptions

This resource shall support the resource URI variables defined in table 6.1.3.16.2-1.

Table 6.1.3.16.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1

#### 6.1.3.16.3 Resource Standard Methods

# 6.1.3.16.3.1 POST

This method shall support the URI query parameters specified in table 6.1.3.16.3.1-1.

Table 6.1.3.16.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.1.3.16.3.1-2 and the response data structures and response codes specified in table 6.1.3.16.3.1-3.

Table 6.1.3.16.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	Р	Cardinality	Description
SdmSubscription	М	1	The subscription that is to be created.

Table 6.1.3.16.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
SdmSubscription	М	1	201 Created	Upon success, a response body containing a representation of the created Individual subscription resource shall be returned.
				The HTTP response shall include a "Location" HTTP header that contains the resource URI of the created resource. When stateless UDM is deployed, the stateless UDM shall use the FQDN identifying the UDM set to which the UDM belongs as the host part of the resource URI.
ProblemDetails	0	01	501 Not Implemente d	The "cause" attribute may be used to indicate one of the following application errors: - UNSUPPORTED_RESOURCE_URI  This response shall not be cached.
NOTE: In additi	on co	mmon data stru	ctures as liste	ed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

NOTE: In the scenario of stateless UDM deployment, it is assumed that stateless UDMs are organized into several UDM sets, and each UDM set is allocated an FQDN.

Table 6.1.3.16.3.1-4: Headers supported by the 201 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	М		Contains the URI of the newly created resource, according to the structure: {apiRoot}/nudm-sdm/ <apiversion>/shared-data-</apiversion>
				subscriptions/{subscriptionId}

# 6.1.3.17 Resource: Individual subscription (Document)

# 6.1.3.17.1 Description

This resource is used to represent an individual subscription to notifications for shared data.

#### 6.1.3.17.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/shared-data-subscriptions/{subscriptionId}

This resource shall support the resource URI variables defined in table 6.1.3.17.2-1.

Table 6.1.3.17.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
subscriptionId	strina	The subscriptionId identifies an individual subscription to notifications.

#### 6.1.3.17.3 Resource Standard Methods

#### 6.1.3.17.3.1 DELETE

This method shall support the URI query parameters specified in table 6.1.3.17.3.1-1.

Table 6.1.3.17.3.1-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.1.3.17.3.1-2 and the response data structures and response codes specified in table 6.1.3.17.3.1-3.

Table 6.1.3.17.3.1-2: Data structures supported by the Delete Request Body on this resource

Data type	Р	Cardinality	Description
n/a			The request body shall be empty.

Table 6.1.3.17.3.1-3: Data structures supported by the DELETE Response Body on this resource

Data type	Р	Cardinality	Response	Description		
			codes			
n/a			204 No Content	Upon success, an empty response body shall be returned.		
ProblemDetails	0	01	404 Not Found	The resource corresponding to the SubscriptionId can't be found.		
				The "cause" attribute may be used to indicate one of the following application errors:: - SUBSCRIPTION_NOT_FOUND, see 3GPP TS 29.500 [4] table 5.2.7.2-1.		
NOTE: In addition						

### 6.1.3.17.3.2 PATCH

This method shall support the URI query parameters specified in table 6.1.3.17.3.2-1.

Table 6.1.3.17.3.2-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	Р	Cardinality	Description
supported-	SupportedFeat	0	01	see 3GPP TS 29.500 [4] clause 6.6
features	ures			See 3GFF 13 29.300 [4] clause 0.0

This method shall support the request data structures specified in table 6.1.3.17.3.2-2 and the response data structures and response codes specified in table 6.1.3.17.3.2-3.

Table 6.1.3.17.3.2-2: Data structures supported by the PATCH Request Body on this resource

Data type	Р	Cardinality	Description
SdmSubsModifica	М	1	The modification Instruction
tion			

Table 6.1.3.17.3.2-3: Data structures supported by the PATCH Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
SdmSubscription	М	1	200 OK	Upon success, the modified sdmSubscription shall be returned. (NOTE 2)
n/a			204 No Content	Upon success, an empty response body shall be returned. (NOTE 2)
PatchResult	М	1	200 OK	Upon success, the execution report is returned. (NOTE 2)
ProblemDetails	0	01	404 Not Found	The resource corresponding to the SubscriptionId can't be found.  The "cause" attribute may be used to indicate one of the following application errors: - SUBSCRIPTION_NOT_FOUND, see 3GPP TS 29.500 [4] table 5.2.7.2-1.
ProblemDetails	0	01	403 Forbidden	One or more attributes are not allowed to be modified.  The "cause" attribute may be used to indicate one of the following application errors:  - MODIFICATION_NOT_ALLOWED, see 3GPP TS 29.500 [4] table 5.2.7.2-1.

NOTE 1: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

NOTE 2: If the NF service consumer has not included in the supported-features query parameter the "PatchReport" feature number, the UDM responds with SdmSubscription. If the NF service consumer has included in the supported-features query parameter the "PatchReport" feature number, the UDM shall respond with 204 No Content response indicating that all the modification instructions in the PATCH request have been implemented or with PatchResult indicating that some of the modification instructions in the PATCH request have been discarded.

# 6.1.3.18 Resource: UeContextInSmsfData (Document)

## 6.1.3.18.1 Description

This resource represents the allocated SMSFs for a SUPI.

# 6.1.3.18.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/ue-context-in-smsf-data

This resource shall support the resource URI variables defined in table 6.1.3.18.2-1.

Table 6.1.3.18.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

#### 6.1.3.18.3 Resource Standard Methods

### 6.1.3.18.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.18.3.1-1.

Table 6.1.3.18.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	0 1	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.1.3.18.3.1-2 and the response data structures and response codes specified in table 6.1.3.18.3.1-3.

Table 6.1.3.18.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.18.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
UeContextInSmsf Data	М	1	200 OK	Upon success, a response body containing the UeContextInSmsfData shall be returned.
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND - DATA_NOT_FOUND
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.				

# 6.1.3.19 Resource: UpuAck (Document)

# 6.1.3.19.1 Description

This resource represents the acknowledgement of UE parameters update for a SUPI.

## 6.1.3.19.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/am-data/upu-ack

This resource shall support the resource URI variables defined in table 6.1.3.19.2-1.

Table 6.1.3.19.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

# 6.1.3.19.3 Resource Standard Methods

#### 6.1.3.19.3.1 PUT

This method shall support the URI query parameters specified in table 6.1.3.19.3.1-1.

Table 6.1.3.19.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.1.3.19.3.1-2 and the response data structures and response codes specified in table 6.1.3.19.3.1-3.

Table 6.1.3.19.3.1-2: Data structures supported by the PUT Request Body on this resource

Data type	Р	Cardinality	Description
AcknowledgeInfo	М		Contains the UPU-MAC-lue received from the UE and the provisioning time stamp as received within UpuInfo.

Table 6.1.3.19.3.1-3: Data structures supported by the PUT Response Body on this resource

Data type	Р	Cardinality	Response codes	Description		
n/a			204 No Content	Successful receiving the UpuXmaclue in the Request.		
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND		
NOTE: The manadatory HTTP error status code for the PUT method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply.						

# 6.1.3.20 Resource: GroupIdentifiers (Document)

### 6.1.3.20.1 Description

This resource represents the Group Identifiers handled by UDM/UDR. It is queried by the NEF or GMLC for translation between External and Internal Group Identifiers or query the UE identifiers that belong to the provided External or Internal Group Identifier.

## 6.1.3.20.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/group-data/group-identifiers

This resource shall support the resource URI variables defined in table 6.1.3.20.2-1.

Table 6.1.3.20.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1

## 6.1.3.20.3 Resource Standard Methods

### 6.1.3.20.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.20.3.1-1.

Table 6.1.3.20.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description		
supported-	SupportedFeat	0	01	see 3GPP TS 29.500 [4] clause 6.6		
features	ures			See 3GFF 13 29.500 [4] clause 6.6		
ext-groud-id	ExtGroupId	С	01	External Group ID		
int-group-id	GroupId	С	01	Internal Group ID		
ue-id-ind	boolean	С	01	Indication whether UE identifiers are required or not.		
				When present, it shall be set as following:		
				- true: UE identifiers are required		
				- false (default): UE identifiers are not required		
NOTE: Either ext-group-id or int-group-id shall be present in the request.						

Either the ext-group-id or the int-group-id shall be present in the request.

This method shall support the request data structures specified in table 6.1.3.20.3.1-2 and the response data structures and response codes specified in table 6.1.3.20.3.1-3.

Table 6.1.3.20.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.20.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description		
GroupIdentifiers	М	1	200 OK	Upon success, a response body containing the group identifier(s) shall be returned.		
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - GROUP_IDENTIFIER_NOT_FOUND		
NOTE: In addition, common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.						

Table 6.1.3.20.3.1-4: Headers supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
If-None-Match	string	0	01	Validator for conditional requests, as described in IETF RFC
				7232 [25], clause 3.2
If-Modified-Since	string	0	01	Validator for conditional requests, as described in IETF RFC
				7232 [25], clause 3.3

Table 6.1.3.20.3.1-5: Headers supported by the 200 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Cache-Control	string	0	01	Cache-Control containing max-age, as described in IETF RFC 7234 [26], clause 5.2
ETag	string	0		Entity Tag, containing a strong validator, as described in IETF RFC 7232 [25], clause 2.3
Last-Modified	string	0	01	Timestamp for last modification of the resource, as described in IETF RFC 7232 [25], clause 2.2

# 6.1.3.21 Resource: SnssaisAck (Document)

## 6.1.3.21.1 Description

This resource represents the acknowledgement of UE for subscribed S-NSSAIs update for a SUPI.

### 6.1.3.21.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/am-data/subscribed-snssais-ack

This resource shall support the resource URI variables defined in table 6.1.3.21.2-1.

Table 6.1.3.21.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

#### 6.1.3.21.3 Resource Standard Methods

#### 6.1.3.21.3.1 PUT

This method shall support the URI query parameters specified in table 6.1.3.21.3.1-1.

Table 6.1.3.21.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.1.3.21.3.1-2 and the response data structures and response codes specified in table 6.1.3.21.3.1-3.

Table 6.1.3.21.3.1-2: Data structures supported by the PUT Request Body on this resource

Data type	Р	Cardinality	Description
AcknowledgeInfo	М	1	Contains the provisioning time stamp as received within the Nssai.

Table 6.1.3.21.3.1-3: Data structures supported by the PUT Response Body on this resource

Data type	Р	Cardinality	Response codes	Description		
n/a			204 No Content	Successful receiving the UE acknowledgement for subscribed S-NSSAls update.		
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND		
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.						

# 6.1.3.22 Resource: CagAck (Document)

## 6.1.3.22.1 Description

This resource represents the acknowledgement of UE for CAG update for a SUPI.

### 6.1.3.22.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/am-data/cag-ack

This resource shall support the resource URI variables defined in table 6.1.3.22.2-1.

Table 6.1.3.22.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

## 6.1.3.22.3 Resource Standard Methods

#### 6.1.3.22.3.1 PUT

This method shall support the URI query parameters specified in table 6.1.3.22.3.1-1.

Table 6.1.3..3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.1.3.22.3.1-2 and the response data structures and response codes specified in table 6.1.3.22.3.1-3.

Table 6.1.3.22.3.1-2: Data structures supported by the PUT Request Body on this resource

Data type	Р	Cardinality	Description
AcknowledgeInfo	М	1	Contains the provisioning time stamp as received within the CagInfo.

Table 6.1.3.22.3.1-3: Data structures supported by the PUT Response Body on this resource

Data type	Р	Cardinality	Response codes	Description		
n/a			204 No	Successful receiving the UE acknowledgement for CAG		
			Content	configuration update.		
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors:		
- USER_NOT_FOUND						
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.						

# 6.1.3.23 Resource: LcsPrivacySubscriptionData (Document)

## 6.1.3.23.1 Description

This resource represents the subscribed LCS Privacy Data for a UE. It is queried by the HGMLC or NEF.

### 6.1.3.23.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{ueId}/lcs-privacy-data

This resource shall support the resource URI variables defined in table 6.1.3.23.2-1.

Table 6.1.3.23.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
ueld	VarUeld	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) or Generic Public Subscription Identifier (see 3GPP TS 23.501 [2] clause 5.9.8) pattern: See pattern of type VarUeld in 3GPP TS 29.571 [7].
NOTE: SUPI	is only used t	o retrieve Location Privacy profile by GMLC.

## 6.1.3.23.3 Resource Standard Methods

### 6.1.3.23.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.23.3.1-1.

Table 6.1.3.23.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6

UDM shall return the LCS Privacy Data for the UE identified by the ueId.

This method shall support the request data structures specified in table 6.1.3.23.3.1-2 and the response data structures and response codes specified in table 6.1.3.23.3.1-3.

Table 6.1.3.23.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.23.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
LcsPrivacyData	М	1	200 OK	Upon success, a response body containing the LCS Privacy Subscription Data shall be returned (see 3GPP TS 23.273 [38] clause 5.4.2)	
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND - DATA_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

# 6.1.3.24 Resource: LcsMobileOriginatedSubscriptionData (Document)

### 6.1.3.24.1 Description

This resource represents the subscribed LCS Mobile Originated Data for a SUPI. It is queried by the AMF after registering.

## 6.1.3.24.2 Resource Definition

 $Resource\ URI:\ \{apiRoot\}/nudm-sdm/<apiVersion>/\{supi\}/lcs-mo-datangerical and apiVersion>/$ 

This resource shall support the resource URI variables defined in table 6.1.3.24.2-1.

Table 6.1.3.24.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2)
		pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

# 6.1.3.24.3 Resource Standard Methods

#### 6.1.3.24.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.24.3.1-1.

Table 6.1.3.24.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6

UDM shall return the LCS Mobile Originated Data for the SUPI.

This method shall support the request data structures specified in table 6.1.3.24.3.1-2 and the response data structures and response codes specified in table 6.1.3.24.3.1-3.

Table 6.1.3.24.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.24.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description		
LcsMoData	M	1	200 OK	Upon success, a response body containing the LCS Mobile Originated Subscription Data shall be returned (see 3GPP TS 23.273 [38] clause 5.4.2)		
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND - DATA_NOT_FOUND		
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.						

# 6.1.3.25 Resource: EnhancedCoverageRestrictionData

### 6.1.3.25.1 Description

This resource represents the subscribed Enhance Coverage Restriction Data for a SUPI.

### 6.1.3.25.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/am-data/ecr-data

This resource shall support the resource URI variables defined in table 6.1.3.25.2-1.

Table 6.1.3.25.2-1: Resource URI variables for this resource

Name	Data type	Definition			
apiRoot	string	See clause 6.1.1			
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]			

## 6.1.3.25.3 Resource Standard Methods

## 6.1.3.25.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.25.3.1-1.

Table 6.1.3.25.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.1.3.25.3.1-2 and the response data structures and response codes specified in table 6.1.3.25.3.1-3.

Table 6.1.3.25.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.25.3.1-3: Data structures supported by the GET Response Body on this resource

200 OK	Upon success, a response body containing the Access and Mobility Subscription Data shall be
	returned.
	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND - DATA_NOT_FOUND
a	

# 6.1.3.26 Resource: UeContextInAmfData (Document)

## 6.1.3.26.1 Description

This resource represents the allocated AMF for a SUPI.

### 6.1.3.26.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/ue-context-in-amf-data

This resource shall support the resource URI variables defined in table 6.1.3.26.2-1.

Table 6.1.3.26.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 6.1.1
supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2)
	pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

## 6.1.3.26.3 Resource Standard Methods

#### 6.1.3.26.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.26.3.1-1.

Table 6.1.3.26.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.1.3.26.3.1-2 and the response data structures and response codes specified in table 6.1.3.26.3.1-3.

Table 6.1.3.26.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.26.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response	Description	
			codes		
UeContextInAmfDa	M	1	200 OK	Upon success, a response body containing the	
ta				UeContextInAmfData shall be returned.	
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the	
			Found	following application errors:	
				- USER_NOT_FOUND	
				- DATA_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

# 6.1.3.27 Resource: V2xSubscriptionData (Document)

# 6.1.3.27.1 Description

This resource represents the subscribed V2X Data for a SUPI. It is queried by the AMF after registering.

#### 6.1.3.27.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/v2x-data

This resource shall support the resource URI variables defined in table 6.1.3.27.2-1.

Table 6.1.3.27.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 6.1.1
supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

## 6.1.3.27.3 Resource Standard Methods

### 6.1.3.27.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.27.3.1-1.

Table 6.1.3.27.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.1.3.27.3.1-2 and the response data structures and response codes specified in table 6.1.3.27.3.1-3.

Table 6.1.3.27.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.27.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
V2xSubscriptionData	M	1	200 OK	Upon success, a response body containing the V2X Subscription Data shall be returned (see 3GPP TS 23.273 [38] clause 5.4.2)	
ProblemDetails	0	1	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND - DATA_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

# 6.1.3.28 Resource: LcsBroadcastAssistanceSubscriptionData (Document)

# 6.1.3.28.1 Description

This resource represents the subscribed LCS Broadcast Assistance Data Types for a SUPI. It is queried by the AMF.

### 6.1.3.28.2 Resource Definition

Resource URI: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/lcs-bca-data

This resource shall support the resource URI variables defined in table 6.1.3.28.2-1.

Table 6.1.3.28.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 6.1.1
supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

## 6.1.3.28.3 Resource Standard Methods

#### 6.1.3.28.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.28.3.1-1.

Table 6.1.3.28.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6
plmn-id	PlmnId	0	01	PLMN identity of the PLMN serving the UE

If "plmn-id" is included, the UDM shall return the LCS Broadcast Assistance Data Types for the SUPI associated to the PLMN identified by "plmn-id".

If "plmn-id" is not included, the UDM shall return the LCS Broadcast Assistance Data Types for the SUPI associated to the HPLMN.

This method shall support the request data structures specified in table 6.1.3.x.3.1-2 and the response data structures and response codes specified in table 6.1.3.x.3.1-3.

Table 6.1.3.28.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.1.3.28.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
LcsBroadcastAssist	М	1	200 OK	Upon success, a response body containing the list of	
anceTypesData				Broadcast Assistance Data Types Subscription Data shall be returned (see 3GPP TS 23.273 [38] clause 7.1)	
ProblemDetails	0	1	404 Not	The "cause" attribute may be used to indicate one of the	
			Found	following application errors:	
				- USER_NOT_FOUND	
				- DATA_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

# 6.1.4 Custom Operations without associated resources

In this release of this specification, no custom operations without associated resources are defined for the Nudm\_SubscriberDataManagement Service.

## 6.1.5 Notifications

### 6.1.5.1 General

This clause will specify the use of notifications and corresponding protocol details if required for the specific service. When notifications are supported by the API, it will include a reference to the general description of notifications support over the 5G SBIs specified in TS 29.500 / TS 29.501.

Table 6.1.5.1-1: Notifications overview

Notification	Resource URI	HTTP method or custom operation	Description (service operation)
Data Change Notification	{callbackReference}	POST	

# 6.1.5.2 Data Change Notification

The POST method shall be used for Data Change Notifications and the URI shall be as provided during the subscription procedure.

Resource URI: {callbackReference}

Support of URI query parameters is specified in table 6.1.5.2-1.

Table 6.1.5.2-1: URI query parameters supported by the POST method

Name	Data type	Р	Cardinality	Description
n/a				_

Support of request data structures is specified in table 6.1.5.2-2 and of response data structures and response codes is specified in table 6.1.5.2-3.

Table 6.1.5.2-2: Data structures supported by the POST Request Body

Data type	Р	Cardinality	Description
ModificationNotificati	M	1	
on			

Table 6.1.5.2-3: Data structures supported by the POST Response Body

Data type	Р	Cardinality	Response codes	Description			
n/a			204 No Content	Upon success, an empty response body shall be returned.			
ProblemDetails	0	01	307 Temporary Redirect	This represents the case when the related UE context is not fully available at the target NF Service Consumer (e.g. AMF) during a planned maintenance case (e.g. AMF planned maintenance without UDSF case). The "cause" attribute shall be set to the following application error:  - NF_CONSUMER_REDIRECT_ONE_TXN			
				See table 6.1.7.3-1 for the description of this error.			
				The Location header of the response shall be set to the new Callback URI of the target NF Service Consumer (e.g. AMF) to which the request is redirected.			
ProblemDetails	0	01	308 Permanent Redirect	This represents the case when the related UE is not found in the NF Service Consumer (e.g AMF) and the NF Service Consumer knows which NF Service Consumer is serving the UE. The "cause" attribute shall be set to the following application error:  - CONTEXT_NOT_FOUND			
				See table 6.1.7.3-1 for the description of this error.			
				The Location header of the response shall be set to the new Callback URI of the target NF Service Consumer (e.g AMF) to which the request is redirected.			
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - CONTEXT_NOT_FOUND			
				See table 6.1.7.3-1 for the description of this error.			
NOTE: In addition	NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.						

Table 6.1.5.2-4: Headers supported by the 307 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	М	1	Contains the new Callback URI of the target NF Service
				Consumer (e.g. AMF) to which the request is redirected
3gpp-Sbi-Target-	string	0	01	Identifier of the target NF (service) instance ID towards which
Nf-Id				the request is redirected

Table 6.1.5.2-5: Headers supported by the 308 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	М		Contains the new Callback URI of the target NF Service
				Consumer (e.g. AMF) to which the request is redirected
3gpp-Sbi-Target-	string	0	01	Identifier of the target NF (service) instance ID towards which
Nf-Id				the request is redirected

# 6.1.6 Data Model

# 6.1.6.1 General

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

Table 6.1.6.1-1 specifies the data types defined for the Nudm\_SDM service API.

Table 6.1.6.1-1: Nudm\_SDM specific Data Types

Data type	Clause defined	Description
Nssai	6.1.6.2.2	Network Slice Selection Assistance Information
SdmSubscription	6.1.6.2.3	A subscription to notifications
AccessAndMobilitySubscriptionData	6.1.6.2.4	Access and Mobility Subscription Data
SmfSelectionSubscriptionData	6.1.6.2.5	SMF Selection Subscription Data
DnnInfo	6.1.6.2.6	Data Network Name and associated information
		(LBO roaming allowed flag)
Snssailnfo	6.1.6.2.7	S-NSSAI and associated information (DNN Info)
SessionManagementSubscriptionData	6.1.6.2.8	User subscribed session management data
DnnConfiguration	6.1.6.2.9	User subscribed data network configuration
PduSessionTypes	6.1.6.2.11	Default/allowed session types for a data network
SscModes	6.1.6.2.12	Default/allowed SSC modes for a data network
SmsSubscriptionData	6.1.6.2.13	
SmsManagementSubscriptionData	6.1.6.2.14	SMS Management Subscription Data
SubscriptionDataSets	6.1.6.2.15	
UeContextInSmfData	6.1.6.2.16	UE Context In SMF Data
PduSession	6.1.6.2.17	
IdTranslationResult	6.1.6.2.18	SUPI that corresponds to a given GPSI
ModificationNotification	6.1.6.2.21	
IpAddress	6.1.6.2.22	IP address (IPv4, or IPv6, or IPv6 prefix)
UeContextInSmsfData	6.1.6.2.23	
SmsfInfo	6.1.6.2.24	
AcknowledgeInfo	6.1.6.2.25	
SorInfo	6.1.6.2.26	Steering Of Roaming Information
SharedData	6.1.6.2.27	Subscription Data shared by multiple UEs
PgwInfo	6.1.6.2.28	Information about the DNNs/APNs and PGW-C+SMF
		FQDNs used in interworking with EPS
TraceDataResponse	6.1.6.2.29	Contains Trace Data or a shared data Id identifying
		shared Trace Data
SteeringContainer	6.1.6.2.30	
SdmSubsModification	6.1.6.2.31	Modification instruction for a subscription to
		notifications
EmergencyInfo	6.1.6.2.32	Information about emergency session
Upulnfo	6.1.6.2.33	UE Parameters Update Information
GroupIdentifiers	6.1.6.2.34	
NiddInformation	6.1.6.2.35	Non-IP Data Delivery information
CagData	6.1.6.2.36	
CagInfo	6.1.6.2.37	
DataSetName	6.1.6.3.3	
PduSessionContinuityInd	6.1.6.3.7	A delition of the formation of the forma
AdditionalSnssaiData	6.1.6.2.38	Additional information specific to a slice
VnGroupData	6.1.6.2.39	
AppDescriptor	6.1.6.2.40	Application Dout Id
AppPortId	6.1.6.2.41	Application Port Id
LcsPrivacyData	6.1.6.2.42 6.1.6.2.43	
Lpi UnrelatedClass	6.1.6.2.44	
PlmnOperatorClass		
ValidTimePeriod	6.1.6.2.45 6.1.6.2.46	
LcsMoData	6.1.6.2.47	
EcRestrictionDataWb	6.1.6.2.48	Enhance Coverage Restriction Data
ExpectedUeBehaviourData	6.1.6.2.49	Expected UE Behaviour Data
SuggestedPacketNumDI	6.1.6.2.52	Suggested Number of Downlink Packets
SmfRegistrationInfo	6.1.6.2.53	Daggosted (Millipor of Downlink ) dokets
FrameRouteInfo	6.1.6.2.54	Frame Route Information
SorUpdateInfo	6.1.6.2.55	Tamo Rodio Information
EnhancedCoverageRestrictionData	6.1.6.2.56	Enhanced Coverage Restriction Data
EdrxParameters	6.1.6.2.57	eDRX Parameters
PtwParameters	6.1.6.2.58	Paging Time Window Parameters
OperationMode	6.1.6.3.12	Operation Mode
SorUpdateIndicator	6.1.6.3.13	SoR Update Indicator
ExternalUnrelatedClass	6.1.6.2.62	Seri Spacio maiodol
AfExternal	6.1.6.2.63	
LcsClientExternal	6.1.6.2.64	
LcsClientGroupExternal	6.1.6.2.65	
	15	1

ServiceTypeUnrelatedClass	6.1.6.2.66	
Ueld	6.1.6.2.67	
DefaultUnrelatedClass	6.1.6.2.68	
UeContextInAmfData	6.1.6.2.70	
V2xSubscriptionData	6.1.6.2.71	V2X Subscription Data
LcsBroadcastAssistanceTypesData	6.1.6.2.72	LCS Broadcast Assistance Data Types
DatasetNames	6.1.6.2.73	Data Set Names
DefaultDnnIndicator	6.1.6.3.2	
LboRoamingAllowed	6.1.6.3.2	
UeUsageType	6.1.6.3.2	
MpsPriorityIndicator	6.1.6.3.2	
McsPriorityIndicator	6.1.6.3.2	
3GppChargingCharacteristics	6.1.6.3.2	3GPP Charging Characteristics
MicoAllowed	6.1.6.3.2	
SmsSubscribed	6.1.6.3.2	
SharedDataId	6.1.6.3.2	
lwkEpsInd	6.1.6.3.2	Interworking with EPS Indication
SecuredPacket	6.1.6.3.2	
UpuRegInd	6.1.6.3.2	
ExtGroupId	6.1.6.3.2	
NbIoTUePriority	6.1.6.3.2	
CodeWord	6.1.6.3.2	
AfId	6.1.6.3.2	
LcsClientId	6.1.6.3.2	
DataSetName	6.1.6.3.3	
PduSessionContinuityInd	6.1.6.3.7	
LocationPrivacyInd	6.1.6.3.8	
PrivacyCheckRelatedAction	6.1.6.3.9	
LcsClientClass	6.1.6.3.10	
LcsMoServiceClass	6.1.6.3.11	
OperationMode	6.1.6.3.12	
SorUpdateIndicator	6.1.6.3.13	
CodeWordInd	6.1.6.3.14	
MdtUserConsent	6.1.6.3.15	MDT User Consent

Table 6.1.6.1-2 specifies data types re-used by the Nudm\_SDM service API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nudm\_SDM service API.

Table 6.1.6.1-2: Nudm\_SDM re-used Data Types

Data typo	Reference	Comments
Data type Dnn	3GPP TS 29.571 [7]	Data Network Name with Network Identifier
Dilil	3GPP 18 29.571[7]	only; this type is used as key in a map of:
		- DnnConfigurations; see clause 6.1.6.2.8;
		- EpslwkPgws; see clause 6.2.6.2.2;
		- ExpectedUeBehaviourData; see clause
		6.1.6.2.8;
DurationSec	3GPP TS 29.571 [7]	Time value in seconds
ProblemDetails	3GPP TS 29.571 [7]	Common data type used in response bodies
Snssai	3GPP TS 29.571 [7]	Single NSSAI
Uri	3GPP TS 29.571 [7]	Uniform Resource Identifier
Gpsi	3GPP TS 29.571 [7]	Generic Public Subscription Identifier
RatType	3GPP TS 29.571 [7]	Radio Access Technology Type
Area	3GPP TS 29.571 [7]	Radio Access Technology Type
	3GPP TS 29.571 [7]	
ServiceAreaRestriction	3GPP TS 29.571 [7]	
CoreNetworkType		200 20DD TC 20 500 [4] clause 6 6
SupportedFeatures PlmnId	3GPP TS 29.571 [7]	see 3GPP TS 29.500 [4] clause 6.6 PLMN Identity
	3GPP TS 29.571 [7]	PLIMIN Identity
PduSessionType	3GPP TS 29.571 [7]	0hihl D-flt O-0
SubscribedDefaultQos	3GPP TS 29.571 [7]	Subscribed Default QoS
Ambr	3GPP TS 29.571 [7]	DduCassianId is seed as less in the
PduSessionId	3GPP TS 29.571 [7]	PduSessionId is used as key in a map of
Nifing store and di	2000 TO 20 574 57	PduSessions; see clause 6.1.6.2.16.
NfInstanceId	3GPP TS 29.571 [7]	
Supi	3GPP TS 29.571 [7]	
RfspIndex	3GPP TS 29.571 [7]	
SscMode	3GPP TS 29.571 [7]	
lpv4Addr	3GPP TS 29.571 [7]	
lpv6Addr	3GPP TS 29.571 [7]	
Ipv6Prefix	3GPP TS 29.571 [7]	
SorMac	3GPP TS 29.509 [24]	
SteeringInfo	3GPP TS 29.509 [24]	
AckInd	3GPP TS 29.509 [24]	
CounterSor	3GPP TS 29.509 [24]	
UpuMac	3GPP TS 29.509 [24]	
UpuData	3GPP TS 29.509 [24]	
UpuAckInd	3GPP TS 29.509 [24]	
CounterUpu	3GPP TS 29.509 [24]	
TraceData	3GPP TS 29.571 [7]	Trace control and configuration parameters
NotifyItem	3GPP TS 29.571 [7]	
UpSecurity	3GPP TS 29.571 [7]	
ServiceName	3GPP TS 29.510 [19]	
OdbPacketServices	3GPP TS 29.571 [7]	
GroupId	3GPP TS 29.571 [7]	This type is also used as key of a map in
		attributes:
		<ul> <li>vnGroupInfo and sharedVnGroupDatalds;</li> </ul>
		see clause 6.1.6.2.4, 6.1.6.2.8, 6.1.6.2.27;
DateTime	3GPP TS 29.571 [7]	
Cagld	3GPP TS 29.571 [7]	
StnSr	3GPP TS 29.571 [7]	Session Transfer Number for SRVCC
CMsisdn	3GPP TS 29.571 [7]	Correlation MSISDN
Osld	3GPP TS 29.519 [33]	
Uint16	3GPP TS 29.571 [7]	
RgWirelineCharacteristics	3GPP TS 29.571 [7]	
GeographicArea	3GPP TS 29.572 [34]	
LcsServiceType	3GPP TS 29.572 [34]	
ScheduledCommunicationTime	3GPP TS 29.571 [7]	Scheduled Communication Time
LocationArea	6.5.6.2.10	-
StationaryIndication	3GPP TS 29.571 [7]	Stationary Indication
TrafficProfile	3GPP TS 29.571 [7]	Traffic Profile
ScheduledCommunicationType	3GPP TS 29.571 [7]	Scheduled Communication Type
BatteryIndication	3GPP TS 29.571 [7]	Battery Indication
Acsinfo	3GPP TS 29.571 [7]	ACS Information
IPv4AddrMask	3GPP TS 29.571 [7]	//OS IIIOMIAGOT
Nefld	3GPP TS 29.510 [19]	
PatchResult	3GPP TS 29.571 [7]	

NrV2xAuth	3GPP TS 29.571 [7]
LteV2xAuth	3GPP TS 29.571 [7]
BitRate	3GPP TS 29.571 [7]
MdtConfiguration	3GPP TS 29.571 [7]
Uint64	3GPP TS 29.571 [7]
WirelineArea	3GPP TS 29.571 [7]
WirelineServiceAreaRestriction	3GPP TS 29.571 [7]

# 6.1.6.2 Structured data types

# 6.1.6.2.1 Introduction

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

6.1.6.2.2 Type: Nssai

Table 6.1.6.2.2-1: Definition of type Nssai

Attribute name	Data type	P	Cardinality	Description	Applicability		
supportedFeatures	SupportedFeatures	0	01	See clause 6.1.8			
defaultSingleNssais	array(Snssai)	М	1N	A list of Single Nssais used as default. (NOTE)			
singleNssais	array(Snssai)	0	1N	List of non default Single Nssais. (NOTE)			
provisioningTime	DateTime	С	01	This attribute shall be present if the Nssai is sent to the AMF while reception has not yet been acknowledged from the UE; otherwise shall be absent.  This attribute serves as Network Slicing			
additionalSnssaiData map(AdditionalSnssa iData)  Subscription Change Indication.  A map (list of key-value pairs where singleNssai converted to string serves as key) of additional information related to this single Nssai.							
NOTE: If the NF consumer does not support Nssaa optional feature, the UDM shall not include S-NSSAI(s) subject to Network Slice-Specific Authentication and Authorization in the message body with "200 OK" response (See clause 5.2.2.2.2).							

6.1.6.2.3 Type: SdmSubscription

Table 6.1.6.2.3-1: Definition of type SdmSubscription

Attribute name	Data type	Р	Cardinality	Description	Applicability
nflnstanceld	NfInstanceId	М	1	Identity of the NF Instance creating the	
implicitUnsubscribe	boolean	0	01	subscription.  If present with value true indicates that the subscription expires when the subscribing NF	
				(AMF, SMF, SMSF) identified by the nfInstanceId ceases to be registered at the	
				UDM. When the subscribing NF is an SMF, this	
				means that the subscription is terminated by UDM when the last PDU session of such SMF is deregistered for a given SUPI.	
				If the subscribing NF (AMF. SMF, SMSF) is not registered when the SDM subscription with implicitUnsubscribe indicator set to true is	
				received by the UDM, the UDM should return a confirmed expiry time in the expires attribute to	
				the subscribing NF even when the expires attribute is absent from the request.  See NOTE 1.	
expires	DateTime	С	01	If present, indicates the point in time at which the subscription expires. Shall be present if	
				implicitUnsubscribe is absent or false. Within a POST request the proposed expiry time is conveyed whereas in a POST response	
				or PATCH response the confirmed expiry time is returned.	
callbackReference	Uri	М	1	URI provided by the NF service consumer to receive notifications	
amfServiceName	ServiceName	0	01	When present, this IE shall contain the name of the AMF service to which Data Change Notifications are to be sent (see clause 6.5.2.2 of 3GPP TS 29.500 [4]). This IE may be	
	4.0			included if the NF service consumer is an AMF.	
monitoredResourceUris	array(Uri)	M	1N	A set of URIs that identify the resources for which a change triggers a notification. The URI shall take the form of either an absolute URI or an absolute-path reference as defined in IETF RFC 3986 [31].	
				See NOTE 3.	
singleNssai	Snssai	0	01	This IE may be present if the consumer is SMF. This attribute shall be also used as filter for the Nudr notifications when sdmSubscription is	
				included in subscriptionDataSubscription in Nudr POST operation. See NOTE 2.	
dnn	Dnn	0	01	This IE may be present if the consumer is SMF. This attribute shall be also used as filter for the	
				Nudr notifications when sdmSubscription is included in subscriptionDataSubscription in Nudr POST operation.	
				When present, this IE shall contain the Network Identifier only, or Wildcard DNN. See NOTE 2.	
subscriptionId	string	С	01	This attribute shall be present if the SdmSubscription is sent in a GET response	
				message on Nudr. It identifies the individual sdmSubscription stored in the UDR and may	
				be used by the UDM to delete an expired or implicitly unsubscribed sdmSubscription.	

plmnld	Plmnld	С	01	If present, it indicates the PLMN of the NF Instance creating the subscription (i.e., the PLMN serving the UE).	
				It shall be present if the NF Instance is located in a different PLMN than the UDM.	
				If absent, the Home PLMN ID is used as default.	
immediateReport	boolean	0	01	This IE indicates whether immediate report is needed or not.	ImmediateRep ort
				When present, this IE shall be set as following: - true: immediate report is required - false (default) immediate report is not required	
report	SubscriptionDataSet s	С	01	This IE shall be present in Subscribe response, if the immediateReport attribute is set to "true" in Subscribe request.	ImmediateRep ort
				When present, this IE shall contain the representation of subscription data sets that to be monitored, i.e. listed in monitoredResourceUris attribute.	
supportedFeatures	SupportedFeatures	0	01	See clause 6.1.8 These are the features supported by the NF subscribing at the UDM.	
contextInfo	ContextInfo	С	01	This IE if present may contain e.g. the headers received by the UDM along with the SdmSubscription. Shall be absent on Nudm and may be present on Nudr.	

NOTE 1: The subscription expires if the last registration identified by the nfInstanceId for the UE is deregistered at the UDM, e.g. the UDM shall remove the SdmSubscription of the SMF, if the UE's last PDU session SMF registration of this SMF is deregistered.

NOTE 2: If "singleNssai" is not included, and "dnn" is not included, the UDM shall notify the data change of all DNN configurations and network slice(s).

If "singleNssai" is included, and "dnn" is not included, the UDM shall notify the data change of network slice identified by "singleNssai" and all DNN configurations for the requested network slice identified by "singleNssai".

If "singleNssai" is not included, and "dnn" is included, the UDM shall notify the data change of all network slices where such DNN is available and all DNN configurations identified by "dnn".

If "singleNssai" is included, and "dnn" is included, the UDM shall notify the data change of network slice identified by "singleNssai" where such DNN is available and the DNN configuration identified by "dnn", if such DNN is available in the network slice identified by "singleNssai".

NOTE 3: The UDM should handle only the relative-path part (apiSpecificResourceUriPart, see 3GPP TS 29.501 [5] clause 4.4.1) and ignore possible inconsistencies in the base URI part.

6.1.6.2.4 Type: AccessAndMobilitySubscriptionData

Table 6.1.6.2.4-1: Definition of type AccessAndMobilitySubscriptionData

Data type	Р	Cardinality	Description	Applicability
SupportedFeatur	0	01	See clause 6.1.8	
es	_			
			3GPP TS 29.571 [7]	
	0		3GPP TS 23.501 [2] clause 5.9.7	
map(SharedDatal d)	0	1N	A map of identifiers of shared 5G VN group data (list of key-value pairs whereGroupId serves as key; see clause 6.1.6.1).  This attribute is only applicable to the Nudm interface and shall not be included over the Nudr interface.	
AmbrRm	0	01		
Nssai			Network Slice Selection Assistance Information	
array(RatType)	0	0N	List of RAT Types that are restricted in 5GC and	
array(Area)	0	0N	List of forbidden areas in 5GS	
ServiceAreaRestr iction	0	01	Subscribed Service Area Restriction	
array(CoreNetwo rkType)	0	0N	List of Core Network Types that are restricted. The use of the value "5GC" is deprecated on Nudm and shall be discarded by the receiving AMF.	
RfspIndexRm	0	01		
DurationSecRm	0	01	Subscribed periodic registration timer; (see clause 5.20 of 3GPP TS 23.501 [2], clause 4.15.3.2.3b and 4.15.6.3a of 3GPP TS 23.502 [3] and 3GPP TS 29.571 [7]	
UeUsageType	0			
MpsPriorityIndica tor	0	01		
McsPriorityIndicat or	0	01		
DurationSecRm	0	01	subscribed active time for PSM UEs (see clause 5.20 of 3GPP TS 23.501 [2] and clause 4.15.3.2.3b and 4.15.6.3a of 3GPP TS 23.502 [3]).	
SorInfo	0	01	On Nudm, this IE shall be present if the UDM shall send the information for Steering of Roaming during registration or the subscription data update to the UE. The UDM may detect the need to send sorInfo by retrieving context information from the UDR. (NOTE 4)	
Boolean	C	01	Contains the indication on whether or not the UE is expecting to receive SoR information at initial registration.  - When set to true; it indicates that the UE is expecting to receive SoR information at initial registration in a VPLMN, i.e. the UDM shall send SoR information to the AMF on Nudm even when nothing was received from UDR or SOR-AF. In case the UDM was not able to obtain SoR information, SoR information sent on Nudm shall contain the indication that "no change" is needed.  - When set to false: it indicates that the UE is not expecting to receive SoR information at initial registration, i.e. the UDM shall send SoR information to the AMF based on operator policy.  This attribute may be present on Nudr interface and shall be absent on UDM interface.	
	SupportedFeatur es array(Gpsi)  array(GroupId)  map(SharedDatal d)  AmbrRm  Nssai array(RatType)  array(Area) ServiceAreaRestriction array(CoreNetworkType)  RfspIndexRm DurationSecRm  UeUsageType MpsPriorityIndicator McsPriorityIndicator DurationSecRm	SupportedFeatur es array(Gpsi) O array(GroupId) O map(SharedDatal d) O MSsai O array(RatType) O array(Area) O ServiceAreaRestr iction array(CoreNetwo rkType) RfspIndexRm O DurationSecRm O McsPriorityIndicat or DurationSecRm O SorInfo O SorInfo	SupportedFeatur es array(Gpsi) O 01  array(GroupId) O 1N  map(SharedDatal d) O 1N  AmbrRm O 01  Array(RatType) O 0N  array(Area) O 01  ServiceAreaRestr iction array(CoreNetwo rkType)  RfspIndexRm O 01  DurationSecRm O 01  UeUsageType O 01  McsPriorityIndicat or DurationSecRm O 01  SorInfo O 01  SorInfo O 01	SupportedFeatur es array(Gpsi) O 0N List of Generic Public Subscription Identifier; see 3GPP TS 29.571 [7] array(Groupld) O 1N List of internal group identifier; see 3GPP TS 23.501 [2] clause 5.9.7 map(SharedDatal d) O 1N A map of identifiers of shared 5G NV group data (list of key-value pairs whereGroupld serves as key; see clause 6.16.1). This attribute is only applicable to the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not be included over the Nudm interface and shall not

sorafRetrieval	boolean	С	01	Contains the indication on whether or not SoR	
				information shall be retrieved from the SOR-AF.	
				<ul> <li>When set to true: it indicates that the UDM shall retrieve SoR information from the SOR-AF.</li> </ul>	
				- When set to false or absent: it indicates that	
				the retrieval of SorInfo from the SOR-AF is not	
				required.	
				This attribute may be present on Nudr interface and shall be absent on Nudm interface.	
	(0.11.1.1			The UDM shall ignore this attribute if it is received in Nudr but the UE is not roaming out of its HPLMN.	
sorUpdateIndicatorList	array(SorUpdateI ndicator)	С	1N	When present, it contains the list of SoR Update Indicators;	
	indicator)			It shall indicate that the AMF shall retrieve	
				SoR information when the UE performs	
				Registration with NAS Registration Type "Initial	
				Registration" if the value "INITIAL_REGISTRATION" is included;	
				- And/or it shall indicate that the AMF shall	
				retrieve SoR information when the UE performs	
				Registration with NAS Registration Type	
				"Emergency Registration" if the value "EMERGENCY_REGISTRATION" is included.	
				When absent on Nudm interface, it indicates that the	
				AMF is not requested to retrieve SoR information	
				when the UE performs Registration with either NAS Registration Type "Initial Registration" or NAS	
				Registration Type "Emergency Registration".	
				The UDM shall ignore this attribute if the UE is not roaming out of its HPLMN.	
upuInfo	UpuInfo	0	01	This IE shall be present if the UDM shall send the	
				information for UE Parameters Update after the UE has been successfully authenticated and registered	
				to the 5G system.	
micoAllowed	MicoAllowed	0	01	Indicates whether the UE subscription allows MICO mode.	
sharedAmDataIds	array(SharedDat ald)	0	0N	Identifier of shared Access And Mobility Subscription data	SharedData
odbPacketServices	OdbPacketServic es	0	01	Operator Determined Barring for Packet Oriented Services (NOTE 3).	
subscribedDnnList	array(Dnn)	0	0N	List of the subscribed DNNs for the UE (including	
				optionally the Wildcard DNN). Used to determine the list of LADN available to the UE as defined in	
				clause 5.6.5 of TS 23.501 [2].	
				When present, this IE shall contain the Network Identifier only.	
serviceGapTime	DurationSec	0	01	Used to set the Service Gap timer for Service Gap	
				Control (see TS 23.501 [2] clause 5.26.16 and	
mdtUserConsent	MdtUserConsent	0	01	TS 23.502 [3] clause 4.2.2.2.2).  When present, this IE shall indicate whether the user	
matoon contonit	atoooroonioont		J 1	has given his consent for MDT activation or not (see	
				clause 4.9 of 3GPP TS 32.422 [48]).	
				When absent, "CONSENT_NOT_GIVEN" is the default value.	
mdtConfiguration	MdtConfiguration	С	01	This IE shall be present if the MDT task is activated. When present, this IE shall contain MDT	
				configuration data for UE (see clause 4.1.2.17 of	
traceData	TraceData	0	01	3GPP TS 32.422 [48]).  Trace requirements about the UE, only sent to AMF	
cagData	CagData	0	01	in the HPLMN or one of its equivalent PLMN(s) Closed Access Group Data.	CAGFeature
oagData	Jaguala		Juli 1	Shall be absent if both	OAOI eature
				- no CAG is subscribed for the serving PLMN and	
				- an acknowledgement from the UE is not pending.	

	T	-	1-		
stnSr	StnSr	0	01	This IE shall be present if the UE is subscribed to 5G SRVCC. When present, it indicates the STN-SR (Session	
				Transfer Number for SRVCC) of the UE.	
cMsisdn	CMsisdn	0	01	This IE shall be present if the UE is subscribed to 5G SRVCC.	
				When present, it indicates the C-MSISDN (Correlation MSISDN) of the UE.	
nbIoTUePriority	NbIoTUePriority	0	01	Indicates NB IoT UE priority which is used by the	
				NG-RAN to prioritise resource allocation between UEs accessing via NB-IoT(see clause 5.31.17 of 3GPP TS 23.501 [2]).	
nssaiInclusionAllowed	boolean	0	01	Indicates that the UE is allowed to include NSSAI in the RRC connection establishment in clear text for 3GPP access, as specified in clause 5.15.9 of 3GPP TS 23.501 [2] and clause 4.2.2.2.2 of 3GPP TS 23.502 [3].	
				true: indicates that NSSAI can be included in RRC connection establishment by the UE.	
				false or absent: indicates that NSSAI cannot be included.	
•	RgWirelineChara	0	01	Indicates the RG Level Wireline Access	
cs ecRestrictionDataWb	cteristics EcRestrictionDat	0	01	Characteristics as specified in 3GPP TS 23.316 [37]. Indicates Enhanced Coverage Restriction Data for	
50. 100monoribatavvo	aWb			WB-N1 mode.	
				If absent, indicates Enhanced Coverage is not restricted for WB-N1 mode.	
ecRestrictionDataNb	boolean	0	01	If present, this IE shall indicate whether Enhanced Coverage for NB-N1 mode is restricted or not.	
				true: Enhanced Coverage for NB-N1 mode is restricted. false or absent: Enhanced Coverage for NB-N1 mode is allowed.	
expectedUeBehaviour	ExpectedUeBeha viourData	Ο	01	Indicates Expected UE Behaviour parameters associated with AMF(see clause 5.20 of 3GPP TS 23.501 [2] and clause 4.15.6.3 of 3GPP TS 23.502 [3]).  This attribute is only applicable to the Nudm interface and shall not be included over the Nudr interface.	
primaryRatRestrictions	array(RatType)	0	0N	List of RAT Types that are restricted for use as primary RAT in 5GC and EPC; see 3GPP TS 29.571 [7] (NOTE 2)	
secondaryRatRestricti ons	array(RatType)	0	0N	List of RAT Types that are restricted for use as secondary RAT in 5GC and EPC; see	
O110				3GPP TS 29.571 [7] (NOTE 2)	
edrxParametersList	array(EdrxParam eters)	0	1N	List of subscribed the extended idle mode DRX parameters (see clause 5.31.7.2.1 of	
ptwParametersList	array(PtwParame	0	1N	3GPP TS 23.501 [2]). List of subscribed the Paging Time Window	
ptm arameterscist	ters)			parameters (see clause 5.31.7.2.1 of 3GPP TS 23.501 [2]).	
iabOperationAllowed	boolean	0	01	Indicates that the UE is allowed for IAB operation as specified in 3GPP TS 23.501 [2].	
				true: indicates that the UE is allowed for IAB operation.	
				false or absent: indicates that the UE is not allowed for IAB operation.	
wirelineForbiddenArea s	array(WirelineAre a)	0	0N	List of forbidden areas for 5G-BRG/5G-CRG/FN-CRG	
wirelineServiceAreaRe striction	WirelineServiceA reaRestriction	0	01	Subscribed Service Area Restriction for 5G-BRG/5G-CRG/FN-CRG	

NOTE 1:	AccessAndMobilitySubscriptionData can be UE-individual data or shared data.	
	UE-individual data take precedence over shared data.	I
	E.g.: When an attribute of type array is present but empty within UE-Individual data and present (with any	I
	cardinality) in shared data, the empty array takes precedence. Similarly, when a nullable attribute is	I
	present with value null within the individual data and present (with any value) in shared data, the null value	İ
	takes precedence (i.e. for the concerned UE the attribute is considered absent).	I
NOTE 2:	If the primaryRatRestrictions and secondaryRatRestrictions attributes are supported by the sender, the	I
	sender shall include the list of RAT Types that are restricted, if any, in the ratRestrictions attribute, shall	İ
	include the list of RAT Types that are restricted for use as primary RAT, if any, in the	I
	primaryRatRestrictions attribute and shall include the list of RAT Types that are restricted for use as	İ
	secondary RAT, if any, in the secondaryRatRestrictions attribute. If the primaryRatRestrictions and	I
	secondaryRatRestrictions attributes are supported by the receiver, the receiver shall use the data in the	I
	primaryRatRestrictions attribute, if received, as the list of RAT Types that are restricted for use as primary	I
	RAT, and shall use the data in the secondaryRatRestrictions attribute, if received, as the list of RAT Types	I
	that are restricted for use as secondary RAT, otherwise the receiver shall use the data in the	İ
	ratRestrictions attribute, if received, as the list of RAT Types that are restricted.	I
	If the secondaryRatRestictions attribute is included in the subscription profile, the content may be sent to	I
	MME during inter RAT handover from NR SA to EN-DC, for the purpose of adequate SGW selection at	İ
	MME based on subscription profile, and to avoid allocating unnecessary resources for secondary RAT at	I
	EPC if it is restricted.	1
NOTE 3:	The AMF shall take responsibility to perform PDU session related actions subject to change of	1
	OdbPacketService, e.g. release existing PDU session.	İ
NOTE 4:	The UDM shall ignore the content of sorInfo received on Nudr if "sorafRetrieval" is set to true.	<u> </u>

# 6.1.6.2.5 Type: SmfSelectionSubscriptionData

# Table 6.1.6.2.5-1: Definition of type SmfSelectionSubscriptionData

Attribute name	Data type	Р	Cardinality	Description	Applicability
supportedFeatures	SupportedFeatures	0	01	See clause 6.1.8	
subscribedSnssaiInfos	map(SnssaiInfo)	0	0N	List of S-NSSAIs and associated information (DNN Info); see 3GPP TS 23.501 [2] clause 6.3.2.  A map (list of key-value pairs where singleNssai converted to string serves as key; see 3GPP TS 29.571 [7]) of arrays of DnnInfo	
sharedSnssaiInfosId	aredSnssaiInfosId SharedDataId O 01 Identifier of shared SnssaiInfo		Identifier of shared SnssaiInfos.	SharedData	
NOTE: A single UE-ind					
sharedSnssailı subscribedSns					

Type: DnnInfo 6.1.6.2.6

Table 6.1.6.2.6-1: Definition of type DnnInfo

Attribute name	Data type	Р	Cardinality	Description
dnn	Dnn	М	1	Data Network Name with Network Identifier only., or Wildcard DNN (NOTE)
defaultDnnIndicator	DefaultDnnIndica tor	0	01	Indicates whether this DNN is the default DNN: true: The DNN is the default DNN (NOTE); false: The DNN is not the default DNN; If this attribute is absent it means the DNN is not the default DNN.
IboRoamingAllowed	LboRoamingAllo wed	0	01	Indicates whether local breakout for the DNN is allowed when roaming: true: Allowed; false: Not allowed; If this attribute is absent it means not allowed.
iwkEpsInd	lwkEpsInd	0	01	Indicates whether interworking with EPS is subscribed: true: Subscribed; false: Not subscribed; If this attribute is absent it means not subscribed.
dnnBarred	boolean	С	01	Indicates whether the DNN is barred. Absence and false indicates "not barred".  This attribute is only used on the Nudr interface. The UDM shall handle barred DNNs received from the UDR as not subscribed.
invokeNefInd	boolean	0	01	Indicates whether the NEF based infrequent small data transfer shall be used for the PDU Session associated with the S-NSSAI and DNN. true: Used; false: Not used; If this attribute is absent it means not used.
smfList	array(NfInstancel d)	0	1N	Indicate the associated SMF(s) if the static IP address/prefix is used.
sameSmfInd	boolean	0	01	Indicates whether the same SMF for multiple PDU sessions to the same DNN and S-NSSAI is required. true: Required; false: Not required; If this attribute is absent it means not required.

Type: SnssaiInfo 6.1.6.2.7

Table 6.1.6.2.7-1: Definition of type Snssailnfo

Attribute name	Data type	Р	Cardinality	Description
dnnInfos	array(DnnInfo)	М	1N	list of Data Network Names for an S-NSSAI and
				associated information

6.1.6.2.8 Type: SessionManagementSubscriptionData

Table 6.1.6.2.8-1: Definition of type SessionManagementSubscriptionData

Attribute name	Data type	Р	Cardinality	Description	Applicability	
singleNssai	Snssai	М	1	A single Network Slice Selection Assistance Information		
dnnConfigurations	map(DnnConfigurati on)	0	0N	Additional DNN configurations for the network slice; A map (list of key-value pairs where DNN, or optionally the Wildcard DNN, serves as key; see clause 6.1.6.1) of DnnConfigurations. (NOTE 1)		
internalGroupIds	array(GroupId)	0	1N	List of internal group identifier; see 3GPP TS 23.501 [2] clause 5.9.7		
sharedVnGroupDataIds	map(SharedDataId)	0	1N	A map of identifiers of shared 5G VN group data (list of key-value pairs where GroupId serves as key; see clause 6.1.6.1). This attribute is only applicable to the Nudm interface and shall not be included over the Nudr interface.		
traceData	TraceData	0	01	Trace requirements about the UE, only sent to SMF in the HPLMN or one of its equivalent PLMN(s)		
sharedDnnConfiguration sld	SharedDatald	0	01	Identifier of shared data for DNN configuration.	SharedData	
sharedTraceDataId	SharedDataId	0	01	Identifier of shared data for trace requirements		
odbPacketServices	OdbPacketServices	0	01	Operator Determined Barring for Packet Oriented Services (NOTE 2).		
expectedUeBehaviourLi st	map(ExpectedUeBe haviourData)	0	1N	A map of ExpectedUeBehaviourDatas associated with SMF (DNN serves as key; see clause 6.1.6.1), see clause 5.20 of 3GPP TS 23.501 [2] and clause 4.15.6.3 of 3GPP TS 23.502 [3].  This attribute is only applicable to the Nudm interface and shall not be included over the Nudr interface.		
suggestedPacketNumDI List	map(SuggestedPack etNumDI)	0	1N	A map (list of key-value pairs where dnn serves as key; see clause 6.1.6.1) of SuggestedPacketNumDls which are associated with SMF (see clause 5.20 of 3GPP TS 23.501 [2] and clause 4.15.6.3 of 3GPP TS 23.502 [3]). This attribute is only applicable to the Nudm interface and shall not be included over the Nudr interface.		
3gppChargingCharacter istics	3GppChargingChara cteristics	0	01	Subscribed charging characteristics data associated to the subscription.		
NOTE 1: A given UE-individual dnnConfiguration (within dnnConfigurations) may clash with a shared dnnConfiguration (i.e. both have the same dnn value as key). In this case the clashing attributes of the UE-individual dnnConfiguration take precedence.  NOTE 2: The SMF shall not trigger PDU session release when receiving change of OdbPacketService. Only the AMF take responsibility to perform PDU session related actions subject to change of ODB setting, e.g. release existing PDU session.						

6.1.6.2.9 Type: DnnConfiguration

Table 6.1.6.2.9-1: Definition of type DnnConfiguration

Attribute name	Data type	Р	Cardinality	Description
pduSessionTypes	PduSessionTypes	М	1	Default/Allowed session types
sscModes	SscModes	М	1	Default/Allowed SSC modes
iwkEpsInd	lwkEpsInd	0	01	Indicates whether interworking with EPS is subscribed: true: Subscribed; false: Not subscribed; If this attribute is absent it means not subscribed.
5gQosProfile	SubscribedDefaultQ os	0	01	5G QoS parameters associated to the session for a data network
sessionAmbr	Ambr	0	01	The maximum aggregated uplink and downlink bit rates to be shared across all Non-GBR QoS Flows in each PDU Session
3gppChargingCharacter istics	3GppChargingChara cteristics	0	01	Subscribed charging characteristics data associated to the session for a data network. (NOTE 1)
staticlpAddress	array(IpAddress)	0	12	Subscribed static IP address(es) of the IPv4 and/or IPv6 type
upSecurity	UpSecurity	0	01	When present, this IE shall indicate the security policy for integrity protection and encryption for the user plane.
pduSessionContinuityIn d	PduSessionContinuit yInd	0	01	When present, this IE shall indicate how to handle a PDU Session when UE the moves to or from NB-IoT.  If this attribute is absent it means that Local policy shall be used.
niddNefld	Nefld	С	01	Indicates the identity of the NEF to be selected for NIDD service for this DNN. It is required if invokeNefSelection attribute is present with value "true".
niddInfo	NiddInformation	0	01	When present, this IE shall indicate information used for SMF-NEF Connection. This attribute may be present if "Invoke NEF Selection" indicator is set.
redundantSessionAllow ed	boolean	0	01	Indicates whether redundant PDU Sessions are allowed: true: Allowed; false: Not allowed; If this attribute is absent it means not allowed.
acsInfo	AcsInfo	0	01	When present, this IE shall include the ACS information for the 5G-RG as defined in BBF TR-069 [42] or in BBF TR-369 [43].
ipv4FrameRouteList	array(FrameRouteInf o)	0	1N	List of Frame Route information of IPv4, see clause 5.6.14 of 3GPP TS 23.501 [2].
ipv6FrameRouteList	array(FrameRouteInf o)	0	1N	List of Frame Route information of IPv6, see clause 5.6.14 of 3GPP TS 23.501 [2].
atsssAllowed	boolean	0	01	Indicates whether this DNN supports ATSSS, i.e. whether Multi-Access PDU session is allowed to this DNN. true: Allowed; false (default): Not allowed; If this attribute is absent it means this DNN does not allow ATSSS.
secondaryAuth	boolean	0	01	Indicates whether secondary authentication and authorization is needed. true: required. false: not required. If absent, it indicates that secondary authentication is not required by subscription data, but it still may be required by local policies at the SMF. (NOTE 2)

dnAaalpAddressAllocati	boolean	0	01	Indicates whether the SMF is required to
on				request the UE IP address from the DN-AAA
				server for PDU Session Establishment.
				true: required
				false: not required
				If absent, it indicates that the request by SMF
				of the UE IP address from the DN-AAA server
				is not required by subscription data, but it still
				may be required by local policies at the SMF.
dnAaaAddress	IpAddress	0	01	The address information of DN-AAA server,
				used for secondary authentication and
				authorization.
				(NOTE 2)
iptvAccCtrlInfo	string	0	01	The IPTV access control information used in
				IPTV access procedure, see clause 7.7.1.1.2 of
				3GPP TS 23.316 [37].
NOTE 1: When present	this attribute shall take	preced	lence over the	"3gppChargingCharacteristics" attribute in the
CassianManas		lavial		

SessionManagementSubscriptionData level.

NOTE 2: These attributes shall be consistent with the information received on the 5GVnGroupData (see clause 6.5.6.2.7), in the Nudm\_PP API.

6.1.6.2.10 Void

6.1.6.2.11 Type: PduSessionTypes

Table 6.1.6.2.11-1: Definition of type PduSessionTypes

Attribute name	Data type	Р	Cardinality	Description
defaultSessionType	PduSessionType	М	1	Default session type
allowedSessionTypes	array(PduSessionTy pe)	0		Additional session types allowed for the data network

6.1.6.2.12 Type: SscModes

Table 6.1.6.2.12-1: Definition of type SscModes

Attribute name	Data type	Р	Cardinality	Description
defaultSscMode	SscMode	М	1	Default SSC mode
allowedSscModes	array(SscMode)	0	12	Additional SSC modes allowed for the data
				network

6.1.6.2.13 Type: SmsSubscriptionData

Table 6.1.6.2.13-1: Definition of type SmsSubscriptionData

Attribute name	Data type	Р	Cardinality	Description
smsSubscribed	SmsSubscribed	С	01	Indicates whether the UE subscription allows SMS
				delivery over NAS. Shall not be absent unless the
				feature SharedData is supported and
				smsSubscribed is present within shared data.
sharedSmsSubsDataId	SharedDataId	С	01	Identifier of shared data. Shall be present if
				smsSubscribed is absent.

# 6.1.6.2.14 Type: SmsManagementSubscriptionData

Table 6.1.6.2.14-1: Definition of type SmsManagementSubscriptionData

Attribute name	Data type	Р	Cardinality	Description	Applicability
supportedFeatures	SupportedFeatur es	0	01	See clause 6.1.8	
mtSmsSubscribed	boolean	С	01	O1 Indicates the SMS teleservice subscription for MT-SMS. Shall not be absent unless the feature SharedData is supported and mtSmsSubscribed is present within shared data.	
mtSmsBarringAll	boolean	С	01	Barring of all MT-SMS	
mtSmsBarringRoaming	boolean	С	01	Barring of MT-SMS when roaming outside the Home Public Land Mobile Network (PLMN) country	
moSmsSubscribed	boolean	С	01	Indicates the SMS teleservice subscription for MO- SMS. Shall not be absent unless the feature SharedData is supported and mtSmsSubscribed is present within shared data.	
moSmsBarringAll	boolean	С	01	Barring of all MO-SMS	
moSmsBarringRoaming	boolean	С	01	Barring of MO-SMS when roaming outside the Home Public Land Mobile Network (PLMN) country	
traceData	TraceData	0	01	Trace requirements about the UE, only sent to SMSF in HPLMN	
sharedSmsMngDatalds	array(SharedDat ald)	С	1N	Identifier of shared data. Shall be present if mtSmsSubscribed and/or moSmsSubscribed and/or traceData are absent.	SharedData

# 6.1.6.2.15 Type: SubscriptionDataSets

Table 6.1.6.2.15-1: Definition of type SusbcriptionDataSets

Attribute name	Data type	Р	Cardinality	Description
amData	AccessAndMobilityS ubscriptionData	0	01	Access and Mobility Subscription Data
smfSelData	SmfSelectionSubscriptionData	0	01	SMF Selection Subscription Data
uecAmfData	UeContextInAmfData	0	01	UE Context In AMF Data
uecSmfData	UeContextInSmfData	0	01	UE Context In SMF Data
uecSmsfData	UeContextInSmsfDat a	0	01	UE Context In SMSF Data
smsSubsData	SmsSubscriptionDat a	0	01	SMS Subscription Data
smData	array(SessionManag ementSubscriptionD ata)	0	1N	Session Management Subscription Data
traceData	TraceData	0	01	Trace Data. The Null value indicates that trace is not active.
smsMngData	SmsManagementSu bscriptionData	0	01	SMS Management Subscription Data
IcsPrivacyData	LcsPrivacyData	0	01	LCS Privacy Subscription Data
IcsMoData	LcsMoData	0	01	LCS Mobile Originated Subscription Data
v2xData	V2xSubscriptionData	0	01	V2x Subscription Data
IcsBroadcastAssistance TypesData	LcsBroadcastAssista nceTypesData	0	01	LCS List of Broadcast Assistance Data Types Subscription Data

6.1.6.2.16 Type: UeContextInSmfData

Table 6.1.6.2.16-1: Definition of type UeContextInSmfData

Attribute name	Data type	P	Cardinality	Description
pduSessions	map(PduSession)	0	0N	A map (list of key-value pairs where pduSessionId
				converted from integer to string serves as key; see
				clause 6.1.6.1) of PduSessions.
pgwInfo	array(PgwInfo)	0	1N	Information about the DNNs/APNs and PGW-
				C+SMF FQDNs used in interworking with EPS
emergencyInfo	EmergencyInfo	0	01	Information about emergency session

6.1.6.2.17 Type: PduSession

Table 6.1.6.2.17-1: Definition of type PduSession

Attribute name	Data type	Р	Cardinality	Description	
dnn	Dnn	М	1	Data Network Name with Network Identifier only.	
smflnstanceld	NfInstanceld	М	1	NF Instance Id of the SMF	
plmnld	Plmnld	М	1	PLMN Id of the SMF	
singleNssai	Snssai	0	01	A single Network Slice Selection Assistance Information. (NOTE)	
NOTE: For supporting selection of the same SMF if a UE requests multiple PDU sessions associated with the same DNN and same S-NSSAL the S-NSSAL associated to the PDU session is required to be included.					

6.1.6.2.18 Type: IdTranslationResult

Table 6.1.6.2.18-1: Definition of type IdTranslationResult

Attribute name	Data type	Р	Cardinality	Description
supportedFeatures	SupportedFeatures	0	01	See clause 6.1.8
supi	Supi	М	1	SUPI
gpsi	Gpsi	С		If ueld is a SUPI in Resource URI variables, this shall be present and indicates an MSISDN or external identifier.

6.1.6.2.19 Void

6.1.6.2.20 Void

6.1.6.2.21 Type: ModificationNotification

Table 6.1.6.2.21-1: Definition of type ModificationNotification

Attribute name	Data type	Р	Cardinality	Description
notifyItems	array(NotifyItem)	М	1N	

6.1.6.2.22 Type: IpAddress

Table 6.1.6.2.22-1: Definition of type IpAddress

Attribute name	Data type	Р	Cardinality	Description
ipv4Addr	lpv4Addr	С	01	
ipv6Addr	lpv6Addr	С	01	
ipv6Prefix	Ipv6Prefix	С	01	
NOTE: Fither inv4Ac	ldr or inv6Addr or inv6			

6.1.6.2.23 Type: UeContextInSmsfData

Table 6.1.6.2.23-1: Definition of type UeContextInSmsfData

Attribute name	Data type	Р	Cardinality	Description
smsfInfo3GppAccess	SmsfInfo	0	01	SMSF Info for 3GPP Access
smsfInfoNon3GppAcc	SmsfInfo	0	01	SMSF Info for Non 3GPP Access
ess				

6.1.6.2.24 Type: SmsfInfo

Table 6.1.6.2.24-1: Definition of type SmsfInfo

Attribute name	Data type	Р	Cardinality	Description
smsflnstanceld	NfInstanceld	М	1	NF Instance Id of the SMSF
plmnld	Plmnld	М	1	PLMN Id of the SMSF

6.1.6.2.25 Type: AcknowledgeInfo

Table 6.1.6.2.25: Definition of type AcknowledgeInfo

Attribute name	Data type	Р	Cardinality	Description
sorMaclue	SorMac	С	01	Shall be present when the Acknowledgement is sent to acknowledge receipt of SorInfo.
upuMaclue	UpuMac	С	01	Shall be present when the Acknowledgement is sent to acknowledge receipt of Upulnfo.
provisioningTime	DateTime	M	1	the provisioning time is used to correlate the acknowledgement with the modification request, to address glare cases when multiple modifications are ongoing simultaneously.

6.1.6.2.26 Type: SorInfo

Table 6.1.6.2.26: Definition of type SorInfo

Attribute name	Data type	Р	Cardinality	Description
ackInd	AckInd	М	1	Contains the indication on whether an acknowledgement from UE is to be requested to the UE.
sorMaclausf	SorMac	С	01	Contains the SoR-MAC-IAUSF. Shall be present when SorInfo is sent within AccessAndMobilitySubscriptionData on Nudm, and shall be absent when sent on Nudr or within PpData.
countersor	CounterSor	С	01	Contains the CounterSoR. Shall be present when SorInfo is sent within AccessAndMobilitySubscription on Nudm, and shall be absent when sent on Nudr or within PpData.
steeringContainer	SteeringContaine r	С	01	When present, this information contains the information needed to update the "Operator Controlled PLMN Selector with Access Technology" list stored in the USIM either as an array of preferred PLMN/AccessTechnologies combinations in priority order (with the first entry in the array indicating the highest priority and the last entry indicating the lowest) or a secured packet.  If no change of the "Operator Controlled PLMN Selector with Access Technology" list stored in the USIM is needed, then this attribute shall be absent. This attribute shall be present when SorInfo is sent within PpData.
provisioningTime	DateTime	М	1	Point in time of SorInfo provisioning at the UDR or SOR-AF.

6.1.6.2.27 Type: SharedData

Table 6.1.6.2.27-1: Definition of type SharedData

Attribute name	Data type	Р	Cardinality	Description
sharedDataId	SharedDatald	М	1	Identifier of the shared data
sharedAmData	AccessAndMobilityS ubscriptionData	0	01	Shared Access and Mobility Subscription Data
sharedSmsSubsData	SmsSubscriptionDat a	0	01	Shared SMS Subscription Data
sharedSmsMngSubsD ata	SmsManagementSu bscriptionData	0	01	Shared SMS Management Subscription Data
sharedDnnConfigurati ons	map(DnnConfigurati	0	1N	Shared DNN configurations
sharedTraceData	TraceData	0	01	Shared Trace Data
sharedSnssaiInfos	map(SnssaiInfo)	0	1N	Shared Snssai Infos
sharedVnGroupDatas	map(VnGroupData)	0	1N	A map of shared 5G VN group data (list of key-value pairs where Groupld serves as key; see clause 6.1.6.1).

Note 1: Exactly one of sharedAmData, sharedSmsSubsData, sharedSmsMngSubsData sharedDnnConfigurations, sharedTraceData and sharedSnssailnfos shall be present.

Note 2: The attributes sharedAmData, sharedSmsSubsData and SharedSmsMngSubsData shall not contain sharedDataIds

Note 3: When shared data clash with individual data, individual data shall take precedence.

6.1.6.2.28 Type: PgwInfo

Table 6.1.6.2.28-1: Definition of type PgwInfo

Attribute name	Data type	Р	Cardinality	Description
dnn	Dnn	M	1	DNN/APN with Network Identifier only.
pgwFqdn	string	M	1	FQDN of the PGW-C+SMF
plmnld	Plmnld	0	01	PLMN where the PGW-C+SMF is located
epdgInd	boolean	0	01	If present, it indicates whether access is from ePDG or not. true: access is from ePDG. false or absent: access is not from ePDG

6.1.6.2.29 Type: TraceDataResponse

Table 6.1.6.2.29-1: Definition of type TraceDataResponse

Attribute name	Data type	Р	Cardinality	Description	Applicability
traceData	TraceData	С	01	UE-individual trace data. Shall not be absent	
				unless the feature SharedData is supported	
				and traceData is present within shared data.	
sharedTraceDataId	SharedDataId	С	01	Shared data identifier. Shall be present if	_
				traceData is absent.	

6.1.6.2.30 Type: SteeringContainer

Table 6.1.6.2.30-1: Definition of type SteeringContainer as a list of mutually exclusive alternatives

Data type	Cardinality	Description
array(SteeringInfo)	1N	List of PLMN/AccessTechnologies
		combinations.
SecuredPacket		A Secured packet containing one or more APDUs commands dedicated to Remote File Management or command responses (see ETSI TS 102.225 [28]).

6.1.6.2.31 Type: SdmSubsModification

Table 6.1.6.2.31-1: Definition of type SdmSubsModification

Attribute name	Data type	Р	Cardinality	Description		
expires	DateTime	0	01	If present, indicates the point in time at which the subscription expires. Within a PATCH request the proposed new expiry time is conveyed.		
monitoredResourceUris	array(Uri)	0	1N	If present, indicates the updated resources URIs to be monitored. The URI shall take the form of either an absolute URI or an absolute-path reference as defined in IETF RFC 3986 [31]. See NOTE.		
NOTE: The UDM should handle only the relative-path part (apiSpecificResourceUriPart, see 3GPP TS 29.501 [5] clause 4.4.1) and ignore possible inconsistencies in the base URI part.						

6.1.6.2.32 Type: EmergencyInfo

Table 6.1.6.2.32-1: Definition of type EmergencyInfo

Attribute name	Data type	Р	Cardinality	Description
pgwFqdn	string	С	01	FQDN of the PGW-C+SMF for emergency session; either pgwFqdn or ipAddress shall be present.
pgwlpAddress	IpAddress	С	01	IP address of the PGW-C+SMF for emergency session
smfInstanceId	NfInstanceId	0	01	NF Instance Id of the SMF for emergency session
epdgInd	boolean	0	01	If present, it indicates whether access is from ePDG or not. true: access is from ePDG. false or absent: access is not from ePDG.

6.1.6.2.33 Type: Upulnfo

Table 6.1.6.2.33-1: Definition of type Upulnfo

Attribute name	Data type	P	Cardinality	Description
upuDataList	array(UpuData)	M	1N	This information defines the UE Parameters Update (UPU). A secured packet with the Routing indicator update data is included and/or the Default configured NSSAI update data are included on Nudm. An unsecured Routing indicator update data or secured packet with the Routing indicator update data, and/or the Default configured NSSAI update data are included on Nudr.
upuRegInd	UpuRegInd	М	1	Contains the indication of whether the re-registration is requested.
upuAckInd	UpuAckInd	М	1	Contains the indication of whether the acknowledgement from UE is needed.
upuMaclausf	UpuMac	С	01	Contains the UPU-MAC-I <sub>AUSF</sub> . Shall be present when UpuInfo is sent within AccessAndMobilitySubscriptionData on Nudm, and shall be absent when sent on Nudr.
counterUpu	CounterUpu	С	01	Contains the Counter <sub>UPU</sub> . Shall be present when UpuInfo is sent within AccessAndMobilitySubscriptionData on Nudm, and shall be absent when sent on Nudr.
provisioningTime	DateTime	M	1	Point in time of provisioning of UPU by the UDR.

6.1.6.2.34 Type: GroupIdentifiers

Table 6.1.6.2.34-1: Definition of type GroupIdentifiers

Attribute name	Data type	Р	Cardinality	Description
extGroupId	ExtGroupId	С	01	This IE shall contain the External Group ID
				associated to the provided Internal Group ID.
intGroupId	GroupId	С	01	This IE shall contain the Internal Group ID
·				associated to the provided External Group ID
ueldList	array(Ueld)	С	1N	This IE shall contain a list of the UE identifiers that
				belong to the provided Internal/External Group ID if
				they are required.

6.1.6.2.35 Type: NiddInformation

Table 6.1.6.2.35-1: Definition of type NiddInformation

Attribute name	Data type	Р	Cardinality	Description
afld	string	M	1	The string identifying the AF as the owner of associated NIDD Configuration on T8 interface, which is carried in {scsAsId} URI variable in NIDD API (see clause 5.6.3.2.2 of 3GPP TS 29.122 [45]).
gpsi	Gpsi	0	01	Generic Public Subscription Identifier
extGroupId	ExternalGroupId	0	01	Indicates External Group Identifier which the user belongs to.

6.1.6.2.36 Type: CagData

Table 6.1.6.2.36-1: Definition of type CagData

Attribute name	Data type	Р	Cardinality	Description
cagInfos	map(CagInfo)	M	0N	A map (list of key-value pairs where PlmnId converted to string serves as key; see 3GPP TS 29.571 [7]) of CagInfo An empty map indicates that for no PLMN CAG is subscribed and shall only be sent when provisioningTime is present (i.e. when
				acknowledgement from the UE is pending).  If provisioningTime is present (i.e. the acknowledgement from the UE is still pending), the complete map of CagInfo (i.e. for all PLMNs) shall be present; otherwise only the CagInfo relevant to the Serving PLMN should be present.
provisioningTime	DateTime	С	01	This attribute shall be present if the CagData is sent to the AMF while reception has not yet been acknowledged from the UE; otherwise shall be absent. Presence of this attribute indicates that the AMF needs to update the UE with the complete map of CagInfo.  This attribute serves as CAG information
				Subscription Change Indication

6.1.6.2.37 Type: CagInfo

Table 6.1.6.2.37-1: Definition of type CagInfo

Attribute name	Data type	Р	Cardinality	Description
allowedCagList	array(Cagld)	М	1N	List of allowed CAG Ids.
cagOnlyIndicator	boolean	0	01	true indicates that the UE is restricted to only access 5GS via CAG cells;
				absence and false indicate that the UE is not restricted to only access 5GS via CAG cells.

6.1.6.2.38 Type: AdditionalSnssaiData

Table 6.1.6.2.38-1: Definition of type AdditionalSnssaiData

Attribute name	Data type	P	Cardinality	Description
requiredAuthnAuthz	boolean	0	01	Indicates whether an S-NSSAI is subject to Network
				Slice-Specific Authentication and Authorization:
				true: subject to network slice-specific authentication and authorization
				- false, or absent: not subject to network slice-
				specific authentication and authorization

6.1.6.2.39 Type: VnGroupData

Table 6.1.6.2.39-1: Definition of type VnGroupData

Attribute name	Data type	Р	Cardinality	Description		
pduSessionTypes	PduSessionTypes	0	01	Allowed session types		
dnn	Dnn	0	01	Data Network Name with Network Identifier only. (NOTE)		
singleNssai	Snssai	0	01	Single Nssai		
appDescriptors	array(AppDescriptor)	0	1N	List of Application Descriptors		
NOTE: Only a 1:1 mapping between DNN and 5G VN group is supported in this release						

6.1.6.2.40 Type: AppDescriptor

Table 6.1.6.2.40-1: Definition of type AppDescriptor

Attribute name	Data type	Р	Cardinality	Description
osld	Osld	0	01	OS identifier, does not include an OS version
				number
appld	string	0	01	Application identifier, does not include a version
				number for the application

6.1.6.2.41 Type: AppPortId

Table 6.1.6.2.41-1: Definition of type AppPortId

Attribute name	Data type	Р	Cardinality	Description
destinationPort	Uint16	0	1	Indicates the receiving port of application in the receving device or AF.
originatorPort	Uint16	0	1	Indicates the sending port of application in sending device.

6.1.6.2.42 Type: LcsPrivacyData

Table 6.1.6.2.42-1: Definition of type LcsProfileData

Attribute name	Data type	Р	Cardinality	Description
lpi	Lpi	0	01	If present, indicates the Location Privacy Indication
				(see 3GPP TS 23.273 [38] clause 5.4.2.3)
				If absent, indicates that location for UE is allowed.
unrelatedClass	UnrelatedClass	0	01	Indicates Call/Session unrelated Classes for the user
				(see 3GPP TS 23.273 [38] clause 5.4.2.2.3).
plmnOperatorClasse	array(PlmnOpera	0	1N	Indicates PLMN Operator Class for the user (see
S	torClass)			3GPP TS 23.273 [38] clause 5.4.2.2.4).

6.1.6.2.43 Type: Lpi

Table 6.1.6.2.43-1: Definition of type Lpi

Attribute name	Data type	Р	Cardinality	Description
locationPrivacyInd	LocationPrivacyIn d	Μ	1	Indication of one of the following mutually exclusive global settings:  - Location is disallowed - Location is allowed
validTimePeriod	ValidTimePeriod	0	01	If present, indicate Time period during which the Location Privacy Indication is valid.  If absent, indicates there is no time limitation.

6.1.6.2.44 Type: UnrelatedClass

Table 6.1.6.2.44-1: Definition of type UnrelatedClass

Attribute name	Data type	P	Cardinality	Description				
defaultUnrelatedCl	DefaultUnrelatedCl	M	1	The default Call/Session unrelated Class subscription				
ass	ass			for unidentified value added LCS clients or AFs.				
externalUnrelatedC	ExternalUnrelated	0	01	The Call/Session unrelated Class subscriptions for				
lass	Class			identified value added LCS Clients, AFs and value				
				added LCS Client groups.				
serviceTypeUnrelat	array(ServiceType	0	1X( NOTE	The Call/Session unrelated Class subscriptions for				
edClasses	UnrelatedClass)		2) identified service types for UE.( NOTE 1)					
NOTE 1: It is possible that there are multiple serviceTypeUnrelatedClasses, whose maximum number is decied by								
المستنما ألملمة	total number of comice time defined in SCDD TC 22 074 [47]							

total number of service type defined in 3GPP TS 22.071 [47], NOTE 2: X indicates the total number of service type defined in 3GPP TS 22.071 [47].

6.1.6.2.45 Type: PlmnOperatorClass

Table 6.1.6.2.45-1: Definition of type PlmnOperatorClass

Attribute name	Data type	Р	Cardinality	Description
IcsClientClass	LcsClientClass	М	1	Indicated the PLMN operator class of LCS client that are allowed to locate the particular UE (see 3GPP TS 23.273 [38] clause 5.4.2.2.4).
IcsClientIds	array(LcsClientId)	М	1N	List of LCS clients for the corresponding LCS Client Class

6.1.6.2.46 Type: ValidTimePeriod

Table 6.1.6.2.46-1: Definition of type ValidTimePeriod

Attribute name	Data type	P	Cardinality	Description
startTime	DateTime	0	01	If present, indicates the start time If absent, indicates there is no start time, and it shall be valid immediately. (NOTE 1)
endTime	DateTime	0	01	If present, indicates the end time. If absent, indicates there is no end time. (NOTE 1)

6.1.6.2.47 Type: LcsMoData

Table 6.1.6.2.47-1: Definition of type LcsMoData

Attribute name	Data type	Р	Cardinality	Description
allowedServiceClass	array(LcsMoServi	M	1N	List of MO-LR services allowed for a UE subscriber
es	ceClass)			

6.1.6.2.48 Type: EcRestrictionDataWb

Table 6.1.6.2.48-1: Definition of type EcRestrictionData

Attribute name	Data type	Р	Cardinality	Description
ecModeARestricted	boolean	0	01	If present, indicates whether Enhanced Coverage Mode A is restricted or not. true: Enhanced Coverage Mode A is restricted. false or absent: Enhanced Coverage Mode A is not restricted.
ecModeBRestricted	boolean	0	01	If present, indicates whether Enhanced Coverage Mode B is restricted or not. true: Enhanced Coverage Mode B is restricted. false or absent: Enhanced Coverage Mode B is not restricted.

NOTE: At least one of the attributes ecModeARestricted and ecModeBRestricted shall be contained, and If the value of attribute ecModeARestricted is set to true, the value of attribute ecModeBRestricted shall be set to true.

6.1.6.2.49 Type: ExpectedUeBehaviourData

Table 6.1.6.2.49-1: Definition of type ExpectedUeBehaviourData

Attribute name	Data type	Р	Cardinality	Description
stationaryIndication	StationaryIndicati on	0	01	Identifies whether the UE is stationary or mobile (see TS 23.502 [3] clause 4.15.6.3).
communicationDuration Time	DurationSec	0	01	Indicates for how long the UE will normally stay in CM-Connected for data transmission (see TS 23.502 [3] clause 4.15.6.3).
periodicTime	DurationSec	0	01	Identifies interval time of periodic communication (see TS 23.502 [3] clause 4.15.6.3).
scheduledCommunicati onTime	ScheduledComm unicationTime	0	01	Identifies time and day of the week when the UE is available for communication (see TS 23.502 [3] clause 4.15.6.3).
scheduledCommunicati onType	ScheduledComm unicationType	0	01	Indicates that the Scheduled Communication Type (see TS 23.502 [3] clause 4.15.6.3). (Note 5)
expectedUmts	array(LocationAr ea)	0	1N	Identifies the UE's expected geographical movement. The attribute is only applicable in 5G (see TS 23.502 [3] clause 4.15.6.3). (NOTE 3, NOTE 4)
trafficProfile	TrafficProfile	0	01	Identifies the type of data transmission: single packet transmission (UL or DL), dual packet transmission (UL with subsequent DL or DL with subsequent UL), multiple packets transmission
batteryIndication	BatteryIndication	0	01	Indicates the power consumption type(s) of the UE (see TS 23.502 [3] clause 4.15.6.3).
validityTime	DateTime	0	01	If present, identifies when the expected UE behaviour parameters expire and shall be deleted locally if it expire (see TS 23.502 [3] clause 4.15.6.3). (NOTE 2)

- NOTE 1: At least one of optional parameters (expect for validityTime) above shall be present.
- NOTE 2: If this attribute is omitted, no expiry for the expected UE behaviour parameters applies.
- NOTE 3: The first instance of the attribute represents the start of the location, and the last one represents the stop of the location.
- NOTE 4: The parameter expectedUmts is only used by AMF.
- NOTE 5: The value of attribute "scheduledCommunicationType" shall be used together with the value of "scheduledCommunicationTime".

6.1.6.2.50 Void

6.1.6.2.51 Void

6.1.6.2.52 Type: SuggestedPacketNumDI

Table 6.1.6.2.52-1: Definition of type SuggestedPacketNumDI

Attribute name	Data type	Р	Cardinality	Description		
suggestedPacketNumDI	integer	М	1	Value in number of packets.		
validityTime	DateTime	0		If present, identifies the time to which the Network Configuration Parameters expire and shall be deleted locally if it expire (see TS 23.502 [3] clause 4.15.6.3a). (NOTE 1)		
NOTE 1: If this attribute is omitted, no expiry for the expected UE behaviour parameters applies.						

6.1.6.2.53 Type: SmfRegistrationInfo

Table 6.1.6.2.53-1: Definition of type SmfRegistrationInfo

Attribute name	Data type	Р	Cardinality	Description
smfRegistrationList	array(SmfReg	M	1N	List of SmfRegistration.
	istration)			

6.1.6.2.54 Type: FrameRouteInfo

Table 6.1.6.2.54-1: Definition of type FrameRouteInfo

Attribute name	Data type	Р	Cardinality	Description	
ipv4Mask	IPv4AddrMask	C	01	Indicates IPv4 address mask.	
ipv6Prefix	Ipv6Prefix	С	01	Indicates IPv6 prefix.	
NOTE: Either ipv4Mask or ipv6Prefix shall be present.					

6.1.6.2.55 Type: SorUpdateInfo

Table 6.1.6.2.55-1: SorUpdateInfo

Attribute name	Data type	Р	Cardinality	Description
vplmnld	Plmnld	М	1	Serving node PLMN identity.

6.1.6.2.56 Type: EnhancedCoverageRestrictionData

Table 6.1.6.2.56-1: Definition of type EnhancedCoverageRestrictionData

Attribute name	Data type	P	Cardinality	Description
plmnEcInfoList	array(PlmnEcInfo)	0		It may indicate a complete list of serving PLMNs where Enhanced Coverage Restriction shall be allowed and the detailed enhanced coverage restriction configuration under per the PLMN.

6.1.6.2.57 Type: EdrxParameters

Table 6.1.6.2.57-1: EdrxParameters

Attribute name	Data type	Р	Cardinality	Description			
ratType	RatType	M	1	This IE shall indicate the RAT type which eDRX value are applicable to.  Only the following values are allowed:  "EUTRA"  "NBIOT"  "LTE-M"			
edrxValue	string	M	1	This IE shall indicate eDRX Cycle length value, it shall be encoded as a string of bits 4 to 1 of octet 3 in the "Extended DRX parameter" IE (see Figure 10.5.5.32 of 3GPP TS 24.008 [46]). Pattern: '^([0-1]{4})\$'			

6.1.6.2.58 Type: PtwParameters

Table 6.1.6.2.58-1: PtwParameters

Attribute name	Data type	Р	Cardinality	Description		
operationMode	OperationMode	М	1	This IE shall indicate the Operation Mode which PTW value are applicable to.		
ptwValue	string	M	1	This IE shall indicate RAT specific Subscribed Paging Time Window length value, it shall be encoded as a string of bits 8 to 5 of octet 3 in the "Extended DRX parameter" IE (see Figure 10.5.5.32 of 3GPP TS 24.008 [46]). Pattern: '^([0-1]{4})\$'		
NOTE: The relationship between values of operationMode and ptwValue shall be in line with clause 10.5.5.32 of 3GPP TS 24.008 [46].						

6.1.6.2.59 Void

6.1.6.2.60 Void

6.1.6.2.61 Type: Void

6.1.6.2.62 Type: ExternalUnrelatedClass

Table 6.1.6.2.62-1: Definition of type ExternalUnrelatedClass

Attribute name	Data type	Р	Cardinality	Description
IcsClientExternals	array(LcsClientExt	0	1N	The list of Call/session Unrelated Class identified by
	ernal)			LCS client in the external LCS client list for the list
afExternals	array(AfExternal)	0	1N	The list of Call/session Unrelated Class identified by
				AF in the external LCS client list
IcsClientGroupExte	array(LcsClientGro	0	1N	The list of Call/session Unrelated Class identified by
rnals	upExternal)			LCS client group in the external LCS client list

6.1.6.2.63 Type: AfExternal

Table 6.1.6.2.63-1: Definition of type AfExternal

Attribute name	Data type	Р	Cardinality	Description	
afld	Afld	0	01	AF Identifier (see 3GPP TS 23.273 [38] clause	
				5.4.2.2.3)	
allowedGeographic	array(GeographicA	0	1N	Indicates Geographical area where positioning is	
Area	rea)			allowed (see 3GPP TS 23.273 [38] clause 5.4.2.2.3).	
privacyCheckRelat	PrivacyCheckRelat	0	01	Indicates action related to privacy check.	
edAction	edAction			(NOTE)	
validTimePeriod	ValidTimePeriod	0	01	Time period when positioning is allowed	
NOTE: "LOCATION_ALLOWED_WITHOUT_NOTIFICATION" is default value and "LOCATION_NOT_ALLOWED" is					
not optional for the a	ttribute.				

6.1.6.2.64 Type: LcsClientExternal

Table 6.1.6.2.64-1: Definition of type LcsClientExternal

Attribute name	Data type	Р	Cardinality	Description		
IcsClientId	LcsClientId	0	01	Lcs Client Identifier (see 3GPP TS 23.273 [38] clause		
				5.4.2.2.3)		
allowedGeographic	array(GeographicA	0	1N	Indicates Geographical area where positioning is		
Area	rea)			allowed (see 3GPP TS 23.273 [38] clause 5.4.2.2.3).		
privacyCheckRelat	PrivacyCheckRelat	0	01	Indicates action related to privacy check.		
edAction	edAction			(NOTE)		
validTimePeriod	ValidTimePeriod	0	01	Time period when positioning is allowed		
NOTE: "LOCATION_	NOTE: "LOCATION_ALLOWED_WITHOUT_NOTIFICATION" is default value and "LOCATION_NOT_ALLOWED" is					

not optional for the attribute.

6.1.6.2.65 Type: LcsClientGroupExternal

Table 6.1.6.2.65-1: Definition of type LcsClientGroupExternal

Attribute name	Data type	Р	Cardinality	Description
IcsClientGroupId	ExtGroupId	0	01	LCS Client Group Identifier
allowedGeographic Area	array(GeographicA rea)	0	1N	Indicates Geographical area where positioning is allowed (see 3GPP TS 23.273 [38] clause 5.4.2.2.3).
	PrivacyCheckRelat edAction	0	01	Indicates action related to privacy check. (NOTE)
	ValidTimePeriod	0	01	Time period when positioning is allowed
NOTE: "LOCATION_ALLOWED_WITHOUT_NOTIFICATION" is default value and "LOCATION_NOT_ALLOWED" is not optional for the attribute.				

6.1.6.2.66 Type: ServiceTypeUnrelatedClass

Table 6.1.6.2.66-1: Definition of type ServiceTypeUnrelatedClass

Attribute name	Data type	Р	Cardinality	Description
serviceType	LcsServiceType	М	1	One of the service type defined in 3GPP TS 22.071 [47].
allowedGeographic Area	array(GeographicA rea)	0	1N	Indicates Geographical area where positioning is allowed (see 3GPP TS 23.273 [38] clause 5.4.2.2.3).
privacyCheckRelat edAction	PrivacyCheckRelat edAction	0	01	Indicates action related to privacy check. (NOTE)
codeWordInd	CodeWordInd	0	01	Indication that codeword shall be checked in UE or one or more codeword values to be checked in GMLC
validTimePeriod	ValidTimePeriod	0	01	Time period when positioning is allowed
codeWordList	array(CodeWord)	С	1N	This IE shall be present when codeWordInd is "CODEWORD_CHECK_IN_GMLC".
				When present, this IE shall contain one or more CodeWords used by GMLC for verification.
NOTE: "LOCATION	ALLOWED WITHOU	T N O I	FIFICATION" i	s default value and "LOCATION_NOT_ALLOWED" isl

not optional for the attribute.

6.1.6.2.67 Type: Ueld

Table 6.1.6.2.67-1: Definition of type Ueld

Attribute name	Data type	Р	Cardinality	Description
supi	Supi	M	1	This IE shall indicate the SUPI.
gpsiList	array(gpsi)	0	1N	This IE shall indicate a list of GPSIs that is
				associated with the SUPI.

6.1.6.2.68 Type: DefaultUnrelatedClass

Table 6.1.6.2.68-1: Definition of type DefaultUnrelatedClass

Attribute name	Data type	Р	Cardinality	Description		
allowedGeographic	array(GeographicA	0	1N	Indicates Geographical area where positioning is		
Area	rea)			allowed (see 3GPP TS 23.273 [38] clause 5.4.2.2.3).		
privacyCheckRelat	PrivacyCheckRelat	0	01	Indicates action related to privacy check.		
edAction	edAction			(NOTE)		
codeWordInd	CodeWordInd	0	01	Indication that codeword shall be checked in UE or		
				one or more codeword values to be checked in		
				GMLC		
validTimePeriod	ValidTimePeriod	0	01	Time period when positioning is allowed		
codeWordList	array(CodeWord)	С	1N	This IE shall be present when codeWordInd is		
				present with value		
				"CODEWORD_CHECK_IN_GMLC".		
				When present, this IE shall contain one or more		
				CodeWords used by GMLC for verification.		
NOTE: "LOCATION	NOTE: "LOCATION_NOT_ALLOWED" is default value and only values "LOCATION_NOT_ALLOWED",					
"LOCATIO	N_ALLOWED_WITH	_TUO	NOTIFICATION	N",		
"LOCATIO	ON_ALLOWED_WITH	OUT_F	RESPONSE",	"LOCATION_RESTRICTED_WITHOUT_RESPONSE"		

6.1.6.2.69 Type: ContextInfo

Table 6.1.6.2.69-1: Definition of type ContextInfo

Attribute name	Data type	Р	Cardinality	Description
origHeaders	array(string)	0	1N	Headers received by the UDM from NFs consuming
				Nudm services. The encoding of the header shall
				comply with clause 3.2 of IETF RFC 7230 [50]

6.1.6.2.70 Type: UeContextInAmfData

Table 6.1.6.2.70-1: Definition of type UeContextInAmfData

Attribute name	Data type	Р	Cardinality	Description
epsInterworkingInfo	EpsInterworkingInf o	0	01	This IE contains the associations between APN/DNN and PGW-C+SMF selected by the AMF for EPS
				interworking.

6.1.6.2.71 Type: V2xSubscriptionData

Table 6.1.6.2.71-1: Definition of type V2xSubscriptionData

Attribute name	Data type	Р	Cardinality	Description
nrV2xServicesAuth	NrV2xAuth	0	01	Indicates whether the UE is authorized to use the
				LTE sidelink for V2X services.
IteV2xServicesAuth	LteV2xAuth	0	01	Indicates whether the UE is authorized to use the
				NR sidelink for V2X services.
nrUePc5Ambr	BitRate	0	01	Indicates UE-PC5-AMBR for V2X communication
				over PC5 reference point for NR PC5.
ItePc5Ambr	BitRate	0	01	Indicates UE-PC5-AMBR for V2X communication
				over PC5 reference point for LTE PC5.

6.1.6.2.72 Type: LcsBroadcastAssistanceTypesData

Table 6.1.6.2.72-1: Definition of type LcsBroadcastAssistanceTypesData

Attribute name	Data type	Р	Cardinality	Description
Attribute manie	Data type		Carumanty	Description

locationAssistanceTy	Rinary	М	1	This IE contains a bitmap which indicates the
pe	Біпат <b>у</b>	IVI		broadcast location assistance data types for which the UE is subscribed to receive ciphering keys used to decipher broadcast assistance data. A bit set to 1 indicates that the UE is subscribed to receive ciphering keys applicable to corresponding positioning SIB type.
				The mapping of the bits to the positioning SIB types is as follows:
				bit 8 in the first octet maps to positioning SIB Type 1-1 bit 7 in the first octet maps to positioning SIB
				Type 1-2 bit 6 in the first octet maps to positioning SIB
				Type 1-3 bit 5 in the first octet maps to positioning SIB Type 1-4
				bit 4 in the first octet maps to positioning SIB Type 1-5
				bit 3 in the first octet maps to positioning SIB Type 1-6
				bit 2 in the first octet maps to positioning SIB Type 1-7
				bit 1 in the first octet maps to positioning SIB Type 1-8
				bit 8 in the second octet maps to positioning SIB Type 2-1
				bit 7 in the second octet maps to positioning SIB     Type 2-2     bit 6 in the second octet maps to positioning SIB
				Type 2-3 bit 5 in the second octet maps to positioning SIB
				Type 2-4 bit 4 in the second octet maps to positioning SIB Type 2-5
				bit 3 in the second octet maps to positioning SIB Type 2-6
				bit 2 in the second octet maps to positioning SIB Type 2-7 bit 1 in the second octet maps to positioning SIB
				Type 2-8
				bit 8 in the third octet maps to positioning SIB Type 2-9 bit 7 in the third octet maps to positioning SIB
				Type 2-10 bit 6 in the third octet maps to positioning SIB
				Type 2-11 bit 5 in the third octet maps to positioning SIB
				Type 2-12 bit 4 in the third octet maps to positioning SIB
				Type 2-13 bit 3 in the third octet maps to positioning SIB
				Type 2-14 bit 2 in the third octet maps to positioning SIB Type 2-15
				bit 1 in the third octet maps to positioning SIB Type 2-16
				bit 8 in the fourth octet maps to positioning SIB Type 2-17
				bit 7 in the fourth octet maps to positioning SIB Type 2-18
				bit 6 in the fourth octet maps to positioning SIB Type 2-19

bit 5 in the fourth octet maps to positioning SIB Type 2-20 bit 4 in the fourth octet maps to positioning SIB Type 2-21 bit 3 in the fourth octet maps to positioning SIB Type 2-22 bit 2 in the fourth octet maps to positioning SIB Type 2-23 bit 1 in the fourth octet maps to positioning SIB Type 2-24 bit 7 in the fifth octet maps to positioning SIB Type 2-25 bit 6 in the fifth octet maps to positioning SIB Type 3-1 bit 5 in the fifth octet maps to positioning SIB Type 4-1 bit 4 in the fifth octet maps to positioning SIB Type 5-1 bit 3 in the fifth octet maps to positioning SIB Type 6-1 bit 2 in the fifth octet maps to positioning SIB Type 6-2
bit 2 in the fifth octet maps to positioning SIB Type 6-2 bit 1 in the fifth octet maps to positioning SIB Type 6-3
Any unassigned bits are spare and shall be coded as zero. Non-included bits shall be treated as being coded as zero.

# 6.1.6.2.73 Type: DatasetNames

Table 6.1.6.2.73-1: Definition of type DatasetNames

Data type	Cardinality	Description
array(DataSetName)	2N	List of names of the data sets

# 6.1.6.3 Simple data types and enumerations

# 6.1.6.3.1 Introduction

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

# 6.1.6.3.2 Simple data types

The simple data types defined in table 6.1.6.3.2-1 shall be supported.

Table 6.1.6.3.2-1: Simple data types

Type Name	Type Definition	Description
DefaultDnnIndicator	boolean	Indicates whether a DNN is the default DNN
LboRoamingAllowed	boolean	This flag indicates whether local breakout is allowed when roaming.
UeUsageType	integer	Indicates the usage characteristics of the UE, enables the selection of a specific Dedicated Core Network for EPS interworking
MpsPriorityIndicator	boolean	Indicates whether UE is subscribed to multimedia priority service
McsPriorityIndicator	boolean	Indicates whether UE is subscribed to mission critical service
3GppChargingChara cteristics	string	16-bit string identifying charging characteristics as specified in 3GPP TS 32.255 [11] Annex A and 3GPP TS 32.298 [12] clause 5.1.2.2.7, in hexadecimal representation. Each character in the string shall take a value of "0" to "9" or "A" to "F" and shall represent 4 bits. The most significant character representing the 4 most significant bits of the charging characteristics shall appear first in the string, and the character representing the 4 least significant bits of the charging characteristics shall appear last in the string.  Example: The charging characteristic 0x123A shall be encoded as "123A".
MicoAllowed	boolean	Indicates whether MICO mode is allowed for the UE.
SmsSubscribed	boolean	Indicates whether the UE subscription allows SMS delivery over NAS.
SharedDataId	string	Identifies globally and uniquely a piece of subscription data shared by multiple UEs. The value shall start with the HPLMN id (MCC/MNC) followed by a hyphen followed by a local Id as allocated by the home network operator.  pattern: "^[0-9]{5,6}+\$"
lwkEpsInd	boolean	Indicates whether Interworking with EPS is supported
SecuredPacket	string	Indicates the secured packet as specified in 3GPP TS 24.501 [27]. It is encoded using base64 and represented as a String. Format: base64
UpuRegInd	boolean	true indicates that re-registration is requested after the successful UE parameters update.
ExtGroupId	string	String containing a External Group ID. Pattern: "^extgroupid-[^@]+@[^@]+\$"
NbIoTUePriority	integer	Unsigned integer indicating the NB-IoT UE Priority (see clause 5.31.17 of 3GPP TS 23.501 [8]), the value is between 0 and 255 and lower value indicates higher priority.
CodeWord	string	Indicates the codeword as specified in 3GPP TS 23.273 [38] clause 5.4.2.2.3.
Afld	string	AF Identifier (see 3GPP TS 23.273 [38] clause 5.4.2.2.3)
LcsClientId	string	Lcs Client Identifier (see 3GPP TS 23.273 [38] clause 5.4.2.2.3)

## 6.1.6.3.3 Enumeration: DataSetName

Table 6.1.6.3.3-1: Enumeration DataSetName

Enumeration value	Description
"AM"	Access and Mobility Subscription Data
"SMF_SEL"	SMF Selection Subscription Data
"UEC_SMF"	UE Context in SMF Data
"UEC_SMSF"	UE Context in SMSF Data
"SMS_SUB"	SMS Subscription Data
"SM"	Session Management Subscription Data
"TRACE"	Trace Data
"SMS_MNG"	SMS Management Subscription Data
"LCS_PRIVACY"	LCS Privacy Subscription Data
"LCS_MO"	LCS Mobile Originated Subscription Data
"UEC_AMF"	UE Context in AMF Data
"V2X"	V2X Subscription Data
"LCS_BCA"	LCS Broadcast Assistance Subscription Data

Note: The current naming conventions for Enumerations (uppercase with underscore), when their intended usage is for query parameters is not consistent with the naming conventions for URI components

(lowercase with hyphen).

6.1.6.3.4 Void

6.1.6.3.5 Void

6.1.6.3.6 Void

# 6.1.6.3.7 Enumeration: PduSessionContinuityInd

Table 6.1.6.3.7-1: Enumeration PduScContinuity

Enumeration value	Description
"MAINTAIN_PDUSESSION"	Maintain the PDU session
"RECONNECT_PDUSESSION"	Disconnect the PDU session with a reactivation request
"RELEASE_PDUSESSION"	Disconnect PDU session without reactivation request

# 6.1.6.3.8 Enumeration: LocationPrivacyInd

Table 6.1.6.3.8-1: Enumeration LocationPrivacyInd

Enumeration value	Description
"LOCATION_DISALLOWED"	Location for UE is disallowed
"LOCATION_ALLOWED"	Location for UE are allowed

# 6.1.6.3.9 Enumeration: PrivacyCheckRelatedAction

Table 6.1.6.3.9-1: Enumeration PrivacyCheckRelatedAction

Enumeration value	Description
"LOCATION_NOT_ALLOWED"	Location not allowed
"LOCATION_ALLOWED_WITH_NOTIFICATION"	Location allowed with notification
"LOCATION_ALLOWED_WITHOUT_NOTIFICATION"	Location allowed without notification
"LOCATION_ALLOWED_WITHOUT_RESPONSE"	Location with notification and privacy verification; location allowed if no response
"LOCATION_RESTRICTED_WITHOUT_RESPONSE"	Location with notification and privacy verification; location restricted if no response

## 6.1.6.3.10 Enumeration: LcsClientClass

Table 6.1.6.3.10-1: Enumeration LcsClientClass

Enumeration value	Description
"BROADCAST_SERVICE"	LCS client broadcasting location related information
"OM_IN_HPLMN"	O&M LCS client in the HPLMN
"OM_IN_VPLMN"	O&M LCS client in the VPLMN
"ANONYMOUS_LOCATION_SERVICE"	LCS client recording anonymous location
	information
"SPECIFIC_SERVICE"	LCS Client supporting a bearer service, teleservice or supplementary service to the target UE

## 6.1.6.3.11 Enumeration: LcsMoServiceClass

Table 6.1.6.3.11-1: Enumeration LcsMoServiceClass

Enumeration value	Description
"BASIC_SELF_LOCATION"	UE requests own location
"AUTONOMOUS_SELF_LOCATION"	UE requests location assistance data
"TRANSFER_TO_THIRD_PARTY"	UE requests transfer of own location to another LCS Client

# 6.1.6.3.12 Enumeration: OperationMode

Table 6.1.6.3.12-1: Enumeration OperationMode

Enumeration value	Description
"WB_S1"	WB-S1 mode
"NB_S1"	NB-S1 mode
"WB_N1"	WB-N1 mode
"NB_N1"	NB-N1 mode

# 6.1.6.3.13 Enumeration: SorUpdateIndicator

Table 6.1.6.3.13-1: Enumeration SorUpdateIndicator

Enumeration value	Description
"INITIAL_REGISTRATION"	NAS registration type "Initial Registration"
"EMERGENCY REGISTRATION"	NAS registration type "Emergency Registration"

## 6.1.6.3.14 Enumeration: CodeWordInd

Table 6.1.6.3.14-1: Enumeration CodeWordInd

Enumeration value	Description
"CODEWORD_CHECK_IN_UE"	codeword shall be checked in UE
"CODEWORD_CHECK_IN_GMLC"	one or more codeword values to be checked in GMLC

## 6.1.6.3.15 Enumeration: MdtUserConsent

Table 6.1.6.3.15-1: Enumeration MdtUserConsent

Enumeration value	Description
"CONSENT_NOT_GIVEN"	It shall indicate the user has given his consent for MDT activation.
"CONSENT_GIVEN"	It shall indicate the user hasn't given his consent for MDT activation.

# 6.1.7 Error Handling

### 6.1.7.1 General

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

### 6.1.7.2 Protocol Errors

Protocol errors handling shall be supported as specified in clause 5.2.7 of 3GPP TS 29.500 [4].

# 6.1.7.3 Application Errors

The common application errors defined in the Table 5.2.7.2-1 in 3GPP TS 29.500 [4] may also be used for the Nudm\_SubscriberDataManagement service. The following application errors listed in Table 6.1.7.3-1 are specific for the Nudm\_SubscriberDataManagement service.

Table 6.1.7.3-1: Application errors

Application Error	HTTP status	Description
	code	
NF_CONSUMER_REDIRECT_ONE_TXN	307 Temporary	The request has been asked to be redirected to a
	Redirect	specified target for one transaction.
CONTEXT_NOT_FOUND	308 Permanent	The request has been asked to be redirected to a
	Redirect	specified target.
DATA_NOT_FOUND	404 Not Found	The requested UE subscription data is not found/does
		not exist.
		This error is applicable to all Nudm_SDM GET
		operations.
USER_NOT_FOUND	404 Not Found	The user does not exist
		This error is applicable to all Nudm_SDM GET
		operations.
CONTEXT_NOT_FOUND	404 Not Found	It is used during the modification of an existing
		subscription when no corresponding context exists.
GROUP_IDENTIFIER_NOT_FOUND	404 Not Found	The requested Group Identifier does not exist.
SUBSCRIPTION_NOT_FOUND	404 Not Found	The subscription does not exist.
UNSUPPORTED_RESOURCE_URI	501 Not	The SDM Subscription contains unsupported resource
	Implemented	URI to be monitored.

# 6.1.8 Feature Negotiation

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

**Table 6.1.8-1: Supported Features** 

Feature number	Feature Name	Description
1	SharedData	When receiving a Nudm_SDM_Get service operation request to retrieve a UE's individual subscription data, and the request does not contain a supported-features query parameter indicating support of this feature, the UDM shall not include Shared Data Ids in the response. Instead the UDM may – based on operator policy – take no further action (i.e. allow the UE to get services based on only the UE's individual subscription data), or send the shared data as individual data (this may result in notifications of individual subscription data change – if so subscribed – when shared data, which are sent as individual data, are modified, and/or when the UE's Shared Data IDs are modified).
2	ImmediateReport	When a NF consumer detects the UDM support ImmediateReport feature, it can indicate an immediateReport flag when invoking Nudm_SDM_Subscribe service operation. If UDM supports ImmediateReport received Nudm_SDM_Subscribe service operation request, it shall return the resource representation(s) of the monitored resource(s) in the service operation response body.
3	PatchReport	If some of the modifications included in the PATCH request are not successfully implemented, the UDM reports the result of PATCH request execution to the consumer. See clause 5.2.7.2 of 3GPP TS 29.500 [4].
4	Nssaa	If the NF consumer does not support this feature, the UDM shall not include information of S-NSSAI(s) subject to Network Slice-Specific Authentication and Authorization in the message body with "200 OK" response (See clause 5.2.2.2.2).
5	CAGFeature	If the NF consumer does not support this feature, the UDM shall not include CAG information list in the message body with "200 OK" response (clause 5.2.2.2.3). The UDM performs action as executes step 2c of sub clause 5.3.2.2.2 and 5.3.2.2.3 if UE is allowed to access 5GS via CAG cell(s) only.

# 6.1.9 Security

As indicated in 3GPP TS 33.501 [6] and 3GPP TS 29.500 [4], the access to the Nudm\_SDM API may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [18]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [19]) plays the role of the authorization server.

If OAuth2 is used, an NF Service Consumer, prior to consuming services offered by the Nudm\_SDM API, shall obtain a "token" from the authorization server, by invoking the Access Token Request service, as described in 3GPP TS 29.510 [19], clause 5.4.2.2.

NOTE: When multiple NRFs are deployed in a network, the NRF used as authorization server is the same NRF that the NF Service Consumer used for discovering the Nudm\_SDM service.

The Nudm\_SDM API defines a single scope "nudm-sdm" for OAuth2 authorization (as specified in 3GPP TS 33.501 [6]) for the entire API, and it does not define any additional scopes at resource or operation level.

# 6.2 Nudm\_UEContextManagement Service API

# 6.2.1 API URI

URIs of this API shall have the following root:

{apiRoot}/{apiName}/<apiVersion>/

The request URI used in HTTP request from the NF service consumer towards the NF service producer shall have the structure defined in clause 4.4.1 of 3GPP TS 29.501 [5], i.e.:

### {apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [5].
- The <apiName> shall be "nudm-uecm".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 6.2.3.

# 6.2.2 Usage of HTTP

### 6.2.2.1 General

HTTP/2, as defined in IETF RFC 7540 [13], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

HTTP/2 shall be transported as specified in clause 5.3 of 3GPP TS 29.500 [4].

HTTP messages and bodies for the Nudm\_UECM service shall comply with the OpenAPI [14] specification contained in Annex A3.

### 6.2.2.2 HTTP standard headers

### 6.2.2.2.1 General

The usage of HTTP standard headers shall be supported as specified in clause 5.2.2 of 3GPP TS 29.500 [4].

### 6.2.2.2.2 Content type

The following content types shall be supported:

JSON, as defined in IETF RFC 8259 [15], signalled by the content type "application/json".

The Problem Details JSON Object (IETF RFC 7807 [16] signalled by the content type "application/problem+json"

JSON Merge Patch, as defined in IETF RFC 7396 [17], signalled by the content type "application/merge-patch+json"

### 6.2.2.3 HTTP custom headers

### 6.2.2.3.1 General

The usage of HTTP custom headers shall be supported as specified in clause 5.2.3 of 3GPP TS 29.500 [4].

# 6.2.3 Resources

# 6.2.3.1 Overview

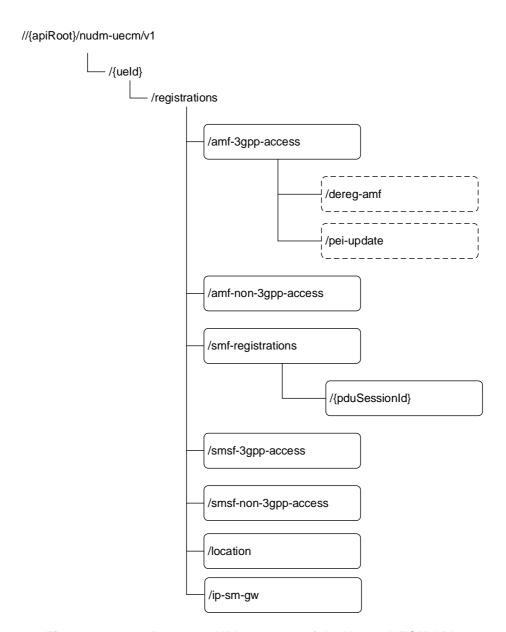


Figure 6.2.3.1-1: Resource URI structure of the Nudm\_UECM API

Table 6.2.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.2.3.1-1: Resources and methods overview

Resource name (Archetype)	Resource URI	HTTP method or custom operation	Description	
Registrations	/{ueld}/registrations	GET	Retrieve UE's registration data	
(Document)		PUT	sets Update the AMF registration for 3GPP access	
	/{ueld}/registrations/amf-3gpp-access	PATCH	Modify the AMF registration for 3GPP access	
Amf3GppAccessRegistration (Document)		GET	Retrieve the AMF registration information for 3GPP access	
(Localitativ)	/{ueld}/registrations/amf-3gpp- access/dereg-amf	dereg-amf (POST)	Trigger AMF deregistration due to mobility from 5GC to EPC	
	/{ueld}/registrations/amf-3gpp- access/pei-update	pei-update (POST)	Updates the PEI in the 3GPP Access Registration context	
		PUT	Update the AMF registration for non 3GPP access	
AmfNon3GppAccessRegistration (Document)	/{ueld}/registrations/amf-non- 3gpp-access	PATCH	Modify the AMF registration for non 3GPP access	
(Dodanishi)	ogpp doods	GET	Retrieve the AMF registration information for non 3GPP access	
SmfRegistrations (Store)	/{ueld}/registrations/smf- registrations	GET	Retrieve the SMF registration information	
		PUT	Create an SMF registration identified by PDU Session Id	
		DELETE	Delete an individual SMF registration	
IndividualSmfRegistration (Document)	/{ueld}/registrations/smf- registrations/{pduSessionId}	GET	Retrieve the SMF registration information identified by PDU Session Id.	
		PUT	Create or Update the SMSF registration	
Smsf3GppAccessRegistration (Document)	/{ueld}/registrations/smsf-3gpp-access	DELETE	Delete the SMSF registration for 3GPP access	
(Document)	access	PATCH GET	Modify the SMSF registration Retrieve the SMSF registration information	
		PUT	Create or Update the SMSF registration for non 3GPP access	
SmsfNon3GppAccessRegistration	/{ueld}/registrations/smsf-non-	DELETE	Delete the SMSF registration for non 3GPP access	
(Document)	3gpp-access	PATCH	Modify the SMSF registration for non 3GPP access	
		GET	Retrieve the SMSF registration information for non 3GPP access	
Location(Document)	/{ueld}/registrations/location	GET	Retrieve the UE's location information by GMLC or NEF	
		PUT	Create or Update the IP-SM- GW registration	
IpSmGwRegistration (Document)	/{ueld}/registrations/ip-sm-gw	DELETE	Delete the IP-SM-GW registration	
		GET	Retrieve the IP-SM-GW registration information	

# 6.2.3.2 Resource: Amf3GppAccessRegistration (Document)

# 6.2.3.2.1 Description

This resource represents the registered AMF for 3GPP access.

#### 6.2.3.2.2 Resource Definition

Resource URI: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/amf-3gpp-access

This resource shall support the resource URI variables defined in table 6.2.3.2.2-1.

Table 6.2.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.2.1
ueld		Represents the Subscription Identifier SUPI or GPSI (see 3GPP TS 23.501 [2] clause 5.9.2) SUPI (i.e. imsi or nai or gli or gci) is used with the PUT and PATCH methods; SUPI (i.e. imsi or nai) or GPSI (i.e. msisdn or extid) is used with the GET method.  pattern: See pattern of type VarUeld in 3GPP TS 29.571 [7]

## 6.2.3.2.3 Resource Standard Methods

### 6.2.3.2.3.1 PUT

This method shall support the URI query parameters specified in table 6.2.3.2.3.1-1.

Table 6.2.3.2.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.2.3.1-2 and the response data structures and response codes specified in table 6.2.3.2.3.1-3.

Table 6.2.3.2.3.1-2: Data structures supported by the PUT Request Body on this resource

Data type	Р	Cardinality	Description
Amf3GppAccess	М	1	The AMF registration for 3GPP access is replaced with the received
Registration			linformation.

Table 6.2.3.2.3.1-3: Data structures supported by the PUT Response Body on this resource

Data type	Р	Cardinality	Response codes	Description		
Amf3GppAccess Registration	M	1	201 Created	Upon success, a response body containing a representation of the created Individual Amf3GppAccessRegistration resource shall be returned.		
Amf3GppAccess Registration	M	1	200 OK	Upon success, a response body containing a representation of the updated Individual Amf3GppAccessRegistration resource shall be returned.		
n/a			204 No Content	Upon success, an empty response body shall be returned		
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND		
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors:  - UNKNOWN_5GS_SUBSCRIPTION  - NO_PS_SUBSCRIPTION  - ROAMING_NOT_ALLOWED  - ACCESS_NOT_ALLOWED  - RAT_NOT_ALLOWED  - REAUTHENTICATION_REQUIRED		
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.						

Table 6.2.3.2.3.1-4: Headers supported by the 201 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	M		Contains the URI of the newly created resource, according to the structure: {apiRoot}/nudm-uecm/v1/{ueld}/registrations/amf-3gpp-access

### 6.2.3.2.3.2 PATCH

This method shall support the URI query parameters specified in table 6.2.3.2.3.2-1.

Table 6.2.3.2.3.2-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	Р	Cardinality	Description
supported- features	SupportedFeat ures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.2.3.2.3.2-2 and the response data structures and response codes specified in table 6.2.3.2.3.2-3.

Table 6.2.3.2.3.2-2: Data structures supported by the PATCH Request Body on this resource

Data type	Р	Cardinality	Description
Amf3GppAccess	М	1	The AMF registration for 3GPP access is modified with the received
RegistrationModifi			information.
cation			

Table 6.2.3.2.3.2-3: Data structures supported by the PATCH Response Body on this resource

Data type	Р	Cardinality	Response	Description
			codes	
n/a			204 No	Upon success, an empty response body is returned. (NOTE 2)
			Content	
PatchResult	М	1	200 OK	Upon success, the execution report is returned. (NOTE 2)
ProblemDetails	0	01	403	The "cause" attribute may be used to indicate one of the
			Forbidden	following application errors:
				- INVALĬD_ĠUAMI
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the
			Found	following application errors:
				- CONTEXT NOT FOUND
				- USER_NOT_FOUND
ProblemDetails	0	01	422	The "cause" attribute may be used to indicate one of the
			Unprocessa	following application errors:
			ble Entity	- UNPROCESSABLE_REQUEST
NOTE 1: In addit	ion co	mmon data stru	ıctures as liste	d in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

NOTE 1: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.
 NOTE 2: If all the modification instructions in the PATCH request have been implemented, the UDM 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 UDM shall respond with PatchResult.

## 6.2.3.2.3.3 GET

This method shall support the URI query parameters specified in table 6.2.3.2.3.3-1.

Table 6.2.3.2.3.3-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.2.3.2.3.3-2 and the response data structures and response codes specified in table 6.2.3.2.3.3-3.

Table 6.2.3.2.3.3-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.2.3.2.3.3-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description		
Amf3GppAccess Registration	М	1	200 OK	Upon success, a response body containing the Amf3GppAccessRegistration shall be returned.		
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - CONTEXT_NOT_FOUND - USER_NOT_FOUND		
NOTE: In addition						

## 6.2.3.2.4 Resource Custom Operations

#### 6.2.3.2.4.1 Overview

Table 6.2.3.2.4.1-1: Custom operations

Operation Name	Custom operation URI	Mapped HTTP method	Description
•	/{ueld}/registrations/amf-3gpp-access/dereg-amf		Trigger AMF deregistration due to mobility from 5GC to EPC
pei-update	/{ueld}/registrations/amf-3gpp-access/pei-update		Updates PEI in the AMF 3GPP Registration context

## 6.2.3.2.4.2 Operation: dereg-amf

#### 6.2.3.2.4.2.1 Description

The dereg-amf custom operation is used by the NF service consumer (HSS) to trigger AMF deregistration due to mobility from 5GS to EPC. For details see 3GPP TS 23.632 [32].

## 6.2.3.2.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.2.3.2.4.2.2-1 and the response data structure and response codes specified in table 6.2.3.2.4.2.2-2.

Table 6.2.3.2.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	Р	Cardinality	Description
AmfDeregInfo	М	1	Contains the deregistration reason

Table 6.2.3.2.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	Р	Cardinality	Response	Description
			codes	
n/a			204 No	Upon success, an empty response body shall be returned
			Content	
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the
			Found	following application errors:
				- USER_NOT_FOUND
NOTE: The manadatory HTTP error status code for the POST method listed in Table 5.2.7.1-1 of				
3GPP TS	3 29.5	00 [4] also app	ly.	

#### 6.2.3.2.4.3 Operation: pei-update

#### 6.2.3.2.4.3.1 Description

The pei-update custom operation is used by the NF service consumer (HSS) to trigger an update of the PEI stored in the AMF 3GPP Registration context. For details see 3GPP TS 23.632 [32].

## 6.2.3.2.4.3.2 Operation Definition

This operation shall support the request data structures specified in table 6.2.3.2.4.3.2-1 and the response data structure and response codes specified in table 6.2.3.2.4.3.2-2.

Table 6.2.3.2.4.3.2-1: Data structures supported by the POST Request Body on this resource

Data type	Р	Cardinality	Description
PeiUpdateInfo	М	1	Contains the PEI provided by the NF service consumer

Table 6.2.3.2.4.3.2-2: Data structures supported by the POST Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
n/a			204 No	Upon success, an empty response body shall be returned	
			Content		
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the	
			Found	following application errors:	
				- USER_NOT_FOUND	
NOTE: The manadatory HTTP error status code for the POST method listed in Table 5.2.7.1-1 of					
3GPP TS	3 29.5	500 [4] also app	ly.		

# 6.2.3.3 Resource: AmfNon3GppAccessRegistration (Document)

# 6.2.3.3.1 Description

This resource represents the registered AMF for non 3GPP access.

## 6.2.3.3.2 Resource Definition

Resource URI: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/amf-non-3gpp-access/

This resource shall support the resource URI variables defined in table 6.2.3.3.2-1.

Table 6.2.3.3.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.2.1
ueld		Represents the Subscription Identifier SUPI or GPSI (see 3GPP TS 23.501 [2] clause 5.9.2) SUPI (i.e. imsi or nai or gli or gci) is used with the PUT and PATCH methods; SUPI (i.e. imsi or nai) or GPSI (i.e. msisdn or extid) is used with the GET method. pattern: See pattern of type VarUeId in 3GPP TS 29.571 [7]

## 6.2.3.3.3 Resource Standard Methods

## 6.2.3.3.3.1 PUT

This method shall support the URI query parameters specified in table 6.2.3.3.3.1-1.

Table 6.2.3.3.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.3.3.1-2 and the response data structures and response codes specified in table 6.2.3.3.3.1-3.

Table 6.2.3.3.3.1-2: Data structures supported by the PUT Request Body on this resource

Data type	Р	Cardinality	Description
AmfNon3GppAcc	M	1	The AMF registration for non 3GPP access is replaced with the received
essRegistration			information.

Table 6.2.3.3.3.1-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
AmfNon3GppAcc essRegistration	М	1	201 Created	Upon success, a response body containing a representation of the created Individual AmfNon3GppAccessRegistration resource shall be returned.
AmfNon3GppAcc essRegistration	М	1	200 OK	Upon success, a response body containing a representation of the updated Individual AmfNon3GppAccessRegistration resource shall be returned.
n/a			204 No Content	Upon success, an empty response body shall be returned
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors:  - UNKNOWN_5GS_SUBSCRIPTION - NO_PS_SUBSCRIPTION - ROAMING_NOT_ALLOWED - ACCESS_NOT_ALLOWED - RAT_NOT_ALLOWED - REAUTHENTICATION_REQUIRED
NOTE: In addition	on coi	mmon data stru	ctures as listed	d in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

Table 6.2.3.3.3.1-4: Headers supported by the 201 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	M		Contains the URI of the newly created resource, according to the structure: {apiRoot}/nudm-uecm/v1/{ueld}/registrations/amf-non-3gpp-access

#### 6.2.3.3.3.2 PATCH

This method shall support the URI query parameters specified in table 6.2.3.3.3.2-1.

Table 6.2.3.3.3.2-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	Ρ	Cardinality	Description
supported- features	SupportedFeat ures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.2.3.3.3.2-2 and the response data structures and response codes specified in table 6.2.3.3.3.2-3.

Table 6.2.3.3.3.2-2: Data structures supported by the PATCH Request Body on this resource

Data type	Р	Cardinality	Description
AmfNon3GppAcc	M	1	The AMF registration for non 3GPP access is modified with the received
essRegistrationM			information.
odification			

Table 6.2.3.3.3.2-3: Data structures supported by the PATCH Response Body on this resource

Р	Cardinality	Response	Description		
		codes			
		204 No	Upon success, an empty response body shall be returned.		
		Content	(NOTE 2)		
М	1	200 OK	Upon success, the execution report is returned. (NOTE 2)		
0	01	404 Not	The "cause" attribute may be used to indicate one of the		
		Found	following application errors:		
			- CONTEXT_NOT_FOUND		
			- USER_NOT_FOUND		
0	01	422	The "cause" attribute may be used to indicate one of the		
		Unprocessa	following application errors:		
		ble Entity	- UNPROCESSABLE_REQUEST		
n co	mmon data stru	ctures as liste	d in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.		
NOTE 2: If all the modification instructions in the PATCH request have been implemented, the UDM shall respond					
with 204 No Content response; if some of the modification instructions in the PATCH request have been					
			as included in the supported-feature query parameter the		
	M O	M 1 O 01 O 01 on common data strumodification instructi	Codes  204 No Content  M 1 200 OK O 01 404 Not Found  O 01 422 Unprocessa ble Entity on common data structures as liste modification instructions in the PA' No Content response; if some of t		

#### 6.2.3.3.3.3 GET

This method shall support the URI query parameters specified in table 6.2.3.3.3.1.

"PatchReport" feature number, the UDM shall respond with PatchResult.

Table 6.2.3.3.3.3-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.3.3.3-2 and the response data structures and response codes specified in table 6.2.3.3.3.3-3.

Table 6.2.3.3.3.2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.2.3.3.3.3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
AmfNon3GppAcc essRegistration	М	1	200 OK	Upon success, a response body containing the AmfNon3GppAccessRegistration shall be returned.
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - CONTEXT_NOT_FOUND - USER_NOT_FOUND
NOTE: In addition	n cor	mmon data struc	tures as lister	l in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

# 6.2.3.4 Resource: SmfRegistrations

## 6.2.3.4.1 Description

This resource is used to represent SMF registrations.

## 6.2.3.4.2 Resource Definition

Resource URI: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/smf-registrations

This resource shall support the resource URI variables defined in table 6.2.3.4.2-1.

Table 6.2.3.4.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.4.1
ueld	VarUeld	Represents the Subscription Identifier SUPI or GPSI (see 3GPP TS 23.501 [2] clause 5.9.2)
		pattern: See pattern of type VarUeld in 3GPP TS 29.571 [7]

#### 6.2.3.4.3 Resource Standard Methods

6.2.3.4.3.1 GET

This method shall support the URI query parameters specified in table 6.2.3.4.3.1-1.

Table 6.2.3.4.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6
single-nssai	Snssai	0		When present without Slice Differentiator (sd), all slices identified by the given Slice/Service Type (sst) and any sd value (if any) shall be considered matching the query parameter.
dnn	Dnn	0	01	The DNN shall be the DNN Network Identifier only.

JSON objects (such as Snssai, Dnn...) shall be included directly as part of the URI query parameters by specifying in the OpenAPI file that the "Content-Type" of such parameters is "application/json".

If "single-nssai" is not included, and "dnn" is not included, UDM shall return all SMF registrations for all DNN(s) and network slice(s).

If "single-nssai" is included, and "dnn" is not included, UDM shall return all SMF registrations for all DNN(s) and the requested network slice identified by "single-nssai".

If "single-nssai" is not included, and "dnn" is included, UDM shall return all SMF registrations for all network slices where such DNN is available.

If "single-nssai" is included, and "dnn" is included, UDM shall return the all SMF registrations identified by "dnn" and "single-nssai".

This method shall support the request data structures specified in table 6.2.3.4.3.1-2 and the response data structures and response codes specified in table 6.2.3.4.3.1-3.

Table 6.2.3.4.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.2.3.4.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description	
SmfRegistrationIn fo	М	1	200 OK	Upon success, a response body containing the SmfRegistrationInfo shall be returned.	
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be set to one of the following application errors: - CONTEXT_NOT_FOUND - USER_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

# 6.2.3.5 Resource: IndividualSmfRegistration (Document)

## 6.2.3.5.1 Resource Definition

Resource URI: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/smf-registrations/{pduSessionId}

This resource shall support the resource URI variables defined in table 6.2.3.5.1-1.

Table 6.2.3.5.1-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
ueld	VarUeld	Represents the Subscription Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) SUPI (i.e. imsi or nai or gli or gci) is used with the PUT, DELETE and PATCH methods; pattern: See pattern of type VarUeld in 3GPP TS 29.571 [7]
pduSessionId	PduSessionId	The pduSessionId identifies an individual SMF registration.

#### 6.2.3.5.2 Resource Standard Methods

# 6.2.3.5.2.1 PUT

This method shall support the URI query parameters specified in table 6.2.3.5.2.1-1.

Table 6.2.3.5.2.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.5.2.1-2 and the response data structures and response codes specified in table 6.2.3.5.2.1-3.

Table 6.2.3.5.2.1-2: Data structures supported by the PUT Request Body on this resource

Data type	Р	Cardinality	Description
SmfRegistration	М	1	The registration that is to be created

Table 6.2.3.5.2.1-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
SmfRegistration	M	1	201 Created	Upon success, a response body containing a representation of the created Individual SmfRegistration resource shall be returned.
SmfRegistration	M	1	200 OK	Upon success, a response body containing a representation of the updated Individual SmfRegistration resource shall be returned.
n/a			204 No Content	Upon success, an empty response body shall be returned
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors: - ROAMING_NOT_ALLOWED - DNN_NOT_ALLOWED
NOTE: In addit	ion cor	mmon data stru	ctures as listed	d in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

Table 6.2.3.5.2.1-4: Headers supported by the 201 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	М		Contains the URI of the newly created resource, according to the structure: {apiRoot}/nudm-uecm/v1/{ueld}/registrations/smf-registrations/{pduSessionId}

# 6.2.3.5.2.2 DELETE

This method shall support the URI query parameters specified in table 6.2.3.5.2.2-1.

Table 6.2.3.5.2.2-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	Р	Cardinality	Description
smf-set-id	NfSetId	0		The smf-set-id may be used by the UDM to guard against deletion of registrations by NFs that do not belong to the same NF set as the registered SMF.

This method shall support the request data structures specified in table 6.2.3.5.2.2-2 and the response data structures and response codes specified in table 6.2.3.5.2.2-3.

Table 6.2.3.5.2.2-2: Data structures supported by the DELETE Request Body on this resource

Data type	Р	Cardinality	Description
n/a			The request body shall be empty.

Table 6.2.3.5.2.2-3: Data structures supported by the DELETE Response Body on this resource

Data	type	Р	Cardinality	Response codes	Description	
n/a				204 No	Upon success, an empty response body shall be returned.	
				Content		
NOTE:	NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

## 6.2.3.5.2.3 GET

This method shall support the URI query parameters specified in table 6.2.3.5.2.3-1.

Table 6.2.3.5.2.3-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.5.2.3-2 and the response data structures and response codes specified in table 6.2.3.5.2.3-3.

Table 6.2.3.5.2.3-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			The request body shall be empty.

Table 6.2.3.5.2.3-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
SmfRegistration	М	1	200 OK	Upon success, a response body containing the SmfRegistration shall be returned.	
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be set to one of the following application errors: - CONTEXT_NOT_FOUND - USER_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

# 6.2.3.6 Resource: Smsf3GppAccessRegistration (Document)

# 6.2.3.6.1 Description

This resource represents the registered SMSF for 3GPP access.

## 6.2.3.6.2 Resource Definition

Resource URI: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/smsf-3gpp-access

This resource shall support the resource URI variables defined in table 6.2.3.6.2-1.

Table 6.2.3.6.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.2.1
ueld		Represents the Subscription Identifier SUPI or GPSI (see 3GPP TS 23.501 [2] clause 5.9.2) SUPI (i.e. imsi or nai or gli or gci) is used with the PUT, DELETE and PATCH methods; GPSI (i.e. msisdn or extid) is used with the GET method.  pattern: See pattern of type VarUeld in 3GPP TS 29.571 [7]

#### 6.2.3.6.3 Resource Standard Methods

## 6.2.3.6.3.1 PUT

This method shall support the URI query parameters specified in table 6.2.3.6.3.1-1.

Table 6.2.3.6.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.6.3.1-2 and the response data structures and response codes specified in table 6.2.3.6.3.1-3.

Table 6.2.3.6.3.1-2: Data structures supported by the PUT Request Body on this resource

Data type	Р	Cardinality	Description
SmsfRegistration	М	1	The SMSF registration for 3GPP access is created or updated with the
			received information.

Table 6.2.3.6.3.1-3: Data structures supported by the PUT Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
SmsfRegistration	М	1	201 Created	Upon success, a response body containing a representation of the created Individual SmsfRegistration resource shall be returned.
SmsfRegistration	М	1	200 OK	Upon success, a response body containing a representation of the updated Individual SmsfRegistration resource shall be returned.
n/a			204 No Content	Upon success, an empty response body shall be returned
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors: - UNKNOWN_5GS_SUBSCRIPTION - ACCESS_NOT_ALLOWED - ROAMING_NOT_ALLOWED
NOTE: In addition	n cor	mmon data stru	ctures as listed	in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

Table 6.2.3.6.3.1-4: Headers supported by the 201 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	М	1	Contains the URI of the newly created resource, according to
				the structure: {apiRoot}/nudm-
				uecm/v1/{ueld}/registrations/smsf-3gpp-access

# 6.2.3.6.3.2 DELETE

This method shall support the URI query parameters specified in table 6.2.3.6.3.2-1.

Table 6.2.3.6.3.2-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	Р	Cardinality	Description
smsf-set-id	NfSetId	0		The smsf-set-id may be used by the UDM to guard against deletion of registrations by NFs that do not belong to the same NF set as the registered SMSF.

This method shall support the request data structures specified in table 6.2.3.6.3.2-2 and the response data structures and response codes specified in table 6.2.3.6.3.2-3.

Table 6.2.3.6.3.2-2: Data structures supported by the DELETE Request Body on this resource

Data type	Р	Cardinality	Description
n/a			The request body shall be empty.

Table 6.2.3.6.3.2-3: Data structures supported by the DELETE Response Body on this resource

D	ata type	Р	Cardinality	Response	Description	
				codes		
n/a				204 No	Upon success, an empty response body shall be returned.	
				Content		
NOTE	NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

6.2.3.6.3.3 GET

This method shall support the URI query parameters specified in table 6.2.3.6.3.3-1.

Table 6.2.3.6.3.3-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.2.3.6.3.3-2 and the response data structures and response codes specified in table 6.2.3.6.3.3-3.

Table 6.2.3.6.3.3-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.2.3.6.3.3-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
SmsfRegistration	М	1	200 OK	Upon success, a response body containing the SmsfRegistration shall be returned.
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - CONTEXT_NOT_FOUND - USER_NOT_FOUND
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.				

# 6.2.3.7 Resource: SmsfNon3GppAccessRegistration (Document)

## 6.2.3.7.1 Description

This resource represents the registered SMSF for non 3GPP access.

### 6.2.3.7.2 Resource Definition

 $Resource\ URI:\ \{apiRoot\}/nudm-uecm/v1/\{ueId\}/registrations/smsf-non-3gpp-access$ 

This resource shall support the resource URI variables defined in table 6.2.3.7.2-1.

Table 6.2.3.7.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.2.1
ueld		Represents the Subscription Identifier SUPI or GPSI (see 3GPP TS 23.501 [2] clause 5.9.2) SUPI (i.e. imsi or nai or gli or gci) is used with the PUT, DELETE and PATCH methods; GPSI (i.e. msisdn or extid) is used with the GET method. pattern: See pattern of type VarUeld in 3GPP TS 29.571 [7]

## 6.2.3.7.3 Resource Standard Methods

#### 6.2.3.7.3.1 PUT

This method shall support the URI query parameters specified in table 6.2.3.7.3.1-1.

Table 6.2.3.7.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.7.3.1-2 and the response data structures and response codes specified in table 6.2.3.7.3.1-3.

Table 6.2.3.7.3.1-2: Data structures supported by the PUT Request Body on this resource

Data type	Р	Cardinality	Description
SmsfRegistration	M	1	The SMSF registration for non 3GPP access is created or updated with the
			received information.

Table 6.2.3.7.3.1-3: Data structures supported by the PUT Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
SmsfRegistration	М	1	201 Created	Upon success, a response body containing a representation of the created Individual SmsfRegistration for non 3GPP access resource shall be returned.
SmsfRegistration	М	1	200 OK	Upon success, a response body containing a representation of the updated Individual SmsfRegistration for non 3GPP access resource shall be returned.
n/a			204 No Content	Upon success, an empty response body shall be returned
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: The "cause" attribute shall be set to the following application error: - USER_NOT_FOUND
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors: - UNKNOWN_5GS_SUBSCRIPTION - ACCESS_NOT_ALLOWED - ROAMING_NOT_ALLOWED
NOTE: In addition	on cor	mmon data stru	ctures as listed	d in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

Table 6.2.3.7.3.1-4: Headers supported by the 201 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	M		Contains the URI of the newly created resource, according to the structure: {apiRoot}/nudm-uecm/v1/{ueld}/registrations/smsf-non-3gpp-access

### 6.2.3.7.3.2 DELETE

This method shall support the URI query parameters specified in table 6.2.3.7.2.2-1.

Table 6.2.3.7.2.2-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	Р	Cardinality	Description
smsf-set-id	NfSetId	0		The smsf-set-id may be used by the UDM to guard against deletion of registrations by NFs that do not belong to the same NF set as than the registered SMSF.

This method shall support the request data structures specified in table 6.2.3.7.2.2-2 and the response data structures and response codes specified in table 6.2.3.5.2.2-3.

Table 6.2.3.7.2.2-2: Data structures supported by the DELETE Request Body on this resource

Data type	Р	Cardinality	Description
n/a			The request body shall be empty.

### Table 6.2.3.7.2.2-3: Data structures supported by the DELETE Response Body on this resource

Dat	ta type	Р	Cardinality	Response codes	Description			
n/a				204 No	Upon success, an empty response body shall be returned.			
				Content				
NOTE:	NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.							

#### 6.2.3.7.3.3 GET

This method shall support the URI query parameters specified in table 6.2.3.7.3.3-1.

Table 6.2.3.7.3.3-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.2.3.7.3.3-2 and the response data structures and response codes specified in table 6.2.3.7.3.3-3.

Table 6.2.3.7.3.3-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

### Table 6.2.3.7.3.3-3: Data structures supported by the GET Response Body on this resource

200 OK	Upon success, a response body containing the
	SmsfRegistration shall be returned.
1 404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - CONTEXT_NOT_FOUND - USER_NOT_FOUND
	on data structures as liste

# 6.2.3.8 Resource: Location

### 6.2.3.8.1 Description

This resource is used to represent UE's location information.

### 6.2.3.8.2 Resource Definition

Resource URI: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/location

This resource shall support the resource URI variables defined in table 6.2.3.8.2-1.

Table 6.2.3.8.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.4.1
ueld	VarUeld	Represents the Subscription Identifier SUPI or GPSI (see 3GPP TS 23.501 [2] clause 5.9.2)
		pattern: See pattern of type VarUeld in 3GPP TS 29.571 [7]

### 6.2.3.8.3 Resource Standard Methods

6.2.3.8.3.1 GET

This method shall support the URI query parameters specified in table 6.2.3.8.3.1-1.

Table 6.2.3.8.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.2.3.8.3.1-2 and the response data structures and response codes specified in table 6.2.3.8.3.1-3.

Table 6.2.3.8.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.2.3.8.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
LocationInfo	М	1	200 OK	Upon success, a response body containing the locationInfo shall be returned.	
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - CONTEXT_NOT_FOUND - USER_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

# 6.2.3.9 Resource: Registrations

### 6.2.3.9.1 Description

This resource represents the UE's registration data sets.

### 6.2.3.9.2 Resource Definition

 $Resource\ URI:\ \{apiRoot\}/nudm-uecm/v1/\{ueId\}/registrations$ 

This resource shall support the resource URI variables defined in table 6.2.3.9.2-1.

Table 6.2.3.9.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 6.2.1
	Represents the Subscription Identifier SUPI or GPSI (see 3GPP TS 23.501 [2] clause 5.9.2) SUPI (i.e. imsi or nai) or GPSI (i.e. msisdn or extid) is used with the GET method. pattern: "(imsi-[0-9]{5,15} nai+ msisdn-[0-9]{5,15} extid-[^@]+@[^@]+ .+)"

### 6.2.3.9.3 Resource Standard Methods

### 6.2.3.9.3.1 GET

This method shall support the URI query parameters specified in table 6.2.3.9.3.1-1.

NOTE: The retrieval of these registration data sets can also be achieved by sending individual GET requests to the corresponding sub-resources under the {ueId}/registrations resource. When multiple registration data sets need to be retrieved by the NF Service consumer, it is recommended to use a single GET request with query parameters rather than issuing multiple GET requests.

Table 6.2.3.9.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
registration-dataset-	array(Registration	0	2N	If included, this IE shall contain the names of registration
names	DataSetName)			data sets to be retrieved.
supported-features	SupportedFeatures	0	01	see 3GPP TS 29.500 [4] clause 6.6
single-nssai	Snssai	0	01	Only applicable if registration-dataset-names contains SMF_PDU_SESSIONS When present without Slice Differentiator (sd), all slices identified by the given Slice/Service Type (sst) and any sd value (if any) shall be considered matching the query parameter.
dnn	Dnn	0	01	The DNN shall be the DNN Network Identifier only. Only applicable if registration-dataset-names contains SMF_PDU_SESSIONS

This method shall support the request data structures specified in table 6.2.3.9.3.1-2 and the response data structures and response codes specified in table 6.2.3.9.3.1-3.

Table 6.2.3.9.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.2.3.9.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response	Description	
			codes		
RegistrationData	M	1	200 OK	Upon success, a response body containing all the requested	
Sets				UE registration data sets shall be returned.	
ProblemDetails	0	01	404 Not	The "cause" attribute shall be set to one of the following	
			Found	application errors:	
				- CONTEXT_NOT_FOUND	
				- USER_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

6.2.3.10 Resource: IpSmGwRegistration

# 6.2.3.10.1 Description

This resource represents the registered IP-SM-GW.

### 6.2.3.10.2 Resource Definition

Resource URI: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/ip-sm-gw

This resource shall support the resource URI variables defined in table 6.2.3.10.2-1.

Table 6.2.3.10.2-1: Resource URI variables for this resource

Name	Definition						
apiRoot	See clause 6.2.1						
ueld	Represents the Subscription Identifier (SUPI).						
	pattern: "(imsi-[0-9]{5,15} nai+ .+)"						

### 6.2.3.10.3 Resource Standard Methods

6.2.3.10.3.1 PUT

This method shall support the URI query parameters specified in table 6.2.3.10.3.1-1.

Table 6.2.3.10.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.10.3.1-2 and the response data structures and response codes specified in table 6.2.3.10.3.1-3.

Table 6.2.3.10.3.1-2: Data structures supported by the PUT Request Body on this resource

Data type	Р	Cardinality	Description
<b>IpSmGwRegistrati</b>	M	1	The IP-SM-GW registration is created or updated with the received
on			information.

Table 6.2.3.10.3.1-3: Data structures supported by the PUT Response Body on this resource

Data type	Р	Cardinality	Response	Description
			codes	
IpSmGwRegistrati	M	1	201	Upon success, a response body containing a representation of
on			Created	the created IpSmGwRegistration resource shall be returned.
<b>IpSmGwRegistrati</b>	М	1	200 OK	Upon success, a response body containing a representation of
on				the updated IpSmGwRegistration resource shall be returned.
n/a			204 No	Upon success, an empty response body shall be returned
			Content	
ProblemDetails	0	01	403	The "cause" attribute may be used to indicate any of the
			Forbidden	following application errors:
				- UNKNOWN_5GS_SUBSCRIPTION
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate any of the
			Found	following application errors:
				- USER_NOT_FOUND

### 6.2.3.10.3.2 DELETE

This method shall support the URI query parameters specified in table 6.2.3.10.3.2-1.

Table 6.2.3.10.3.2-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.10.3.2-2 and the response data structures and response codes specified in table 6.2.3.10.3.2-3.

### Table 6.2.3.10.3.2-2: Data structures supported by the DELETE Request Body on this resource

Data type	Р	Cardinality	Description
n/a			The request body shall be empty.

### Table 6.2.3.10.3.2-3: Data structures supported by the DELETE Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
n/a			204 No Content	Upon success, an empty response body shall be returned.

6.2.3.10.3.3 GET

This method shall support the URI query parameters specified in table 6.2.3.10.3.3-1.

### Table 6.2.3.10.3.3-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.10.3.3-2 and the response data structures and response codes specified in table 6.2.3.10.3.3-3.

### Table 6.2.3.10.3.3-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

# Table 6.2.3.10.3.3-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response	Description
			codes	
<b>IpSmGwRegistrati</b>	М	1	200 OK	Upon success, a response body containing the
on				lpSmGwRegistration shall be returned.
ProblemDetails	0	01	404 Not	The "cause" attribute may be set to indicate any of the following
			Found	application errors:
				- USER_NOT_FOUND
				- CONTEXT_NOT_FOUND

# 6.2.4 Custom Operations without associated resources

### 6.2.4.1 Overview

Table 6.2.4.1-1: Custom operations without associated resources

Operation Name	Custom operation URI	Mapped HTTP method	Description
Trigger P-CSCF Restoration	/restore-pcscf		The UDM notifies the registered AMFs and SMFs that have subscribed (implicitly by providing a callback URI during registration) to receive notifications about P-CSCF Restoration.

# 6.2.4.2 Operation: Trigger P-CSCF Restoration

## 6.2.4.2.1 Description

This custom operation is used by the NF service consumer (HSS) to trigger P-CSCF restoration.

### 6.2.4.2.2 Operation Definition

This operation shall support the data structures and response codes specified in tables 6.2.4.2.2-1 and 6.2.4.2.2-2.

Table 6.2.4.2.2-1: Data structures supported by the Request Body

Data type	Р	Cardinality	Description
TriggerRequest	М	1	Identifies the subscriber for whom P-CSCF Restoration is requested

Table 6.2.4.2.2-2: Data structures supported by the POST Response Body

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Upon success, an empty response body shall be returned.
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - CONTEXT_NOT_FOUND

## 6.2.5 Notifications

### 6.2.5.1 General

This clause will specify the use of notifications and corresponding protocol details if required for the specific service. When notifications are supported by the API, it will include a reference to the general description of notifications support over the 5G SBIs specified in TS 29.500 / TS 29.501.

Table 6.2.5.1-1: Notifications overview

Notification	Resource URI	HTTP method or custom operation	Description (service operation)
Deregistration Notification	{deregCallbackUri}	POST	
P-CSCF Restoration Notification	{pcscfRestorationCallbackUri}	POST	

### 6.2.5.2 Deregistration Notification

The POST method shall be used for Deregistration Notifications and the URI shall be as provided during the registration procedure.

Resource URI: {callbackReference}

Support of URI query parameters is specified in table 6.2.5.2-1.

Table 6.2.5.2-1: URI query parameters supported by the POST method

Name	Data type	Р	Cardinality	Description
n/a				

Support of request data structures is specified in table 6.2.5.2-2 and of response data structures and response codes is specified in table 6.2.5.2-3.

Table 6.2.5.2-2: Data structures supported by the POST Request Body

Data type	Р	Cardinality	Description
DeregistrationDat	M	1	Includes Deregistration Reason
a			

Table 6.2.5.2-3: Data structures supported by the POST Response Body

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Upon success, an empty response body shall be returned.
ProblemDetails	0	01	307 Temporary Redirect	This represents the case when the related UE context is not fully available at the target NF Service Consumer (e.g. AMF) during a planned maintenance case (e.g. AMF planned maintenance without UDSF case). The "cause" attribute shall be set to the following application error: - NF_CONSUMER_REDIRECT_ONE_TXN  See table 6.2.7.3-1 for the description of this error.  The Location header of the response shall be set to the new Callback URI of the target NF Service Consumer (e.g. AMF) to which the request is redirected.
ProblemDetails	0	01	308 Permanent Redirect	This represents the case when the related UE is not found in the NF Service Consumer (e.g AMF) and the NF Service Consumer knows which NF Service Consumer is serving the UE. The "cause" attribute shall be set to the following application error:  - CONTEXT_NOT_FOUND  See table 6.2.7.3-1 for the description of this error.  The Location header of the response shall be set to the new Callback URI of the target NF Service Consumer (e.g AMF) to which the request is redirected.
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - CONTEXT_NOT_FOUND
NOTE: In addition	n cor	nmon data stru	ctures as listed	d in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

Table 6.2.5.2-4: Headers supported by the 307 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	M	1	Contains the new Callback URI of the target NF Service
				Consumer (e.g. AMF) to which the request is redirected
3gpp-Sbi-Target-	string	0	01	Identifier of the target NF (service) instance ID towards which
Nf-Id				the request is redirected

Table 6.2.5.2-5: Headers supported by the 308 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	М		Contains the new Callback URI of the target NF Service Consumer (e.g. AMF) to which the request is redirected
3gpp-Sbi-Target- Nf-Id	string	0		Identifier of the target NF (service) instance ID towards which the request is redirected

### 6.2.5.3 P-CSCF Restoration Notification

The POST method shall be used for P-CSCF Restoration Notifications and the URI shall be as provided during the registration procedure.

Resource URI: {callbackReference}

Support of URI query parameters is specified in table 6.2.5.3-1.

Table 6.2.5.3-1: URI query parameters supported by the POST method

Name	Data type	Р	Cardinality	Description				
n/a								

Support of request data structures is specified in table 6.2.5.3-2 and of response data structures and response codes is specified in table 6.2.5.3-3.

Table 6.2.5.3-2: Data structures supported by the POST Request Body

Data type	Р	Cardinality	Description
PcscfRestoration	М	1	contains the SUPI
Notification			

Table 6.2.5.3-3: Data structures supported by the POST Response Body

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Upon success, an empty response body shall be returned.
ProblemDetails	0	01	307 Temporary Redirect	This represents the case when the related UE context is not fully available at the target NF Service Consumer (e.g. AMF) during a planned maintenance case (e.g. AMF planned maintenance without UDSF case). The "cause" attribute shall be set to the following application error:  - NF_CONSUMER_REDIRECT_ONE_TXN
				See table 6.2.7.3-1 for the description of this error.  The Location header of the response shall be set to the new Callback URI of the target NF Service Consumer (e.g. AMF) to which the request is redirected.
ProblemDetails	0	01	308 Permanent Redirect	This represents the case when the related UE is not found in the NF Service Consumer (e.g AMF) and the NF Service Consumer knows which NF Service Consumer is serving the UE. The "cause" attribute shall be set to the following application error:  - CONTEXT_NOT_FOUND  See table 6.2.7.3-1 for the description of this error.
				The Location header of the response shall be set to the new Callback URI of the target NF Service Consumer (e.g AMF) to which the request is redirected.
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - CONTEXT_NOT_FOUND
ProblemDetails	0	01	409 Conflict	The "cause" attribute may be used to indicate one of the following application errors: - TEMPORARY_REJECT_REGISTRATION_ONGOING - TEMPORARY_REJECT_HANDOVER_ONGOING
NOTE: In addition	n cor	mmon data stru	ctures as listed	d in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

Table 6.2.5.3-4: Headers supported by the 307 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	M		Contains the new Callback URI of the target NF Service Consumer (e.g. AMF) to which the request is redirected
3gpp-Sbi-Target- Nf-Id	string	0	01	Identifier of the target NF (service) instance ID towards which the request is redirected

Table 6.2.5.3-5: Headers supported by the 308 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	М	1	Contains the new Callback URI of the target NF Service
				Consumer (e.g. AMF) to which the request is redirected
3gpp-Sbi-Target-	string	0	01	Identifier of the target NF (service) instance ID towards which
Nf-Id				the request is redirected

# 6.2.6 Data Model

## 6.2.6.1 General

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

Table 6.2.6.1-1 specifies the data types defined for the Nudm\_UECM service API.

Table 6.2.6.1-1: Nudm\_UECM specific Data Types

Data type	Clause defined	Description
Amf3GppAccessRegistration	6.2.6.2.2	The complete set of information relevant to the AMF where the UE has registered via 3GPP access.
AmfNon3GppAccessRegistration	6.2.6.2.3	The complete set of information relevant to the AMF where the UE has registered via non 3GPP access.
SmfRegistration	6.2.6.2.4	The complete set of information relevant to an SMF serving the UE
SmsfRegistration	6.2.6.2.6	The complete set of information relevant to the SMSF serving the UE.
DeregistrationData	6.2.6.2.5	Data sent with the Deregistration Notification
Amf3GppAccessRegistrationModification	6.2.6.2.7	Contains attributes of Amf3GppAccessRegistration that can be modified using PATCH
	6.2.6.2.8	Contains attributes of AmfNon3GppAccessRegistration that can be modified using PATCH
PcscfRestorationNotification	6.2.6.2.9	Information sent to the AMF or SMF when P-CSCF restoration is triggered.
NetworkNodeDiameterAddress	6.2.6.2.10	
EpslwkPgw	6.2.6.2.11	
TriggerRequest	6.2.6.2.12	
AmfDeregInfo	6.2.6.2.13	
EpsInterworkingInfo	6.2.6.2.14	
LocationInfo	6.2.6.2.15	Information used by (H)GMLC to send Location Service Request
RegistrationLocationInfo	6.2.6.2.16	Serving AMF, optional VGMLC and access type related informations used by (H)GMLC to send Location Request
VgmlcAddress	6.2.6.2.17	The address(es) of VGMLC
PeiUpdateInfo	6.2.6.2.18	
RegistrationDataSets	6.2.6.2.19	
IpSmGwRegistration	6.2.6.2.20	
PurgeFlag	6.2.6.3.2	This flag indicates whether or not the NF has deregistered.
E164Number	6.2.6.3.2	
DualRegistrationFlag	6.2.6.3.2	Dual Registration Flag
DeregistrationReason	6.2.6.3.3	
ImsVoPs	6.2.6.3.4	
RegistrationReason	6.2.6.3.5	
RegistrationDataSetName	6.2.6.3.6	

Table 6.2.6.1-2 specifies data types re-used by the Nudm\_uecm service API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nudm\_uecm service API.

Table 6.2.6.1-2: Nudm\_UECM re-used Data Types

Data type	Reference	Comments
Dnn	3GPP TS 29.571 [7]	Data Network Name with Network Identifier only.
NfInstanceId	3GPP TS 29.571 [7]	Network Function Instance Identifier
PduSessionId	3GPP TS 29.571 [7]	PDU Session ID
Pei	3GPP TS 29.571 [7]	Permanent Equipment Identifier
ProblemDetails	3GPP TS 29.571 [7]	Common data type used in response bodies
Uri	3GPP TS 29.571 [7]	Uniform Resource Identifier
SupportedFeatures	3GPP TS 29.571 [7]	see 3GPP TS 29.500 [4] clause 6.6
Supi	3GPP TS 29.571 [7]	see 3GPP TS 23.501 [2] clause 5.9.2
Guami	3GPP TS 29.571 [7]	Globally Unique AMF Identifier
Plmnld	3GPP TS 29.571 [7]	PLMN Identity
DiameterIdentity	3GPP TS 29.571 [7]	
AccessType	3GPP TS 29.571 [7]	Access Type
BackupAmfInfo	3GPP TS 29.571 [7]	Backup AMFs
ServiceName	3GPP TS 29.510 [19]	
PatchResult	3GPP TS 29.571 [7]	
Gpsi	3GPP TS 29.571 [7]	Generic Public Subscription Identitfier
Ipv4Addr	3GPP TS 29.571 [7]	IPv4 address
Ipv6Addr	3GPP TS 29.571 [7]	IPv6 address
Fqdn	3GPP TS 29.510 [19]	Fully Qualified Domain Name
Snssai	3GPP TS 29.571 [7]	Single NSSAI

# 6.2.6.2 Structured data types

## 6.2.6.2.1 Introduction

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

6.2.6.2.2 Type: Amf3GppAccessRegistration

Table 6.2.6.2.2-1: Definition of type Amf3GppAccessRegistration

Attribute name	Data type	Р	Cardinality	Description
amfInstanceId	NfInstanceId	М	1	The identity the AMF uses to register in the NRF.
deregCallbackUri	Uri	М	1	A URI provided by the AMF to receive (implicitly subscribed) notifications on deregistration.  The deregistration callback URI shall have unique information within AMF set to identify the UE to be deregistered.
guami	Guami	M	1	This IE shall contain the serving AMF's GUAMI.
ratType	RatType	М	1	This IE shall indicate the current RAT type of the UE.
supportedFeatures	SupportedFeatur es	0	01	See clause 6.2.8 These are the features supported by the AMF.
purgeFlag	PurgeFlag	0	01	This flag indicates whether or not the AMF has deregistered. It shall not be included in the Registration service operation.
pei	Pei	0	01	Permanent Equipment Identifier. Absence of PEI indicates that the PEI is not available at the AMF. In this case the UDM/UDR shall not delete the PEI value stored from a previous registration.
imsVoPs	ImsVoPs	0	01	Indicates per UE if "IMS Voice over PS Sessions" is homogeneously supported in all TAs in the serving AMF, or homogeneously not supported, or if support is non-homogeneous/unknown. Absence of this attribute shall be interpreted as "non homogenous or unknown" support.
amfServiceNameDereg	ServiceName	0	01	When present, this IE shall contain the name of the AMF service to which the Deregistration Notification is to be sent (see clause 6.5.2.2 of 3GPP TS 29.500 [4]).
pcscfRestorationCallba ckUri	Uri	0	01	A URI provided by the AMF to receive (implicitly subscribed) notifications on the need for P-CSCF Restoration.
amfServiceNamePcscf Rest	ServiceName	0	01	When present, this IE shall contain the name of the AMF service to which P-CSCF Restoration Notifications are to be sent (see clause 6.5.2.2 of 3GPP TS 29.500 [4]). This IE may be included if pcscfRestorationCallbackUri is present.
initialRegistrationInd	boolean	С	01	This IE shall be included by the AMF and set to true if the UE performs an Initial Registration. If the UE does not perform initial registration it shall be absent or set to false. When present and true, the UDM+HSS is requested to cancel previous registration in SGSN, if any.  Not applicable for Nudr and Nudm_UECM GET operation.  (NOTE 2)
backupAmfInfo	array(BackupAmf Info)	С	1N	This IE shall be included if the NF service consumer is an AMF and the AMF supports the AMF management without UDSF for the first interaction with UDM.  The UDM uses this attribute to do an NRF query in order to invoke later services in a backup AMF, e.g. Namf_EventExposure.
drFlag	DualRegistration Flag	0	01	Dual Registration flag. When present and true, this flag indicates that the UDM+HSS is requested not to send S6a-CLR to the registered MME/SGSN (if any). Otherwise, the registered MME (if any) shall be cancelled.  Not applicable for Nudr and Nudm_UECM GET operation.
urrpIndicator	boolean	0	01	This IE indicates whether "UE_REACHABILITY_FOR_SMS" event for this user has been subscribed or not: - true: the event has been subscribed - false, or absence of this attribute: the event for this user is currently not subscribed (NOTE 1)

		1	1	
amfEeSubscriptionId	string	С	01	Shall be present if urrpIndicator is true and the UDM has subscribed to ReachabilityReport event for "UE Reachability for DL Traffic" at the AMF to receive One-Time UE Activity notification. It contains the subscription Id allocated by the AMF as received by the UDM as part of the HTTP "Location" header of the Namf_EventExposure_Subscribe response. The UDM shall make use of the Nudr_DataRepository Update service operation (see 3GPP TS 29.504 [9]) to store the amfEeSubscription Id in the UDR.
epsInterworkingInfo	EpsInterworkingI nfo	С	01	This IE shall be included if the AMF has determined per APN/DNN which PGW-C+SMF is selected for EPS interworking with N26 and the AMF supports EPS interworking of non-3GPP access. For each APN/DNN, only one PGW-C+SMF shall be selected by the AMF for EPS interworking.
ueSrvccCapability	boolean	0	01	This IE indicates whether the UE supports 5G SRVCC: - true: 5G SRVCC is supported by the UE and AMF; - false, or absence of this attribute: 5G SRVCC is not supported.
registrationTime	DateTime	С	01	Time of Amf3GppAccessRegistration. Shall be present when used on Nudr.
vgmlcAddress	VgmlcAddress	0	01	Address of the VGMLC
contextInfo	ContextInfo	C	01	This IE if present may contain e.g. the headers received by the UDM along with the 3GppAccessRegistration. Shall be absent on Nudm and may be present on Nudr
noEeSubscriptionInd	boolean	0	01	This IE shall be absent on Nudr and may be present on Nudm. This indication is used by UDM to restore any possible ongoing subscription lost, as specified in clause 5.3.2.2.2.  When present, this IE shall indicate whether AMF does not have event exposure subscriptions in UE Context:  - true: No Event Exposure subscription existing in UE Context in AMF.  - false (default): Event Exposure subscription(s) exist in UE Context in AMF.

NOTE 1: The urrpIndicator attribute shall only be exposed over the Nudr SBI, and it shall not be included by the AMF.

NOTE 2: Regardless of the Dual Registration Flag, the SGSN, if any, is required to be cancelled (see 3GPP TS 23.502 [3] clause 4.11.5.2)

6.2.6.2.3 Type: AmfNon3GppAccessRegistration

Table 6.2.6.2.3-1: Definition of type AmfNon3GppAccessRegistration

Attribute name	Data type	Р	Cardinalit v	Description
amfInstanceId	NfInstanceId	М	1	The identity the AMF uses to register in the NRF.
deregCallbackUri	Uri	М	1	A URI provided by the AMF to receive (implicitly subscribed) notifications on deregistration.  The deregistration callback URI shall have unique information within AMF set to identify the UE to be deregistered.
guami	Guami	М	1	This IE shall contain the serving AMF's GUAMI.
ratType	RatType	М	1	This IE shall indicate the current RAT type of the UE.
supportedFeatures	SupportedFeat ures	0	01	See clause 6.2.8 These are the features supported by the AMF.
purgeFlag	PurgeFlag	0	01	This flag indicates whether or not the AMF has deregistered. It shall not be included in the Registration service operation.
pei	Pei	0	01	Permanent Equipment Identifier Absence of PEI indicates that the PEI is not available at the AMF. In this case the UDM/UDR shall not delete the PEI value stored from a previous registration.
imsVoPs	ImsVoPs	M	1	Indicates per UE if "IMS Voice over PS Sessions" is supported, or not supported. The value NON_HOMOGENEOUS_OR_UNKNOWN is not applicable.
amfServiceNameDereg	ServiceName	0	01	When present, this IE shall contain the name of the AMF service to which the Deregistration Notification is to be sent (see clause 6.5.2.2 of 3GPP TS 29.500 [4]).
pcscfRestorationCallbackUri	Uri	0	01	A URI provided by the AMF to receive (implicitly subscribed) notifications on the need for P-CSCF Restoration.
amfServiceNamePcscfRest	ServiceName	0	01	When present, this IE shall contain the name of the AMF service to which P-CSCF Restoration Notifications are to be sent (see clause 6.5.2.2 of 3GPP TS 29.500 [4]). This IE may be included if pcscfRestorationCallbackUri is present.
backupAmfInfo	array(BackupA mfInfo)	С	1N	This IE shall be included if the NF service consumer is an AMF and the AMF supports the AMF management without UDSF for the first interaction with UDM.  The UDM uses this attribute to do an NRF query in order to invoke later services in a backup AMF, e.g. Namf_EventExposure.
urrpIndicator	boolean	0	01	This IE indicates whether  "UE_REACHABILITY_FOR_SMS" event for this user has been subscribed or not: - true: the event has been subscribed - false, or absence of this attribute: the event for this user is currently not subscribed

amfEeSubscriptionId	string	С	01	Shall be present if urrpIndicator is true and the UDM has subscribed to Reachability-Report event for "UE Reachable for DL Traffic" at the AMFto receive One-Time UE Activity notification. It contains the subscription Id allocated by the AMF as received by the UDM as part of the HTTP "Location" header of the Namf_EventExposure_Subscribe response. The UDM shall make use of the Nudr_DataRepository Update service operation (see 3GPP TS 29.504 [9]) to store the amfEeSubscription Id in the UDR.
registrationTime	DateTime	С	01	Time of AmfNon3GppAccessRegistration. Shall be present when used on Nudr.
vgmlcAddress	VgmlcAddress	0	01	Address of the VGMLC
contextInfo	ContextInfo	С	01	This IE if present may contain e.g. the headers received by the UDM along with AmfNon3GppRegistration. Shall be absent on Nudm and may be present on Nudr.
noEeSubscriptionInd	boolean	0	01	This IE shall be absent on Nudr and may be present on Nudm. This indication is used by UDM to restore any possible ongoing subscription lost, as specified in clause 5.3.2.2.3.  When present, this IE shall indicate whether AMF does not have event exposure subscriptions in UE Context:  - true: No Event Exposure subscription
NOTE: The urrpIndicat	or attribute shall on	ly be	exposed	existing in UE Context in AMF false (default): Event Exposure subscription(s) exist in UE Context in AMF. over the Nudr SBI, and it shall not be included by

6.2.6.2.4 Type: SmfRegistration

Table 6.2.6.2.4-1: Definition of type SmfRegistration

Attribute name	Data type	Р	Cardinality	Description
smfInstanceId	NfInstanceId	М	1	NF Instance Id of the SMF
smfSetId	NfSetId	С	01	This IE shall be present if the SMF belongs to a SMF SET.  If present, it indicates the NF Set ID of SMF Set.
supportedFeatures	SupportedFea tures	0	01	See clause 6.2.8 These are the features supported by the SMF.
pduSessionId	PduSessionId	М	1	PDU Session ID
singleNssai	Snssai	M	1	A single Network Slice Selection Assistance Information
dnn	Dnn	С	01	Data Network Name; shall be present if emergencyServices is false or absent. When present, this IE shall contain the Network Identifier only.
emergencyServices	boolean	С	01	Indication of Emergency Services; absence indicates false.
pcscfRestorationCallbackUri	Uri	0	01	a URI provided by the SMF to receive (implicitly subscribed) notifications on the need for P-CSCF Restoration
plmnld	Plmnld	М	1	Serving node PLMN identity.
pgwFqdn	string	С	01	FQDN of the PGW in the "PGW-C+SMF", to be included for interworking with EPS.
epdgInd	boolean	0	01	Indicate whether access is from ePDG. true: access from ePDG. false or absent: not access from ePDG
deregCallbackUri	Uri		01	A URI provided by the SMF to receive (implicitly subscribed) notifications on deregistration. The deregistration callback URI shall have unique information within SMF set to identify the UE to be deregistered.
registrationReason	RegistrationR eason	0	01	Indicates registration reason.
registrationTime	DateTime	С	01	Time of SmfRegistration. Shall be present when used on Nudr.
contextInfo	ContextInfo	С	01	This IE if present may contain e.g. the headers received by the UDM along with the SmfRegistration. Shall be absent on Nudm and may be present on Nudr.

6.2.6.2.5 Type: DeregistrationData

Table 6.2.6.2.5-1: Definition of type DeregistrationData

Attribute name	Data type	Р	Cardinality	Description
deregReason	Deregistration Reason	М	1	String; see clause 6.2.6.3.3
accessType	AccessType	С	01	Access type where the UE is deregistered. Shall be present in Deregistration Notifications sent to the AMF.
pduSessionId	PduSessionId	С	01	It shall be present if the deregistration of SMF happens. If present, indicates PDU Session ID for which old SMF is deregistered.
newSmfInstanceId	NfInstanceId	0	01	NF Instance Id of the new SMF to which the SMF context is transferred.

6.2.6.2.6 Type: SmsfRegistration

Table 6.2.6.2.6-1: Definition of type SmsfRegistration

Attribute name	Data type	Р	Cardinality	Description
smsflnstanceld	NfInstanceId	М	1	NF Instance Id of the SMSF
smsfSetId	NfSetId	С	01	This IE shall be present if the SMSF belongs to an SMSF SET. If present, it indicates the NF Set ID of SMSF Set.
supportedFeatures	SupportedFeatures	0	01	See clause 6.2.8 These are the features supported by the SMSF.
plmnld	PlmnId	M	1	Serving node PLMN identity
smsfMAPAddress	E164Number	С	01	International E.164 number of the SMSF; shall be present if the SMSF supports MAP (see 3GPP TS 29.002 [21])
smsfDiameterAddress	NetworkNodeDiamet erAddress	С	01	shall be present if the SMSF supports Diameter (see 3GPP TS 29.338 [22])
registrationTime	DateTime	С	01	Time of SmsfRegistration. Shall be present when used on Nudr.
contextInfo	ContextInfo	С	01	This IE if present may contain e.g. the headers received by the UDM along with the SmsfRegistration. Shall be absent on Nudm and may be present on Nudr

# 6.2.6.2.7 Type: Amf3GppAccessRegistrationModification

This type is derived from the type Amf3GppAccessRegistration by deleting all attributes that are not subject to modification by means of the HTTP PATCH method.

Table 6.2.6.2.7-1: Definition of type Amf3GppAccessRegistrationModification

Guami	М	1	Guami of the AMF requesting the modification. If the MCC, MNC, AMF Region ID and AMF Set ID within the guami do not match the stored value, the
PurgeFlag	0		modification request shall be rejected.
		01	This flag indicates whether or not the AMF has deregistered. It shall be included in the Deregistration service operation with a value of "TRUE".
Pei	0	01	Permanent Equipment Identifier.
ImsVoPs	0	01	Indicates per UE if "IMS Voice over PS Sessions" is homogeneously supported in all TAs in the serving AMF, or homogeneously not supported, or if support is non-homogeneous/unknown
array(BackupAmf Info)	С	0N	This IE shall be included if the NF service consumer is an AMF and the AMF supports the AMF management without UDSF for the Modification of the BackupAmfInfo.  The UDM uses this attribute to do an NRF query in order to invoke later services in a backup AMF, e.g. Namf_EventExposure
EpsInterworkingI nfo	С	01	This IE shall be included if the AMF has determined per APN/DNN which PGW-C+SMF is selected for EPS interworking with N26 and the AMF supports EPS interworking of non-3GPP access. This IE shall also be included to update the PGW-C+SMF information if the AMF selects another PGW-C+SMF for EPS interworking with N26 for the same DNN. For each APN/DNN, only one PGW-C+SMF shall be selected by the AMF for EPS interworking.
boolean	0	01	This IE indicates whether the UE supports 5G SRVCC: - true: 5G SRVCC is supported by the UE and AMF; - false: 5G SRVCC is not supported.
	ImsVoPs  array(BackupAmf Info)  EpsInterworkingInfo	ImsVoPs O  array(BackupAmf Info)  EpsInterworkingI C nfo  boolean O	ImsVoPs O 01  array(BackupAmf C 0N Info)  EpsInterworkingI C 01

true" in the OpenAPI file as deletion of these attributes is not applicable.

# 6.2.6.2.8 Type: AmfNon3GppAccessRegistrationModification

This type is derived from the type AmfNon3GppAccessRegistration by deleting all attributes that are not subject to modification by means of the HTTP PATCH method.

Table 6.2.6.2.8-1: Definition of type AmfNon3GppAccessRegistrationModification

Attribute name	Data type	Р	Cardinality	Description
guami	Guami	М	1	Guami of the AMF requesting the modification. If the MCC, MNC, AMF Region ID and AMF Set ID within the guami do not match the stored value, the modification request shall be rejected.
purgeFlag	PurgeFlag	0	01	This flag indicates whether or not the AMF has deregistered. It shall be included in the Deregistration service operation with a value of "TRUE".
pei	Pei	0	01	Permanent Equipment Identifier
imsVoPs	ImsVoPs	0	01	If present indicates per UE that support of "IMS Voice over PS Sessions" has been modified to supported or not supported".  The value NON_HOMOGENEOUS_OR_UNKNOWN is not applicable.
backupAmfInfo	array(BackupAmf Info)	С	0N	This IE shall be included if the NF service consumer is an AMF and the AMF supports the AMF management without UDSF for the Modification of the BackupAmfInfo.  The UDM uses this attribute to do an NRF query in order to invoke later services in a backup AMF, e.g. Namf_EventExposure
	optional attributes indic OpenAPI file as deletio			on. Attributes of this type are not marked "nullable:

6.2.6.2.9 Type: PcscfRestorationNotification

Table 6.2.6.2.9-1: Definition of type PcscfRestorationNotification

Attribute name	Data type	Р	Cardinality	Description
supi	Supi	M	1	A SUPI that is served by the failed P-CSCF

6.2.6.2.10 Type: NetworkNodeDiameterAddress

Table 6.2.6.2.10-1: Definition of type NetworkNodeDiameterAddress

Attribute name	Data type	Р	Cardinality	Description
name	DiameterIdentity	M	1	
realm	DiameterIdentity	М	1	

6.2.6.2.11 Type: EpslwkPgw

Table 6.2.6.2.11-1: Definition of type EpslwkPgw

Attribute name	Data type	Р	Cardinality	Description
pgwFqdn	string	М	1	The PGW FQDN of the "PGW-C+SMF"
smflnstanceld	NfInstanceId	М	1	The SMF Instance Id of the "PGW-C+SMF"

6.2.6.2.12 Type: TriggerRequest

Table 6.2.6.2.12-1: Definition of type TriggerRequest

Attribute name	Data type	Р	Cardinality	Description
supi	Supi	М	1	

6.2.6.2.13 Type: AmfDeregInfo

Table 6.2.6.2.13-1: Definition of type AmfDeregInfo

Attribute name	Data type	Р	Cardinality	Description
deregReason	Deregistration	М	1	String; see clause 6.2.6.3.3
	Reason			

6.2.6.2.14 Type: EpsInterworkingInfo

Table 6.2.6.2.14-1: Definition of type EpsInterworkingInfo

Attribute name	Data type	Р	Cardinality	Description
epslwkPgws	map(EpslwkPgw)	0	0N	A map (list of key-value pairs where dnn serves
-				as key) of EpslwkPgws.
				An empty map is used in
				Amf3GppAccessRegistrationModification to
				delete the epsInterworkingInfo.

6.2.6.2.15 Type: LocationInfo

Table 6.2.6.2.15-1: Definition of type LocationInfo

Attribute name	Data type	Р	Cardinality	Description
supi	Supi	0	01	Subscription Permanent Identifier (NOTE 1)
gpsi	Gpsi	0	01	Generic Public Subscription Identifier (NOTE 1)
registrationLocationInfo List	array(RegistrationLo cationInfo)	М	12	Serving AMF, optional VGMLC and access type related informations used by (H)GMLC to send Location Request (NOTE 2)
supportedFeatures	SupportedFeatures	0	01	supportedFeatures

NOTE 1: One of both shall be included to identify the target UE.

NOTE 2: At least, one of 3GPP and Non-3GPP access types shall be included to describe the location related information of the target UE for the access type.

6.2.6.2.16 Type: RegistrationLocationInfo

Table 6.2.6.2.16-1: Definition of type RegistrationLocationInfo

Attribute name	Data type	Р	Cardinality	Description
amfInstanceId	NfInstanceId	М	1	The identity the AMF uses to register in the NRF
plmnld	Plmnld	С	01	Serving node PLMN identity is included if the target UE is in roaming case for the serving AMF. (NOTE)
vgmlcAddress	VgmlcAddress	C	01	The address(es) of VGMLC. (NOTE)
accessTypeList	array(AccessType)	М	12	Access type(s) where the UE is registered
NOTE: The two IEs are only be included if the target UE is registered in VPLMN via the serving AMF.				

6.2.6.2.17 Type: VgmlcAddress

Table 6.2.6.2.17-1: Definition of type VgmlcAddress

Attribute name	Data type	Р	Cardinality	Description	
vgmlcAddressIpv4	Ipv4Addr	0	01	When present, indicates VGMLC IPv4 address.	
vgmlcAddresslpv6	lpv6Addr	0	01	When present, indicates VGMLC IPv6 address.	
vgmlcFqdn	Fqdn	0	0,,1	When present, indicates FQDN of the VGMLC	
IPv6 address.					
NOTE: At least, one of VGMLC addresses should be included.					

6.2.6.2.18 Type: PeiUpdateInfo

Table 6.2.6.2.18-1: Definition of type AmfDeregInfo

Attribute name	Data type	Р	Cardinality	Description
pei	Pei	М	1	

6.2.6.2.19 Type: RegistrationDataSets

Table 6.2.6.2.19-1: Definition of type RegistrationDataSets

Attribute name	Data type	Р	Cardinality	Description
amf3Gpp	Amf3GppAccessReg istration	0	1	AMF 3GPP Access Registration
amfNon3Gpp	AmfNon3GppAccess Registration	0	1	AMF Non 3GPP Access Registration
smfRegistration	SmfRegistrationInfo	0	01	SMF Registration Information
smsf3Gpp	SmsfRegistration	0	01	SMSF 3GPP Access Registration
smsfNon3Gpp	SmsfRegistration	0	01	SMSF Non 3GPP Access Registration

6.2.6.2.20 Type: IpSmGwRegistration

Table 6.2.6.2.20-1: Definition of type IpSmGwRegistration

Attribute name	Data type	Р	Cardinality	Description
ipSmGwMapAddress	E164Number	С	01	International E.164 number of the IP-SM-GW; it shall be present if the IP-SM-GW supports MAP (see 3GPP TS 29.002 [21])
ipSmGwDiameterAddre ss	NetworkNodeDiamet erAddress	С	01	Diameter Identity of the IP-SM-GW; it shall be present if the IP-SM-GW supports Diameter (see 3GPP TS 29.328 [52])
unrilndicator	boolean	0	01	UE-Not-Reachable-for-IP (UNRI) flag as defined in 3GPP TS 23.040 [53]. This IE indicates whether the address list of MWD contains one or more entries because an attempt to deliver a short message to a UE via an IP-SM-GW has failed with a cause of Absent Subscriber: - true: the MWD contains one or more list elements due to an SMS delivery failure - false, or absence of this attribute: the MWD does not contain any list element
NOTE 1: At least one of	the properties, ipSmGv	vMap	Address or ipSi	mGwDiameterAddress, shall be present.

NOTE 2: The unrilndicator attribute shall only be exposed over the Nudr SBI.

#### 6.2.6.3 Simple data types and enumerations

#### 6.2.6.3.1 Introduction

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

#### 6.2.6.3.2 Simple data types

The simple data types defined in table 6.2.6.3.2-1 shall be supported.

Table 6.2.6.3.2-1: Simple data types

Type Name	Type Definition	Description
PurgeFlag	boolean	This flag indicates whether or not the NF has deregistered.
E164Number		see ITU-T Recommendation E.164 [23] pattern: ^[0-9]{1,15}\$
DualRegistrationFla g	boolean	Dual Registration Flag

## 6.2.6.3.3 Enumeration: DeregistrationReason

The enumeration DeregistrationReason represents the reason for the Deregistration Notification. It shall comply with the provisions defined in table 6.2.6.3.3-1.

Table 6.2.6.3.3-1: Enumeration DeregistrationReason

Enumeration value	Description
"UE_INITIAL_REGISTRATION"	When sent by the HSS; indicates that the deregistration towards the UDM is due to an initial attach in EPS. When sent by the UDM; indicates that the deregistration in the old AMF is due to a new AMF serving the UE during an initial registration See 3GPP TS 23.502 [3] and 3GPP TS 23.632 [32].
"UE_REGISTRATION_AREA_CHANGE"	see 3GPP TS 23.502 [3]
"SUBSCRIPTION_WITHDRAWN"	see 3GPP TS 23.502 [3]
"5GS_TO_EPS_MOBILITY"	see 3GPP TS 23.502 [3] and 3GPP TS 23.632 [32].
"5GS_TO_EPS_MOBILITY_UE_INITIAL_REGISTRATION"	This value shall only be sent by the UDM. It indicates that the deregistration in AMF is due to an initial attach in EPS, See 3GPP TS 23.502 [3] and 3GPP TS 23.632 [32].
"REREGISTRATION_REQUIRED"	see 3GPP TS 23.502 [3]
"SMF_CONTEXT_TRANSFERRED"	see 3GPP TS 23.502 [3]

### 6.2.6.3.4 Enumeration: ImsVoPs

The enumeration ImsVoPs represents information indicating homogeneity of IMS Voice over PS Sessions support for the UE. It shall comply with the provisions defined in table 6.2.6.3.4-1.

Table 6.2.6.3.4-1: Enumeration ImsVoPs

Enumeration value	Description
"HOMOGENEOUS_SUPPORT"	"IMS Voice over PS Sessions" is homogeneously supported in
	all TAs in the serving AMF.
"HOMOGENEOUS_NON_SUPPORT"	"IMS Voice over PS Sessions" is homogeneously not
	supported in all TAs in the serving AMF.
"NON_HOMOGENEOUS_OR_UNKNOWN"	"IMS Voice over PS Sessions" is not homogeneously
	supported in all TAs in the serving AMF, or its support is
	unknown.

# 6.2.6.3.5 Enumeration: RegistrationReason

The enumeration RegistrationCause represents the reason for the NF Registration. It shall comply with the provisions defined in table 6.2.6.3.5-1.

Table 6.2.6.3.5-1: Enumeration RegistrationReason

Enumeration value	Description
"SMF_CONTEXT_TRANSFERRED"	SMF transferred

### 6.2.6.3.6 Enumeration: RegistrationDataSetName

Table 6.2.6.3.6-1: Enumeration RegistrationDataSetName

Enumeration value	Description
"AMF_3GPP"	AMF 3GPP Access Registration
"AMF_NON_3GPP"	AMF Non 3GPP Access Registration
"SMF_PDU_SESSIONS"	SMF PDU Session Registration
"SMSF_3GPP"	SMSF 3GPP Access Registration
"SMSF_NON_3GPP"	SMSF Non 3GPP Access Registration

Note:

The current naming conventions for Enumerations (uppercase with underscore), when their intended usage is for query parameters is not consistent with the naming conventions for URI components (lowercase with hyphen).

# 6.2.7 Error Handling

### 6.2.7.1 General

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

The Cause codes mapping performed by AMF between the following HTTP responses returned by the UDM services to the AMF and the 5GMM related values is specified in clause 4.4.2 of 3GPP TS 29.524 [44].

### 6.2.7.2 Protocol Errors

Protocol errors handling shall be supported as specified in clause 5.2.7 of 3GPP TS 29.500 [4].

## 6.2.7.3 Application Errors

The common application errors defined in the Table 5.2.7.2-1 in 3GPP TS 29.500 [4] may also be used for the Nudm\_UEContextManagement service. The following application errors listed in Table 6.2.7.3-1 are specific for the Nudm\_UEContextManagement service.

Table 6.2.7.3-1: Application errors

Application Error	HTTP status code	Description
NF_CONSUMER_REDIRECT_ONE_TXN	307	The request has been asked to be redirected to a
	Temporary	specified target for one transaction.
	Redirect	
CONTEXT_NOT_FOUND	308	The request has been asked to be redirected to a
	Permanent	specified target.
	Redirect	
UNKNOWN_5GS_SUBSCRIPTION		No 5GS subscription is associated with the user.
NO_PS_SUBSCRIPTION		No PS (5GS, EPS, GPRS) subscription is
		associated with the user.
ROAMING_NOT_ALLOWED		The subscriber is not allowed to roam within that PLMN
USER_NOT_FOUND		The user does not exist in the HPLMN
CONTEXT_NOT_FOUND		It is used when no corresponding context exists.
ACCESS_NOT_ALLOWED	403 Forbidden	Access type not allowed for the user.
RAT_NOT_ALLOWED		RAT is not allowed for the user
DNN_NOT_ALLOWED		DNN not authorized for the user
REAUTHENTICATION_REQUIRED	403 Forbidden	Due to operator policies the user needs to be re-
		authenticated, e.g. last valid authentication is
		considered obsolete
INVALID_GUAMI	403 Forbidden	The AMF is not allowed to modify the registration
		information stored in the UDM, as it is not the
		registered AMF.
SERVICE_NOT_PROVISIONED	403 Forbidden	The request is related to a service that is not
		provisioned for the user in the 5GS subscription
		data (e.g. SMS teleservice not provisioned).
SERVICE_NOT_ALLOWED	403 Forbidden	The request is related to a service that is not
		allowed for the user in the 5GS subscription data
		(e.g. SMS is barred).
TEMPORARY_REJECT_REGISTRATION	409 Conflict	The request cannot be proccesed due to an
	100 0 0	ongoing registration procedure.
TEMPORARY_REJECT_HANDOVER_ONGOING	409 Conflict	The request cannot be proceesed due to an
ONGOING		ongoing N2 handover procedure.
UNPROCESSABLE_REQUEST	422	The request cannot be proccesed due to semantic
	•	errors when trying to process a patch method
	Entity	

# 6.2.8 Feature Negotiation

The optional features in table 6.2.8-1 are defined for the Nudm\_UECM API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

Table 6.2.8-1: Supported Features

Feature number	Feature Name	Description
1	SharedData	When receiving a Nudm_UECM_Registration service operation request for a UE that shares subscription data with other UEs, and the request does not indicate support of this feature by the service consumer, the UDM may – based on operator policy – decide to reject the registration.
2	PatchReport	If some of the modifications included in the PATCH request are not successfully implemented, the UDM reports the result of PATCH request execution to the consumer. See clause 5.2.7.2 of 3GPP TS 29.500 [4].

# 6.2.9 Security

As indicated in 3GPP TS 33.501 [6] and 3GPP TS 29.500 [4], the access to the Nudm\_UECM API may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [18]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [19]) plays the role of the authorization server.

If OAuth2 is used, an NF Service Consumer, prior to consuming services offered by the Nudm\_UECM API, shall obtain a "token" from the authorization server, by invoking the Access Token Request service, as described in 3GPP TS 29.510 [19], clause 5.4.2.2.

NOTE: When multiple NRFs are deployed in a network, the NRF used as authorization server is the same NRF that the NF Service Consumer used for discovering the Nudm\_UECM service.

The Nudm\_UECM API defines a single scope "nudm-uecm" for OAuth2 authorization (as specified in 3GPP TS 33.501 [6]) for the entire API, and it does not define any additional scopes at resource or operation level.

# 6.3 Nudm UEAuthentication Service API

### 6.3.1 API URI

URIs of this API shall have the following root:

{apiRoot}/{apiName}/<apiVersion>/

The request URI used in HTTP request from the NF service consumer towards the NF service producer shall have the structure defined in clause 4.4.1 of 3GPP TS 29.501 [5], i.e.:

### {apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [5].
- The <apiName> shall be "nudm-ueau".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 6.3.3.

# 6.3.2 Usage of HTTP

### 6.3.2.1 General

HTTP/2, as defined in IETF RFC 7540 [13], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

HTTP/2 shall be transported as specified in clause 5.3 of 3GPP TS 29.500 [4].

HTTP messages and bodies for the Nudm\_UEAU service shall comply with the OpenAPI [14] specification contained in Annex A4.

### 6.3.2.2 HTTP standard headers

### 6.3.2.2.1 General

The usage of HTTP standard headers shall be supported as specified in clause 5.2.2 of 3GPP TS 29.500 [4].

### 6.3.2.2.2 Content type

The following content types shall be supported:

JSON, as defined in IETF RFC 8259 [15], signalled by the content type "application/json".

The Problem Details JSON Object (IETF RFC 7807 [16] signalled by the content type "application/problem+json"

### 6.3.2.3 HTTP custom headers

### 6.3.2.3.1 General

The usage of HTTP custom headers shall be supported as specified in clause 5.2.3 of 3GPP TS 29.500 [4].

## 6.3.3 Resources

### 6.3.3.1 Overview

Figure 6.3.3.1-1 describes the resources supported by the Nudm\_UEAU API.

# //{apiRoot}/nudm-ueau/v1

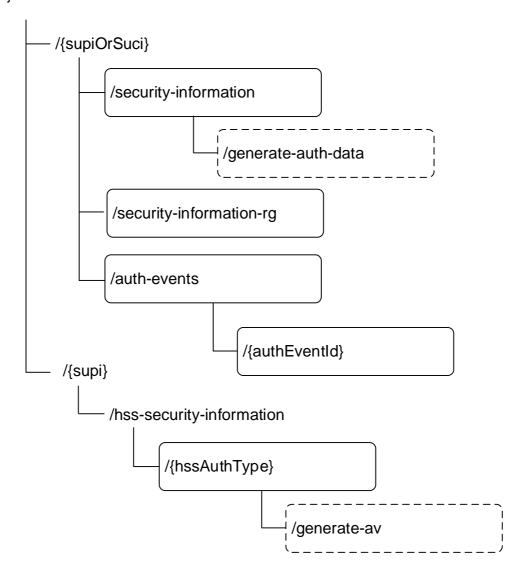


Figure 6.3.3.1-1: Resource URI structure of the nudm\_ueau API

Table 6.3.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.3.3.1-1: Resources and methods overview

Resource name (Archetype)	Resource URI	HTTP method or custom operation	Description
SecurityInformation (Custom operation)	/{supiOrSuci}/security- information/generate-auth-data	generate- auth-data (POST)	If the variable {supiOrSuci} takes the value of a SUCI, the UDM calculates the corresponding SUPI. The UDM calculates a fresh authentication vector based on the received information and the stored security information for the SUPI if 5G-AKA or EAP-AKA' is selected. Otherwise, UDM provides corresponding authentication information.
SecurityInformationForRg	/{supiOrSuci}/security-information-rg	GET	If the variable {supiOrSuci} takes the value of a SUCI, the UDM calculates the corresponding SUPI. The UDM decides, based on the received information and the stored authentication profile of the SUPI, that authentication by the home network is not required for the FN-RG.
AuthEvents (Collection)	/{supi}/auth-events	POST	Create an Authentication Event
Individual AuthEvent (Document)	/{supi}/auth-events/{authEventId}	PUT	Update an Authentication Event
HssSecurityInformation (Custom operation)	/{supi}/hss-security- information/{hssAuthType}/generate- av	generate- av (POST)	The UDM generates the authentication vector(s) of the requested type based on stored security information for the SUPI.

# 6.3.3.2 Resource: SecurityInformation (Custom operation)

# 6.3.3.2.1 Description

This resource represents the information that is needed together with the serving network name and the access type to calculate a fresh authentication vector. See 3GPP TS 33.501 [6].

### 6.3.3.2.2 Resource Definition

Resource URI: {apiRoot}/nudm-ueau/v1/{supiOrSuci}/security-information

This resource shall support the resource URI variables defined in table 6.3.3.2.2-1.

Table 6.3.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition							
apiRoot	string	See clause 6.3.1							
supiOrSuci	string	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2), Subscription Concealed Identifier (see 3GPP TS 23.003 [8]).							
		Pattern: See pattern of type SupiOrSuci in 3GPP TS 29.571 [7]							
		(See NOTE 1, NOTE 2).							
	1: The format for SUCI, when the corresponding SUPI is NAI-based, contains a realm that may include a								
to d	"minus" character ("-"), which is also used as field separator. Given that the NAI and its realm shall conform to IETF RFC 7542 [29], the regular expression defined here allows for non-ambiguous matching of the different fields of the SUCI, even when the realm contains the "minus" character.								
th s	When the SUCI, even when the realm contains the "minus" character.  When the SUCI corresponds to a SUPI of type IMSI, and the Null protection scheme is used, the MSIN of the IMSI (which is formatted by the UE and sent over the NAS protocol as Binary Coded Decimal, BCD) shall be formatted in the SUCI as an UTF-8 string containing all decimal digits of the MSIN; see Annex C for SUCI encoding examples.								

### 6.3.3.2.3 Resource Standard Methods

No Standard Methods are supported for this resource.

### 6.3.3.2.4 Resource Custom Operations

### 6.3.3.2.4.1 Overview

Table 6.3.3.2.4.1-1: Custom operations

Operation Name	Custom operation URI	Mapped HTTP method	Description
generate-auth-data	/generate-auth-data		Select the authentication method and calculate a fresh AV if 5G-AKA or EAP-AKA' is selected or provides corresponding authentication information.

### 6.3.3.2.4.2 Operation: generate-auth-data

### 6.3.3.2.4.2.1 Description

This custom operation is used by the NF service consumer (AUSF) to request authentication information data for the SUPI/SUCI from the UDM. If SUCI is provided, the UDM calculates the SUPI from the SUCI (see 3GPP TS 33.501 [6]). The UDM calculates an authentication vector taking into account the information received from the NF service consumer (AUSF) and the current representation of this resource if 5G AKA or EAP-AKA' is selected. For details see 3GPP TS 33.501 [6].

### 6.3.3.2.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.3.3.2.4.2.2-1 and the response data structure and response codes specified in table 6.3.3.2.4.2.2-2.

Table 6.3.3.2.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	Р	Cardinality	Description
AuthenticationInfo	М	1	Contains the serving network name and Resynchronization Information
Request			

Table 6.3.3.2.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
AuthenticationInf oResult	М	1	200 OK	Upon success, a response body containing the selected authentication method and an authentication vector if 5G AKA or EAP-AKA' has been selected shall be returned
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors: - AUTHENTICATION_REJECTED - INVALID_HN_PUBLIC_KEY_IDENTIFIER - INVALID_SCHEME_OUTPUT
ProblemDetails	0	01	501 Not Implemente d	The "cause" attribute may be used to indicate one of the following application errors: - UNSUPPORTED_PROTECTION_SCHEME  This response shall not be cached.
NOTE: In additi	on co	mmon data str	uctures as list	ed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

# 6.3.3.3 Resource: AuthEvents (Collection)

### 6.3.3.3.1 Description

This resource represents the collection of UE authentication events.

### 6.3.3.3.2 Resource Definition

Resource URI: {apiRoot}/nudm-ueau/v1/{supi}/auth-events

This resource shall support the resource URI variables defined in table 6.3.3.3.2-1.

Table 6.3.3.3.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.3.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: See pattern of type Supi in 3GPP TS 29.571 [7]

### 6.3.3.3.3 Resource Standard Methods

### 6.3.3.3.3.1 POST

This method shall support the URI query parameters specified in table 6.3.3.3.1-1.

Table 6.3.3.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.3.3.3.1-2 and the response data structures and response codes specified in table 6.3.3.3.1-3.

Table 6.3.3.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	Р	Cardinality	Description
AuthEvent	М	1	The UE Authentication Event

Table 6.3.3.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
AuthEvent	0	01	201 Created	Upon success, a response body containing a representation of the created Authentication Event may be returned.
				The HTTP response shall include a "Location" HTTP header that contains the resource URI of the created resource.
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND
NOTE: In addition	on coi	mmon data stru	ctures as listed	d in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

Table 6.3.3.3.1-4: Headers supported by the 201 Response Code on this resource

Name	Data type	Р	Cardinality	Description
Location	string	М		Contains the URI of the newly created resource, according to
				the structure: {apiRoot}/nudm-ueau/v1/{supi}/auth-
				events/{authEventId}

# 6.3.3.4 Resource: SecurityInformationForRg

### 6.3.3.4.1 Description

This resource represents the security information of FN-RG, see 3GPP TS 33.501 [6].

### 6.3.3.4.2 Resource Definition

Resource URI: {apiRoot}/nudm-ueau/v1/{supiOrSuci}/security-information-rg

This resource shall support the resource URI variables defined in table 6.3.3.4.2-1.

Table 6.3.3.4.2-1: Resource URI variables for this resource

Name	Data type	Definition						
apiRoot	string	See clause 6.3.1						
supiOrSuci	string	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2), or Subscription Concealed Identifier (see 3GPP TS 23.003 [8]).						
		Pattern: "^(suci-(0-[0-9]{3}-[0-9]{2,3} [1-7]+)-[0-9]{1,4}-(0-0+ [a-fA-F1-9]-([1-9] [1-9][0-9] 1[0-9]{2} 2[0-4][0-9] 25[0-5])-[a-fA-F0-9]+) .+)\$"						
		(See NOTE 1, NOTE 2).						
	1: The format for SUCI, when the corresponding SUPI is NAI-based, contains a realm that may include a "minus" character ("-"), which is also used as field separator. Given that the NAI and its realm shall conform							
		42 [29], the regular expression defined here allows for non-ambiguous matching of the						
		f the SUCI, even when the realm contains the "minus" character.						
	When the SUCI corresponds to a SUPI of type IMSI, and the Null protection scheme is used, the MSIN of							
t	ne IMSI (which	is formatted by the UE and sent over the NAS protocol as Binary Coded Decimal, BCD)						
S	hall be formatte	ed in the SUCI as an UTF-8 string containing all decimal digits of the MSIN; see Annex C for						
5	SUCI encoding	examples.						

### 6.3.3.4.3 Resource Standard Methods

### 6.3.3.4.3.1 GET

This method shall support the URI query parameters specified in table 6.3.3.4.3.1-1.

Table 6.3.3.4.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
authenticated-ind	AuthenticatedIn d	М	1	Indicates whether authenticated by the W-AGF or not:
supported- features	SupportedFeat ures	0	01	see 3GPP TS 29.500 [4] clause 6.6
plmn-id	Plmnld	0	01	PLMN identity of the PLMN serving the UE

If "plmn-id" is included, UDM shall return the authentication data of FN-RG in the PLMN identified by "plmn-id".

If "plmn-id" is not included, UDM shall return the authentication data of FN-RG for HPLMN.

This method shall support the request data structures specified in table 6.3.3.4.3.1-2 and the response data structures and response codes specified in table 6.3.3.4.3.1-3.

Table 6.3.3.4.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.3.3.4.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
RgAuthCtx	М	1	200 OK	Upon success, a response body containing the authentication indication.	
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate the following application error: - USER_NOT_FOUND	
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors: - AUTHENTICATION_REJECTED - INVALID_SCHEME_OUTPUT	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

# 6.3.3.5 Resource: HssSecurityInformation (Custom operation)

### 6.3.3.5.1 Description

This resource represents the information that is needed together with the serving network id and requested authentication method to calculate authentication vector(s) for PS/EPS or IMS domain. See 3GPP TS 23.632 [32].

### 6.3.3.5.2 Resource Definition

 $Resource\ URI:\ \{apiRoot\}/nudm-ueau/v1/\{supi\}/hss-security-information/\{hssAuthType\}$ 

This resource shall support the resource URI variables defined in table 6.3.3.5.2-1.

Table 6.3.3.5.2-1: Resource URI variables for this resource

Name	Data type	Definition	
apiRoot	string	See clause 6.3.1	
supi	Supi	Represents the mobile subscription identity (see 3GPP TS 23.003 [8]).	
		On this resource, only the IMSI format of SUPI is used.	
hssAuthType		Represents the type of AVs requested by the HSS.	
		It is defined as an enumeration of type "HssAuthTypeInUri".	

### 6.3.3.5.3 Resource Standard Methods

No Standard Methods are supported for this resource.

### 6.3.3.5.4 Resource Custom Operations

#### 6.3.3.5.4.1 Overview

Table 6.3.3.5.4.1-1: Custom operations

Operation Name	Custom operation URI	Mapped HTTP method	CaDescription
generate-av	/generate-av		Calculate the authentication vector(s) according to the requested information (authentication method, serving network id, resync info)

### 6.3.3.5.4.2 Operation: generate-av

### 6.3.3.5.4.2.1 Description

This custom operation is used by the NF service consumer (HSS) to request calculation of authentication vector(s) for the provided SUPI and the requested authentication method.

### 6.3.3.5.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.3.3.5.4.2.2-1 and the response data structure and response codes specified in table 6.3.3.5.4.2.2-2.

Table 6.3.3.5.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	Р	Cardinality	Description
HssAuthentication	М	1	Contains the authentication method, number of requested vectors, serving
InfoRequest			network id and resynchronization information

Table 6.3.3.5.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	Р	Cardinality	Response codes	Description	
HssAuthenticatio nInfoResult	М	1	200 OK	Upon success, a response body containing authentication vector(s) shall be returned.	
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate the following application error: - USER_NOT_FOUND	
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors: - AUTHENTICATION_REJECTED	
ProblemDetails	0	01	501 Not Implemente d	The "cause" attribute may be used to indicate the following application error: - UNSUPPORTED_AUTHENTICATION_METHOD  This response shall not be cached.	
NOTE: In addition, common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

# 6.3.3.6 Resource: Individual AuthEvent

### 6.3.3.6.1 Resource Definition

 $Resource\ URI:\ \{apiRoot\}/nudm-ueau/v1/\{supi\}/auth-events/\{authEventId\}$ 

This resource shall support the resource URI variables defined in table 6.3.3.6.1-1.

Table 6.3.3.6.1-1: Resource URI variables for this resource

Name	Data type	Definition			
apiRoot	string	See clause 6.3.1			
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2)			
		pattern: See pattern of type Supi in 3GPP TS 29.571 [7]			
authEventId	string	Represents the authEvent Id per UE per serving network assigned by the UDM during			
	-	ResultConfirmation service operation.			

### 6.3.3.6.2 Resource Standard Methods

6.3.3.6.2.1 PUT

This method shall support the URI query parameters specified in table 6.3.3.6.2.1-1.

Table 6.3.3.6.2.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.3.3.6.2.1-2 and the response data structures and response codes specified in table 6.3.3.6.2.1-3.

Table 6.3.3.6.2.1-2: Data structures supported by the PUT Request Body on this resource

Data type	Р	Cardinality	Description
AuthEvent	М	1	The UE Authentication Event

Table 6.3.3.6.2.1-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description	
n/a			204 No Content	Upon success, an empty response body shall be returned.	
ProblemDetails	0	01		If the resource corresponding to the authEventId does not exist, a response code of 404 Not Found shall be returned.	
				The "cause" attribute may be set to: - DATA_NOT_FOUND	
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

# 6.3.4 Custom Operations without associated resources

In this release of this specification, no custom operations without associated resources are defined for the Nudm\_UEAuthentication Service.

### 6.3.5 Notifications

In this release of this specification, no notifications are defined for the Nudm\_UEAuthentication Service.

### 6.3.6 Data Model

### 6.3.6.1 General

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

Table 6.3.6.1-1 specifies the data types defined for the Nudm\_UEAU service API.

Table 6.3.6.1-1: Nudm\_UEAU specific Data Types

Data type	Clause defined	Description
AuthenticationInfoRequest	6.3.6.2.2	Contains Serving Network Name and Resynchronization
		Information
AuthenticationInfoResult	6.3.6.2.3	Contains an Authentication Vector (AV)
AvEapAkaPrime	6.3.6.2.4	Contains RAND, XRES, AUTN, CK', and IK'
Av5GHeAka	6.3.6.2.5	Contains RAND, XRES*, AUTN, KAUSF
ResynchronizationInfo	6.3.6.2.6	Contains RAND and AUTS
AuthEvent	6.3.6.2.7	Authentication Event
AuthenticationVector	6.3.6.2.8	
RgAuthCtx	6.3.6.2.9	Contains the UE id (i.e. SUPI) and the authentication
		indication.
HssAuthenticationInfoRequest	6.3.6.2.10	Contains authentication method, serving network id, number
		of requested vectors and resynchronization information
HssAuthenticationInfoResult	6.3.6.2.11	Contains the authentication vectors for EPS/IMS domain
HssAuthenticationVectors	6.3.6.2.12	
AvEpsAka	6.3.6.2.13	Contains RAND, XRES, AUTN, KASME
AvlmsGbaEapAka	6.3.6.2.14	Contains RAND, XRES, AUTN, CK, and IK
Autn	6.3.6.3.2	
Auts	6.3.6.3.2	
CkPrime	6.3.6.3.2	
IkPrime	6.3.6.3.2	
Kausf	6.3.6.3.2	
Rand	6.3.6.3.2	
ServingNetworkName	6.3.6.3.2	
Success	6.3.6.3.2	
Xres	6.3.6.3.2	
XresStar	6.3.6.3.2	
AuthenticatedInd	6.3.6.3.2	
ConfidentialityKey	6.3.6.3.2	
IntegrityKey	6.3.6.3.2	
Kasme	6.3.6.3.2	
NumOfRequestedVectors	6.3.6.3.2	
Autn	6.3.6.3.2	
AuthType	6.3.6.3.3	
AvType	6.3.6.3.4	
HssAuthType	6.3.6.3.5	
HssAvType	6.3.6.3.6	
HssAuthTypeInUri	6.3.6.3.7	
AccessNetworkId	6.3.6.3.8	

Table 6.3.6.1-2 specifies data types re-used by the Nudm\_UEAU service API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nudm\_UEAU service API.

Table 6.3.6.1-2: Nudm\_UEAU re-used Data Types

Data type	Reference	Comments
ProblemDetails	3GPP TS 29.571 [7]	Common data type used in response bodies
NfInstanceId	3GPP TS 29.571 [7]	Network Function Instance Identifier
DateTime	3GPP TS 29.571 [7]	
SupportedFeatures	3GPP TS 29.571 [7]	see 3GPP TS 29.500 [4] clause 6.6
Supi	3GPP TS 29.571 [7]	
Cagld	3GPP TS 29.571 [7]	

#### 6.3.6.2 Structured data types

#### 6.3.6.2.1 Introduction

This clause defines the structures to be used in POST request / response bodies.

#### 6.3.6.2.2 Type: AuthenticationInfoRequest

Table 6.3.6.2.2-1: Definition of type AuthenticationInfoRequest

Data type	P	Cardinality	Description			
ServingNetworkName	М	1	See 3GPP TS 33.501 [6] clause 6.1.1.4			
ResynchronizationInfo	0	01	Contains RAND and AUTS; see			
			3GPP TS 33.501 [6] clause 7.5			
SupportedFeatures	0	01	See clause 6.3.8			
NfInstanceld	М	1	NF Instance Id of the AUSF			
array(Cagld)	0	1N	CAG List of the CAG cell.			
boolean			N5GC device Indicator indicates whether the user uses a N5GC device: See 3GPP TS 33.501 [6] true: N5GC device false (default): used device is 5G capable See NOTE			
NOTE: The attribute n5gcInd is used for EAP-TLS, which is described in the informative annex O of						
	ServingNetworkName ResynchronizationInfo SupportedFeatures NfInstanceId array(CagId) boolean	ServingNetworkName M ResynchronizationInfo O SupportedFeatures O NfInstanceId M array(CagId) O boolean O  GgcInd is used for EAP-TLS, which	ServingNetworkName M 1 ResynchronizationInfo O 01 SupportedFeatures O 01 NfInstanceId M 1 array(CagId) O 1N boolean O 01			

3GPP 15 33.501 [6] and is not mandatory to support.

#### 6.3.6.2.3 Type: AuthenticationInfoResult

Table 6.3.6.2.3-1: Definition of type AuthenticationInfoResult

Attribute name	Data type	Р	Cardinality	Description
authType	AuthType	М	1	Indicates the authentication method
authenticationVector	AuthenticationVector	С	01	contains an authentication vector if 5G AKA or EAP-AKA's is selected
supi	Supi	С	01	SUPI shall be present if the request contained the SUCI within the request URI
supportedFeatures	SupportedFeatures	0	01	See clause 6.3.8

#### 6.3.6.2.4 Type: AvEapAkaPrime

Table 6.3.6.2.4-1: Definition of type AvEapAkaPrime

Attribute name	Data type	Р	Cardinality	Description
avType	AvType	M	1	Type of authentication vector
rand	Rand	М	1	
xres	Xres	М	1	
autn	Autn	М	1	
ckPrime	CkPrime	М	1	
ikPrime	IkPrime	М	1	

6.3.6.2.5 Type: Av5GHeAka

Table 6.3.6.2.5-1: Definition of type Av5GAka

Attribute name	Data type	Р	Cardinality	Description
avType	AvType	M	1	Type of authentication vector
rand	Rand	М	1	
xresStar	XresStar	М	1	
autn	Autn	М	1	
kausf	Kausf	М	1	

6.3.6.2.6 Type: ResynchronizationInfo

Table 6.3.6.2.6-1: Definition of type ResynchronizationInfo

Attribute name	Data type	Р	Cardinality	Description
rand	Rand	М	1	
auts	Auts	М	1	

6.3.6.2.7 Type: AuthEvent

Table 6.3.6.2.7-1: Definition of type AuthEvent

Attribute name	Data type	Р	Cardinality	Description
nflnstanceld	NfInstanceId	М	1	Identifier of the NF instance where the authentication
				occurred (e.g. AUSF)
success	Success	M	1	true indicates success; false indicates no success.
				Set to false in case of authentication result removal.
timeStamp	DateTime	М	1	time stamp of the authentication
authType	AuthType	M	1	string
				Authentication Type
servingNetworkName	ServingNetworkN	M	1	See 3GPP TS 33.501 [6] clause 6.1.1.4
	ame			
authRemovalInd	Boolean	0	01	When present, it shall indicate the authentication
				result in the UDM shall be removed.
				This IE shall be set as follows:
				- true: authentication result in the UDM shall be
				removed;
				- false (default): authentication result in the UDM
				shall not be removed.

6.3.6.2.8 Type: AuthenticationVector

Table 6.3.6.2.8-1: Definition of type AuthenticationVector as a list of alternatives

Data type	Cardinality	Description
AvEapAkaPrime	1	
Av5GHeAka	1	

6.3.6.2.9 Type: RgAuthCtx

Table 6.3.6.2.9-1: Definition of type RgAuthCtx

Attribute name	Data type	Р	Cardinality	Description
authInd	boolean	M	01	When present, this IE shall be set as follows:         - true: authentication is not required;         - false (default): authentication is required.
supi	Supi	С	01	SUPI shall be present if the request contained the SUCI within the request URI
supportedFeatures	SupportedFeatures	0	01	See clause 6.3.8

6.3.6.2.10 Type: HssAuthenticationInfoRequest

Table 6.3.6.2.10-1: Definition of type HssAuthenticationInfoRequest

Attribute name	Data type	Р	Cardinality	Description			
hssAuthType	HssAuthType	М	1	Indicates the authentication method.			
numOfRequestedVectors	NumOfRequestedVectors	М	1	Maximum 5 vectors are allowed per service request.			
requestingNodeType	NodeType	С	01	Indicates the requesting node type. Should be included when known by the HSS.			
servingNetworkId	Plmnld	С	01	Shall be present if the authentication method is EPS_AKA.			
resynchronizationInfo	ResynchronizationInfo	0	01	Contains RAND and AUTS.			
anld	AccessNetworkId	0	01	Contains the Access Network ID used in the derivation of authentication vectors in EAP-AKA'.			
supportedFeatures   O   01   See clause 6.3.8							

6.3.6.2.11 Type: HssAuthenticationInfoResult

Table 6.3.6.2.11-1: Definition of type HssAuthenticationInfoResult

Attribute name	Data type	Р	Cardinality	Description
hssAuthenticationVectors	HssAuthenticationVectors	М	1	
supportedFeatures	SupportedFeatures	0	01	See clause 6.3.8

6.3.6.2.12 Type: HssAuthenticationVectors

Table 6.3.6.2.12-1: Definition of type HssAuthenticationVectors as a list of alternatives

Data type	Cardinality	Description
array(AvEpsAka)	15	
array(AvImsGbaEapAka)	15	This data type is also used for UMTS AKA.
array(AvEapAkaPrime)	15	

6.3.6.2.13 Type: AvEpsAka

Table 6.3.6.2.13-1: Definition of type AvEpsAka

Attribute name	Data type	Р	Cardinality	Description
avType	HssAvType	M	1	
rand	Rand	M	1	
xres	Xres	M	1	
autn	Autn	M	1	
kasme	Kasme	M	1	

# 6.3.6.2.14 Type: AvlmsGbaEapAka

Table 6.3.6.2.14-1: Definition of type AvlmsGbaEapAka

Attribute name	Data type	Р	Cardinality	Description
avType	HssAvType	М	1	
rand	Rand	М	1	
xres	Xres	M	1	
autn	Autn	M	1	
ck	ConfidentialityKey	М	1	
ik	IntegrityKey	М	1	

# 6.3.6.3 Simple data types and enumerations

### 6.3.6.3.1 Introduction

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

## 6.3.6.3.2 Simple data types

The simple data types defined in table 6.3.6.3.2-1 shall be supported.

Table 6.3.6.3.2-1: Simple data types

Type Name	Type Definition	Description
Autn	string	pattern: "^[A-Fa-f0-9]{32}\$"
Auts	string	pattern: "^[A-Fa-f0-9]{28}\$"
CkPrime	string	pattern: "^[A-Fa-f0-9]{32}\$"
IkPrime	string	pattern: "^[A-Fa-f0-9]{32}\$"
Kausf	string	pattern: "^[A-Fa-f0-9]{64}\$"
Rand	string	pattern: "^[A-Fa-f0-9]{32}\$"
ServingNetworkNa me	string	See 3GPP TS 33.501 [6] clause 6.1.1.4 pattern: "^5G:mnc[0-9]{3}[.]mcc[0-9]{3}[.]3gppnetwork[.]org(:[A-F0-9]{11}))?\$"
Success	boolean	true indicates success, false indicates no success
Xres	string	pattern: "^[A-Fa-f0-9]{8,32}\$"
XresStar	string	pattern: "^[A-Fa-f0-9]{32}\$"
AuthenticatedInd	boolean	Indicates whether authenticated by the W-AGF or not: - true: authenticated by the W-AGF; - false: unauthenticated by the W-AGF.
ConfidentialityKey	string	pattern: "^[A-Fa-f0-9]{32}\$"
IntegrityKey	string	pattern: "^[A-Fa-f0-9]{32}\$"
Kasme	string	pattern: "^[A-Fa-f0-9]{64}\$"
NumOfRequestedV	integer	minimum: 1_
ectors		maximum: 5

6.3.6.3.3 Enumeration: AuthType

Table 6.3.6.3.3-1: Enumeration AuthType

Enumeration value	Description	
"EAP_AKA_PRIME"	EAP-AKA'	
"5G_AKA"	5G AKA	
"EAP_TLS"	EAP-TLS. See NOTE	
NOTE: EAP-TLS is described in the Informative Annex B and Annex O of 3GPP TS 33.501 [6] and is not mandatory to support.		

6.3.6.3.4 Enumeration: AvType

Table 6.3.6.3.4-1: Enumeration AvType

Enumeration value	Description
"5G_HE_AKA"	
"EAP_AKA_PRIME"	

6.3.6.3.5 Enumeration: HssAuthType

Table 6.3.6.3.5-1: Enumeration HssAuthType

Enumeration value	Description
"EPS_AKA"	
"EAP_AKA"	
"EAP_AKA_PRIME"	EAP-AKA'
"IMS_AKA"	
"GBA_AKA"	
"UMTS_AKA"	

6.3.6.3.6 Enumeration: HssAvType

Table 6.3.6.3.6-1: Enumeration HssAvType

Enumeration value	Description
"EPS_AKA"	
"EAP_AKA"	
"IMS_AKA"	
"GBA_AKA"	
"UMTS_AKA"	

6.3.6.3.7 Enumeration: HssAuthTypeInUri

Table 6.3.6.3.7-1: Enumeration HssAuthTypeInUri

Enumeration value	Description
"eps-aka"	EPS-AKA authentication method
"eap-aka"	EAP-AKA authentication method
"eap-aka-prime"	EAP-AKA' authentication method
"ims-aka"	IMS-AKA authentication method
"gba-aka"	GBA-AKA authentication method

NOTE: This enumeration is used as a variable part of resource URIs, and therefore it follows the naming convention used in URIs (lower case with hyphens); see 3GPP TS 29.501 [5], clause 5.1.

### 6.3.6.3.8 Enumeration: AccessNetworkId

This data type contains the values for the Access Network Identities defined by 3GPP in the context of non-3GPP access to EPC, used in the generation of EAP-AKA' authentication vectors. The possible values are originally defined in 3GPP TS 24.302 [49].

Table 6.3.6.3.8-1: Enumeration AccessNetworkId

Enumeration value	Description
"HRPD"	Access Network: HRPD
"WIMAX"	Access Network: WiMAX
"WLAN"	Access Network: Wireless LAN
"ETHERNET"	Access Network: Ethernet

## 6.3.6.3.9 Enumeration: NodeType

Table 6.3.6.3.9-1: Enumeration NodeType

Enumeration value	Description
"AUSF"	This value is not applicable to the HSS.
"VLR"	
"SGSN"	
"S_CSCF"	
"BSF"	
"GAN_AAA_SERVER"	
"WLAN_AAA_SERVER"	
"MME"	

# 6.3.7 Error Handling

### 6.3.7.1 General

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

### 6.3.7.2 Protocol Errors

Protocol errors handling shall be supported as specified in clause 5.2.7 of 3GPP TS 29.500 [4].

## 6.3.7.3 Application Errors

The common application errors defined in the Table 5.2.7.2-1 in 3GPP TS 29.500 [4] may also be used for the Nudm\_UEAuthentication service. The following application errors listed in Table 6.3.7.3-1 are specific for the Nudm\_UEAuthentication service.

Table 6.3.7.3-1: Application errors

Application Error	HTTP	Description
	status code	
AUTHENTICATION_REJECTED	403	The user is cannot be
	Forbidden	authenticated with this
		authentication method e.g.
		only SIM data available
USER_NOT_FOUND	404 Not	The user does not exist in
	Found	the HPLMN
UNSUPPORTED_PROTECTION_SCHEME	501 Not	The received protection
	implemented	scheme is not supported by
		HPLMN
UNSUPPORTED_AUTHENTICATION_METHOD	501 Not	The requested authenti-
	implemented	cation method is not
		supported
INVALID_HN_PUBLIC_KEY_IDENTIFIER	403	Invalid HN public key
	Forbidden	identifier received
INVALID_SCHEME_OUTPUT	403	SUCI cannot be decrypted
	Forbidden	with received data
DATA_NOT_FOUND	404 Not	Resource corresponding to
	Found	the authEventId does not
		exist

# 6.3.8 Feature Negotiation

The optional features in table 6.3.8-1 are defined for the Nudm\_UEAU API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

Table 6.3.8-1: Supported Features

Feature number	Feature Name	Description

# 6.3.9 Security

As indicated in 3GPP TS 33.501 [6] and 3GPP TS 29.500 [4], the access to the Nudm\_UEAU API may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [18]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [19]) plays the role of the authorization server.

If OAuth2 is used, an NF Service Consumer, prior to consuming services offered by the Nudm\_UEAU API, shall obtain a "token" from the authorization server, by invoking the Access Token Request service, as described in 3GPP TS 29.510 [19], clause 5.4.2.2.

NOTE: When multiple NRFs are deployed in a network, the NRF used as authorization server is the same NRF that the NF Service Consumer used for discovering the Nudm\_UEAU service.

The Nudm\_UEAU API defines a single scope "nudm-ueau" for OAuth2 authorization (as specified in 3GPP TS 33.501 [6]) for the entire API, and it does not define any additional scopes at resource or operation level.

# 6.4 Nudm\_EventExposure Service API

### 6.4.1 API URI

URIs of this API shall have the following root:

{apiRoot}/<apiName>/<apiVersion>/

The request URI used in HTTP request from the NF service consumer towards the NF service producer shall have the structure defined in clause 4.4.1 of 3GPP TS 29.501 [5], i.e.:

### {apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [5].
- The <apiName> shall be "nudm-ee".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 6.4.3.

# 6.4.2 Usage of HTTP

### 6.4.2.1 General

HTTP/2, as defined in IETF RFC 7540 [13], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

HTTP/2 shall be transported as specified in clause 5.3 of 3GPP TS 29.500 [4].

HTTP messages and bodies for the Nudm\_EE service shall comply with the OpenAPI [14] specification contained in Annex A5.

### 6.4.2.2 HTTP standard headers

#### 6.4.2.2.1 General

The usage of HTTP standard headers shall be supported as specified in clause 5.2.2 of 3GPP TS 29.500 [4].

### 6.4.2.2.2 Content type

The following content types shall be supported:

JSON, as defined in IETF RFC 8259 [15], signalled by the content type "application/json".

The Problem Details JSON Object (IETF RFC 7807 [16] signalled by the content type "application/problem+json"

JSON Patch (IETF RFC 6902 [41]). The use of the JSON Patch format in a HTTP request body shall be signalled by the content type "application/json-patch+json".

### 6.4.2.3 HTTP custom headers

### 6.4.2.3.1 General

The usage of HTTP custom headers shall be supported as specified in clause 5.2.3 of 3GPP TS 29.500 [4].

# 6.4.3 Resources

### 6.4.3.1 Overview

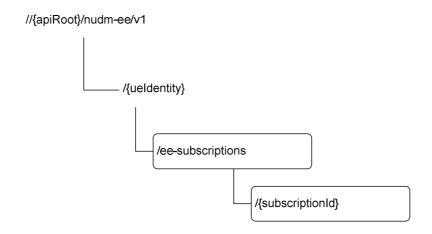


Figure 6.4.3.1-1: Resource URI structure of the Nudm\_EE API

Table 6.4.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.4.3.1-1: Resources and methods overview

Resource name (Archetype)	Resource URI	HTTP method or custom operation	Description
EeSubscriptions (Collection)	/{ueldentity}/ee-subscriptions	POST	Create a subscription
Individual subscription (Document)	/{ueldentity}/ee- subscriptions/{subscriptionId}	PATCH	Update the subscription identified by {subscriptionId}
		DELETE	Delete the subscription identified by {subscriptionId}, i.e. unsubscribe

# 6.4.3.2 Resource: EeSubscriptions (Collection)

## 6.4.3.2.1 Description

This resource is used to represent subscriptions to notifications.

### 6.4.3.2.2 Resource Definition

Resource URI: {apiRoot}/nudm-ee/v1/{ueIdentity}/ee-subscriptions

This resource shall support the resource URI variables defined in table 6.4.3.2.2-1.

Table 6.4.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.4.1
ueldentity	string	Represents a single UE or a group of UEs or any UE.  - If representing a single UE, this parameter shall contain the Generic Public Subscription Identifier (see 3GPP TS 23.501 [2] clause 5.9.8)  - pattern: "^(msisdn-[0-9]{5,15} extid-[^@]+@[^@]+ .+)\$"  - If representing a group of UEs, this parameter shall contain the External GroupId.  - pattern: "^extgroupid-[^@]+@[^@]+\$"  - If representing any UE, this parameter shall contain "anyUE".  - pattern: "^anyUE\$"

# 6.4.3.2.3 Resource Standard Methods

6.4.3.2.3.1 POST

This method shall support the URI query parameters specified in table 6.4.3.2.3.1-1.

Table 6.4.3.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.4.3.2.3.1-2 and the response data structures and response codes specified in table 6.4.3.2.3.1-3.

Table 6.4.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	Р	Cardinality	Description
EeSubscription	М	1	The subscription that is to be created

Table 6.4.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
CreatedEeSubscr iption	М	1	201 Created	Upon success, a response body containing a representation of the created Individual subscription resource shall be returned.  The HTTP response shall include a "Location" HTTP header that contains the resource URI of the created resource. When stateless UDM is deployed, the stateless UDM may use an FQDN identifying the UDM group to which the UDM belongs as the host part of the resource URI.
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors:  - MONITORING_NOT_ALLOWED  - AF_NOT_ALLOWED  - MTC_PROVIDER_NOT_ALLOWED
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND
ProblemDetails  NOTE: In addition	Ο	01	501 Not Implemente d	The "cause" attribute may be used to indicate one of the following application errors:  - UNSUPPORTED_MONITORING_EVENT_TYPE  - UNSUPPORTED_MONITORING_REPORT_OPTIONS  This response shall not be cached.  d in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

NOTE: In the scenario of stateless UDM deployment, it is assumed that stateless UDMs are organized into several UDM groups, and for each UDM group an FQDN can be allocated.

## 6.4.3.3 Resource: Individual subscription (Document)

### 6.4.3.3.1 Resource Definition

Resource URI: {apiRoot}/nudm-ee/v1/{ueIdentity}/ee-subscriptions/{subscriptionId}

This resource shall support the resource URI variables defined in table 6.4.3.3.1-1.

Table 6.4.3.3.1-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1
ueldentity	string	Represents a single UE or a group of UEs or any UE.  - If representing a single UE, this parameter shall contain the Generic Public Subscription Identifier (see 3GPP TS 23.501 [2] clause 5.9.8)  - pattern: "^(msisdn-[0-9]{5,15} extid-[^@]+@[^@]+ .+)\$"  - If representing a group of UEs, this parameter shall contain the External GroupId.  - pattern: "^extgroupid-[^@]+@[^@]+\$"  - If representing any UE, this parameter shall contain "anyUE".  - pattern: "^anyUE\$"
subscriptionId	string	The subscriptionId identifies an individual subscription to notifications.

### 6.4.3.3.2 Resource Standard Methods

## 6.4.3.3.2.1 DELETE

This method shall support the URI query parameters specified in table 6.4.3.3.2.1-1.

Table 6.4.3.3.1.1-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.4.3.3.2.1-2 and the response data structures and response codes specified in table 6.4.3.3.2.1-3.

Table 6.4.3.3.2.1-2: Data structures supported by the Delete Request Body on this resource

Data type	Р	Cardinality	Description
n/a			The request body shall be empty.

Table 6.4.3.3.2.1-3: 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.	
ProblemDetails	0	01		The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND - SUBSCRIPTION_NOT_FOUND, see 3GPP TS 29.500 [4] table 5.2.7.2-1.	
NOTE: In addition	NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.				

### 6.4.3.3.2.2 PATCH

This method shall support the URI query parameters specified in table 6.4.3.3.2.2-1.

Table 6.4.3.3.2.2-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	Р	Cardinality	Description
	SupportedFeat	0	01	see 3GPP TS 29.500 [4] clause 6.6
teatures	ures			

This method shall support the request data structures specified in table 6.4.3.3.2.2-2 and the response data structures and response codes specified in table 6.4.3.3.2.2-3.

Table 6.4.3.3.2.2-2: Data structures supported by the PATCH Request Body on this resource

Data type	Р	Cardinality	Description
array(PatchItem)	M	1N	Items describe the modifications to the Event Subscription

Table 6.4.3.3.2.2-3: Data structures supported by the PATCH Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
n/a			204 No Content	Upon success, an empty response body shall be returned. (NOTE 2)
PatchResult	М	1	200 OK	Upon success, the execution report is returned. (NOTE 2)
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND - SUBSCRIPTION_NOT_FOUND, see 3GPP TS 29.500 [4] table 5.2.7.2-1.
	0	01	403 Forbidden	One or more attributes are not allowed to be modified.  The "cause" attribute may be used to indicate one of the following application errors:  - MODIFICATION_NOT_ALLOWED, see 3GPP TS 29.500 [4] table 5.2.7.2-1.

NOTE 1: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

NOTE 2: If all the modification instructions in the PATCH request have been implemented, the UDM 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 UDM shall respond with PatchResult.

# 6.4.4 Custom Operations without associated resources

In this release of this specification, no custom operations without associated resources are defined for the Nudm\_EventExposure Service.

### 6.4.5 Notifications

### 6.4.5.1 General

This clause will specify the use of notifications and corresponding protocol details if required for the specific service. When notifications are supported by the API, it will include a reference to the general description of notifications support over the 5G SBIs specified in TS 29.500 / TS 29.501.

Table 6.4.5.1-1: Notifications overview

Notification	Resource URI	HTTP method or custom operation	Description (service operation)
Event		POST	
Occurrence	{callbackReference}		
Notification			

### 6.4.5.2 Event Occurrence Notification

The POST method shall be used for Event Occurrence Notifications and the URI shall be as provided during the subscription procedure.

Resource URI: {callbackReference}

Support of URI query parameters is specified in table 6.4.5.2-1.

Table 6.4.5.2-1: URI query parameters supported by the POST method

Name	Data type	Р	Cardinality	Description
n/a				

Support of request data structures is specified in table 6.4.5.2-2 and of response data structures and response codes is specified in table 6.4.5.2-3.

Table 6.4.5.2-2: Data structures supported by the POST Request Body

Data type	Р	Cardinality	Description
array(MonitoringR	М	1N	A list of MonitoringReports each of which contains information regarding the
eport)			occurred event

Table 6.4.5.2-3: Data structures supported by the POST Response Body

Data type	Р	Cardinality	Response codes	Description		
n/a			204 No	Upon success, an empty response body shall be returned.		
			Content			
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the		
			Found	following application errors:		
				- CONTEXT_NOT_FOUND		
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.						

# 6.4.6 Data Model

## 6.4.6.1 General

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

Table 6.4.6.1-1 specifies the data types defined for the Nudm\_EE service API.

Table 6.4.6.1-1: Nudm\_EE specific Data Types

Data type	Clause defined	Description
EeSubscription	6.4.6.2.2	A subscription to Notifications
MonitoringConfiguration	6.4.6.2.3	Monitoring Configuration
MonitoringReport	6.4.6.2.4	Monitoring Report
Report	6.4.6.2.5	
ReportingOptions	6.4.6.2.6	
ChangeOfSupiPeiAssociationReport	6.4.6.2.7	
RoamingStatusReport	6.4.6.2.8	
CreatedEeSubscription	6.4.6.2.9	
LocationReportingConfiguration	6.4.6.2.10	
CnTypeChangeReport	6.4.6.2.11	
ReachabilityForSmsReport	6.4.6.2.12	
DatalinkReportingConfiguration	6.4.6.2.13	Reporting configuration for events related to data link
CmInfoReport	6.4.6.2.14	Reporting UE's Connection Management State
		information per access type
LossConnectivityCfg	6.4.6.2.15	Configuration for loss of connectivity event
PduSessionStatusCfg	6.4.6.2.16	Reporting configuration for events related to PDU session Status
MaxNumOfReports	6.4.6.3.2	Maximum number of reports
ReferenceId	6.4.6.3.2	Reference Identity
EventType	6.4.6.3.3	Event type of UDM Event Exposure service
LocationAccuracy	6.4.6.3.4	Location Accuracy definition
CnType	6.4.6.3.5	Core Network Type
AssociationType	6.4.6.3.6	
EventReportMode	6.4.6.3.7	
ReachabilityForSmsConfiguration	6.4.6.3.8	

Table 6.4.6.1-2 specifies data types re-used by the Nudm\_EE service API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nudm\_EE service API.

Table 6.4.6.1-2: Nudm\_EE re-used Data Types

Data type	Reference	Comments
Uri	3GPP TS 29.571 [7]	Uniform Resource Identifier
SupportedFeatures	3GPP TS 29.571 [7]	see 3GPP TS 29.500 [4] clause 6.6
DateTime	3GPP TS 29.571 [7]	
Pei	3GPP TS 29.571 [7]	
Plmnld	3GPP TS 29.571 [7]	
Gpsi	3GPP TS 29.571 [7]	
AccessType	3GPP TS 29.571 [7]	
PatchResult	3GPP TS 29.571 [7]	
DddTrafficDescriptor	3GPP TS 29.571 [7]	
SamplingRatio	3GPP TS 29.571 [7]	
DurationSec	3GPP TS 29.571 [7]	
DIDataDeliveryStatus	3GPP TS 29.571 [7]	Downlink data delivery status
Dnn	3GPP TS 29.571 [7]	Data Network Name with Network Identifier only.
Snssai	3GPP TS 29.571 [7]	Single NSSAI
DiameterIdentity	3GPP TS 29.571 [7]	Diameter Identify
CmInfo	3GPP TS 29.518 [36]	Describe the Connection Management state information for
		an access type
MtcProviderInformation	3GPP TS 29.571 [7]	MTC Provider Information

# 6.4.6.2 Structured data types

### 6.4.6.2.1 Introduction

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

6.4.6.2.2 Type: EeSubscription

Table 6.4.6.2.2-1: Definition of type EeSubscription

Attribute name	Data type	Р	Cardinality	Description
callbackReference	Uri	М	1	URI provided by the NF service consumer to receive notifications
monitoringConfigurations	map(Monitoring Configuration)	М	1N	A map (list of key-value pairs where referenceld converted from integer to string serves as key; see clause 6.4.6.3.2) of MonitoringConfigurations; see clause 6.4.6.2.3
reportingOptions	ReportingOptio ns	0	01	This IE may be included if the NF service consumer wants to describe how the reports of the event to be generated.
supportedFeatures	SupportedFeat ures	0	01	See clause 6.4.8 These are the features supported by the NF subscribing at the UDM.
subscriptionId	string	С	01	This attribute shall be present if the EeSubscription is sent in a GET response message on Nudr. It identifies the individual EeSubscription stored in the UDR and may be used by the UDM to delete an EeSubscription.
contextInfo	ContextInfo	С	01	This IE if present may contain e.g. the headers received by the UDM along with the EeSubscription. Shall be absent on Nudm and may be present on Nudr.
epcAppliedInd	boolean	0	01	This IE indicates whether the subscription applies also to EPC or not.  true: the subscription applies also to EPC. false or absent: the subscription doesn't apply to EPC.
scefDiamHost	DiameterIdentit y	С	01	This IE shall be included if parameter epcAppliedInd is set to true and at least one of the notification to subscription applied to EPC will be reported directly from the MME to the SCEF (e.g. event LOCATION_REPORTING).  When present, it contains the Diameter Identify (FQDN) of the SCEF to which the monitered reports
scefDiamRealm	DiameterIdentit y	С	01	may be sent in EPC.  This IE shall be included if parameter epcAppliedInd is set to true and at least one of the notification to subscription applied to EPC will be reported directly from the MME to the SCEF (e.g. event LOCATION_REPORTING).  When present, It contains the Diameter realm of the
notifyCorrelationId	string	С	01	SCEF to which the monitered reports may be sent in EPC.  This attribute identifies the notification correlation ID shall be present by NF consumer in subscription.  The value of this IE shall be unique per subscription for a given NF service consumer.

6.4.6.2.3 Type: MonitoringConfiguration

Table 6.4.6.2.3-1: Definition of type MonitoringConfiguration

Attribute name	Data type	Р	Cardinality	Description
eventType	EventType	М	1	String; see clause 6.4.6.3.3
immediateFlag	boolean	0	01	Indicates if an immediate event report in the subscription response indicating current value / status of the event is required or not. If the flag is not present, then immediate reporting shall not be done.  If the event requested for immediate reporting is detected by the UDM, the UDM may include the current status of the event if available in the service operation response.  If the event requested for immediate reporting is detected by a remote NF (e.g. AMF) and directly notified to the NF consumer, the current status of the event shall not be included in the service operation response (the remote NF shall notify the current status of the event via event notification directly).
locationReportingConfig uration	LocationReportin gConfiguration	С	01	shall be present if eventType is "LOCATION_REPORTING"
associationType	AssociationType	Ο	01	If the eventType indicates CHANGE_OF_SUPI_PEI_ASSOCIATION, this parameter may be included to identify whether the IMSI-IMEI or IMSI-IMEISV association shall be detected. If the flag is not present, then a value of IMEISV shall be used
datalinkReportCfg	DatalinkReportin gConfiguration	С	01	shall be present if eventType is "DL_DATA_DELIVERY_STATUS" "AVAILABILITY_AFTER_DDN_FAILURE".
lossConnectivityCfg	LossConnectivity Cfg	0	01	May be present if eventType is  "LOSS_OF_CONNECTIVITY". (NOTE 1)
maximumLatency	DurationSec	0	01	May be present if eventType is "UE_REACHABILITY_FOR_DATA" When present, it indicates the configured Maximum Latency. (NOTE 1)
maximumResponseTim e	DurationSec	0	01	May be present if eventType is "UE_REACHABILITY_FOR_DATA" When present, it indicates the configured Maximum Response Time. (NOTE 1)
suggestedPacketNumDl	integer	0	01	May be present if eventType is "UE_REACHABILITY_FOR_DATA" When present, it indicates the configured Suggested number of downlink packets. (NOTE 1)
pduSessionStatusCfg	PduSessionStatu sCfg	0	01	may be present if eventType is  "PDN_CONNECTIVITY_STATUS"
reachabilityForSmsCfg	ReachabilityForS msConfiguration	0	01	REACHABILITY_FOR_SMS_OVER_NAS (default) or REACHABILITY_FOR_SMS_OVER_IP
mtcProviderInformation	MtcProviderInfor mation	0	01	Indicates MTC provider information for Monitoring Configuration authorization. (NOTE 2)
afld	string	0	01	The string identifying the originating AF, which is carried in {scsAsId} URI variable in resource URIs on T8/N33 interface (see clause 5 of 3GPP TS 29.122 [45]) or in {afId} URI variable in resource URIs on N33 interface (see clause 5 of 3GPP TS 29.522 [54]).  (NOTE 2)

NOTE 1: Parameters maximumLatency, maximumResponseTime, suggestedPacketNumDl and lossConnectivityCfg are not recommendated to be used for the AFs that support to set them by Parameter Provision service operation via NEF.

NOTE 2: Only applicable when eventType is "UE\_REACHABILITY\_FOR\_DATA" or "LOSS\_OF\_CONNECTIVITY".

# 6.4.6.2.4 Type: MonitoringReport

Table 6.4.6.2.4-1: Definition of type MonitoringReport

Attribute name	Data type	Р	Cardinality	Description
referenceId	ReferenceId	M	1	Shall contain the Reference ID which was provided as the key of the associated monitoring configuration in subscription request. The consumer can use this IE to uniquely associate the report with the corresponding event that was requested to be monitored.
eventType	EventType	M	1	String; see clause 6.4.6.3.3 only the following values are allowed: "UE_REACHABILITY_FOR_SMS" "CHANGE_OF_SUPI_PEI_ASSOCIATION" "ROAMING_STATUS" "CN_TYPE_CHANGE" "UE_CONNECTION_MANAGEMENT_STATE"
report	Report	С	01	Shall be present if eventType is  "CHANGE_OF_SUPI_PEI_ASSOCIATION" or  "ROAMING_STATUS"  "CN_TYPE_CHANGE"  "UE_CONNECTION_MANAGEMENT_STATE"
reachabilityForSmsRep ort	ReachabilityForS msReport	С	01	Should be present if eventType is "UE_REACHABILITY_FOR_SMS" and reachabilityForSmsCfg was absent from the MonitoringConfiguration or indicated REACHABILITY_FOR_SMS_OVER_NAS
gpsi	Gpsi	С	01	shall be present if the report is associated to exposure subscriptions for a group of UEs or any UE.
timeStamp	DateTime	М	1	Point in time at which the event occurred

6.4.6.2.5 Type: Report

Table 6.4.6.2.5-1: Definition of type Report as a list of mutually exclusive alternatives

Data type	Cardinality	Description
ChangeOfSupiPeiAssociat	1	
ionReport		
RoamingStatusReport	1	
CnTypeChangeReport	1	Report new CN type after switching
CmInfoReport	1	Report the UE's CM state

6.4.6.2.6 Type: ReportingOptions

Table 6.4.6.2.6-1: Definition of type ReportingOptions

Attribute name	Data type	Р	Cardinalit y	Description
reportMode	EventReportMode	0	01	Indicates the mode of report (e.g, periodic reporting along with periodicity, reporting based on event detection). See clause 4.15.1 of 3GPP TS23.502 [3].
maxNumOfReports	MaxNumOfReports	С	01	Maximum number of reports. If the event subscription is for a group of UEs, this parameter shall be applied to each individual member UE of the group.  (NOTE 2)
expiry	DateTime	С	01	This IE shall be included in an event subscription response, if, based on operator policy, the UDM needs to include an expiry time, and may be included in an event subscription request. When present, this IE shall represent the time at which monitoring shall cease and the subscription becomes invalid. If the maxNumOfReports included in an event subscription response is 1 and if an event report is included in the subscription response then the value of the expiry included in the response shall be an immediate timestamp.
samplingRatio	SamplingRatio	0	01	Indicates the percentage of sampling among impacted UEs, this parameter is used for group-based monitoring configuration. See clause 4.15.1 of 3GPP TS23.502 [3]. (NOTE 1)
guardTime	DurationSec	0	01	Indicates the time for which the Monitoring Event Reporting(s) detected by the UEs in a group can be aggregated before sending them to the consumer NF, this parameter is used for group-based monitoring configuration. See clause 4.15.1 of 3GPP TS23.502 [3].
reportPeriod	DurationSec		01	Indicates the interval time between which the event notification is reported, shall be present if reportMode is "PERIODIC".

NOTE 1: Parameter only applicable to certain event IDs reporting metrics (e.g. Number of UEs present in a geographical area) used and used e.g. by the NWDAF for data collection.

NOTE 2 If parameter "maxNumOfReports" and "expiry" are included at the same time, the subscription will expire as soon as one of the conditions is met. If the ReportMode is set to "PERIODIC", at least one of the "maxNumOfReports" and "expiry" attributes shall be included.

# 6.4.6.2.7 Type: ChangeOfSupiPeiAssociationReport

### Table 6.4.6.2.7-1: Definition of type ChangeOfSupiPeiAssociationReport

Attribute name	Data type	Р	Cardinality	Description
newPei	Pei	М	1	the new PEI

## 6.4.6.2.8 Type: RoamingStatusReport

Table 6.4.6.2.8-1: Definition of type RoamingStatusReport

Attribute name	Data type	Р	Cardinality	Description
roaming	boolean	M	1	True: The new serving PLMN is different from the HPLMN; False: The new serving PLMN is the HPLMN
newServingPlmn	Plmnld	М		the new Serving PLMN

6.4.6.2.9 Type: CreatedEeSubscription

Table 6.4.6.2.9-1: Definition of type CreatedEeSubscription

Attribute name	Data type	Р	Cardinality	Description
eeSubscription	EeSubscription	М	1	This IE shall contain the representation of the created event subscription.
numberOfUes	Uinteger	С	01	This IE shall be included if the event subscription is for a group of UEs. When present, this IE shall represent the number of UEs in the group.
eventReports	array(Monitoring Report)	0	1N	This IE when present, shall contain the status of events that are requested for immediate reporting as well, if those events are available at the time of subscription.  If an event requested for immediate reporting is detected by another NF (e.g. AMF) and directly notified to the NF consumer, the status of the event shall not be included in this IE.
epcStatusInd	boolean	С	01	This IE indicates whether the subscription was also successful in EPC domain or not.  true: the subscription was also successful in EPC domain. false: the subscription was not successful in EPC domain.  This IE shall be included if epcAppliedInd is true in the subscription request.

# 6.4.6.2.10 Type: LocationReportingConfiguration

Table 6.4.6.2.10-1: Definition of type LocationReportingConfiguration

Attribute name	Data type	Р	Cardinality	Description
currentLocation	boolean	M	1	When true: Indicates that current location is requested. When false: Indicates that last known location is requested.
oneTime	boolean	C	01	When true: Indicates that a single report is requested. When false or absent: Indicates that continuous reporting is requested. Shall not be absent or set to false when currentLocation is false.
accuracy	LocationAccuracy	С	01	Indicates whether Cell-level or TA-level accuracy is requested for 3GPP access. (NOTE 1)
n3gppAccuracy	LocationAccuracy	С	01	Indicates whether N3IWF or UE IP or UE PORT level accuracy is requested for non-3GPP access. (NOTE 1)
NOTE 1: At least one of	of accuracy and n3gpp	Acc	uracy shall be	present if continuous reporting is required

# 6.4.6.2.11 Type: CnTypeChangeReport

Table 6.4.6.2.11-1: Definition of type CnTypeChangeReport

Attribute name	Data type	Р	Cardinality	Description
oldCnType	CnType	0	01	the old CN type
newCnType	CnType	М	1	the new CN type

6.4.6.2.12 Type: ReachabilityForSmsReport

Table 6.4.6.2.12-1: Definition of type ReachabilityForSmsReport

Attribute name	Data type	Р	Cardinality	Description
smsfAccessType	AccessType	Μ	1	
maxAvailabilityTime	DateTime	0	01	Indicates the time (in UTC) until which the UE is expected to be reachable.  This information may be used by the SMS Service Center to prioritize the retransmission of pending Mobile Terminated Short Message to UEs using a power saving mechanism (eDRX, PSM etc.).

6.4.6.2.13 Type: DatalinkReportingConfiguration

Table 6.4.6.2.13-1: Definition of type DatalinkReportingConfiguration

Attribute name	Data type	Р	Cardinality	Description
dddTrafficDes	array(DddTraffic Descriptor)	С	1N	This IE shall be present for event type "DL_DATA_DELIVERY_STATUS" "AVAILABILITY_AFTER_DDN_FAILURE".
				When present, this IE shall indicate the traffic descriptors of the downlink data.
dnn	Dnn	0	01	When present, this IE shall contain the Network Identifier only and indicate the DNN of the PDU session serving the data link.
slice	Snssai	0	01	When present, this IE shall indicate the slice information of the PDU session serving the data link.
dddStatusList	array(DIDataDeliv eryStatus)	0	1N	This IE shall be present for event type "DL_DATA_DELIVERY_STATUS".
				When present, this IE shall indicate the subscribed statuses (discarded, transmitted, buffered) for the event. If omitted all stati are subscribed.

6.4.6.2.14 Type: CmInfoReport

Table 6.4.6.2.11-1: Definition of type CmInfoReport

Attribute name	Data type	Р	Cardinality	Description
oldCmInfoList	array(CmInfo)	0	12	the old CM State information
newCmInfoList	array(CmInfo)	М	12	the new CM State information

6.4.6.2.15 Type: LossConnectivityCfg

Table 6.4.6.2.15-1: Definition of type LossConnectivityCfg

Attribute name	Data type	Р	Cardinality	Description
maxDetectionTime	DurationSec	0	01	When present, it indicates the configured Maximum
				Detection Time

# 6.4.6.2.16 Type: PduSessionStatusCfg

Table 6.4.6.2.16-1: Definition of type PduSessionStatusCfg

Attribute name	Data type	Р	Cardinality	Description
dnn	Dnn	0	01	When present, it indicates the DNN for which the
				event is monitored.

# 6.4.6.3 Simple data types and enumerations

### 6.4.6.3.1 Introduction

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

# 6.4.6.3.2 Simple data types

The simple data types defined in table 6.4.6.3.2-1 shall be supported.

Table 6.4.6.3.2-1: Simple data types

Type Name	Type Definition	Description
MaxNumOfReports	integer	Maximum number of reports. Minimum: 1
ReferenceId	integer	Referenceld is used as key in a map of MonitoringConfigurations; see clause 6.4.6.2.2.  The numeric value should not be higher than 2^64-1 (i.e. it should be possible to convey it in an unsigned 64 integer Information Element, used in other protocols), if interworking with the Event Exposure framework in EPC is required.

# 6.4.6.3.3 Enumeration: EventType

Table 6.4.6.3.3-1: Enumeration EventType

Enumeration value	Description
"LOSS_OF_CONNECTIVITY"	Loss of connectivity
"UE_REACHABILITY_FOR_DATA"	UE reachability for data, implements the "UE Reachability" monitoring event as specified in clause 4.15.3.1 in 3GPP TS 23.502 [3].
	When this event is subscribed by an NF service consumer, the UDM subscribes to "ReachabilityReport" event for "UE Reachability for DL Traffic" on the AMF without URRP-AMF.
	When this event is subscribed by an NF service consumer, the UDM shall request the AMF to directly send notification to NF.
"UE_REACHABILITY_FOR_SMS"	UE reachability for SMS, implements the "UE Reachability for SMS Delivery" event as specified in clause 4.15.3.1 of 3GPP TS 23.502 [3].
	This Event is reported when an SMSF is being registered in UDM for the UE, or when a UE Activity notification is received from AMF and there is an SMSF already registered for the UE.
	This event only supports One-Time reporting.
"LOCATION_REPORTING"	Location Reporting
"CHANGE_OF_SUPI_PEI_ASSOCIATION	Change of SUPI-PEI association
"ROAMING_STATUS"	Roaming Status
"COMMUNICATION_FAILURE"	Communication Failure
"AVAILABILITY_AFTER_DDN_FAILURE"	Availability after DDN failure
"CN_TYPE_CHANGE"	CN type change
"DL_DATA_DELIVERY_STATUS"	Downlink Data Delivery Status
"PDN_CONNECTIVITY_STATUS"	PDU Session Status
"UE_CONNECTION_MANAGEMENT_STA TE"	UE state of Connection Management

# 6.4.6.3.4 Enumeration: LocationAccuracy

Table 6.4.6.3.4-1: Enumeration LocationAccuracy

Enumeration value	Description
"CELL_LEVEL"	change of cell shall be reported for 3GPP access
"TA_LEVEL"	change of TA shall be reported for 3GPP access
"N3IWF_LEVEL"	Change of N3IWF node shall be reported for non-3GPP
	access
"UE_IP"	change of UE IP address (used to reach the N3IWF) shall be reported for non-3GPP access
"UE_PORT"	Change of UE source port shall be reported for non-3GPP
	access

# 6.4.6.3.5 Enumeration: CnType

Table 6.4.6.3.5-1: Enumeration CnType

Enumeration value	Description
"SINGLE_4G"	Single registration in 4G
"SINGLE_5G"	Single registration in 5G
"DUAL_4G5G"	Dual registration in 4G and 5G

### 6.4.6.3.6 Enumeration: AssociationType

Table 6.4.6.3.6-1: Enumeration AssociationType

Enumeration value	Description
"IMEI_CHANGE"	The event shall be reported if the association between IMSI
	and IMEI has changed; if only the Software Version (SV) has
	changed, no event shall be reported.
"IMEISV_CHANGE"	The event shall be reported if the association between IMSI
	and IMEI, or SV, or both, has changed (this includes the case
	where only the SV has changed).

### 6.4.6.3.7 Enumeration: EventReportMode

Table 6.4.6.3.7-1: Enumeration EventReportMode

Enumeration value	Description
"PERIODIC"	The notification is periodically sent.
"ON_EVENT_DETECTION"	The notification is sent based on event detection.

# 6.4.6.3.8 Enumeration: ReachabilityForSmsConfiguration

Table 6.4.6.3.8-1: Enumeration ReachabilityForSmsConfiguration

Enumeration value	Description
"REACHABILITY_FOR_SMS_OVER_NAS"	Indicates that the Monitoring Configuration with Event Type UE_REACHABILITY_FOR_SMS requests a notification when the UE is reachable for SMS via a registered SMSF (default)
"REACHABILITY_FOR_SMS_OVER_IP"	Indicates that the Monitoring Configuration with Event Type UE_REACHABILITY_FOR_SMS requests a notification when the UE is reachable for SMS over IP, i.e. regardless of an SMSF being registered.

# 6.4.7 Error Handling

### 6.4.7.1 General

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

# 6.4.7.2 Protocol Errors

Protocol errors handling shall be supported as specified in clause 5.2.7 of 3GPP TS 29.500 [4].

## 6.4.7.3 Application Errors

The common application errors defined in the Table 5.2.7.2-1 in 3GPP TS 29.500 [4] may also be used for the Nudm\_EventExposure service. The following application errors listed in Table 6.4.7.3-1 are specific for the Nudm EventExposure service.

Table 6.4.7.3-1: Application errors

Application Error	HTTP status code	Description
MONITORING_NOT_ALLOWED	403 Forbidden	The subscriber does not have the necessary subscription for monitoring
AF_NOT_ALLOWED	403 Forbidden	with the requested Event Type.  This AF is not allowed to perform monitoring configuration.
MTC_PROVIDER_NOT_ALLOWED	403 Forbidden	MTC Provider not authorized to perform monitoring configuration.
USER_NOT_FOUND	404 Not Found	The user does not exist
CONTEXT_NOT_FOUND	404 Not Found	It is used when no corresponding context exists.
UNSUPPORTED_MONITORING_EVENT_TYPE	501 Not Implemented	The monitoring configuration contains unsupported event type.
UNSUPPORTED_MONITORING_REPORT_OPTIONS	501 Not Implemented	The monitoring configuration contains unsupported report options.

# 6.4.8 Feature Negotiation

The optional features in table 6.4.8-1 are defined for the Nudm\_EE API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

**Table 6.4.8-1: Supported Features** 

Feature number	Feature Name	Description
1	1	If some of the modifications included in the PATCH request are not successfully implemented, the UDM reports the result of PATCH request execution to the consumer. See clause 5.2.7.2 of 3GPP TS 29.500 [4].

# 6.4.9 Security

As indicated in 3GPP TS 33.501 [6] and 3GPP TS 29.500 [4], the access to the Nudm\_EE API may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [18]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [19]) plays the role of the authorization server.

If OAuth2 is used, an NF Service Consumer, prior to consuming services offered by the Nudm\_EE API, shall obtain a "token" from the authorization server, by invoking the Access Token Request service, as described in 3GPP TS 29.510 [19], clause 5.4.2.2.

NOTE: When multiple NRFs are deployed in a network, the NRF used as authorization server is the same NRF that the NF Service Consumer used for discovering the Nudm\_EE service.

The Nudm\_EE API defines a single scope "nudm-ee" for OAuth2 authorization (as specified in 3GPP TS 33.501 [6]) for the entire API, and it does not define any additional scopes at resource or operation level.

# 6.5 Nudm ParameterProvision Service API

### 6.5.1 API URI

URIs of this API shall have the following root:

{apiRoot}/{apiName}/<apiVersion>/

The request URI used in HTTP request from the NF service consumer towards the NF service producer shall have the structure defined in clause 4.4.1 of 3GPP TS 29.501 [5], i.e.:

# 

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [5].
- The <apiName> shall be "nudm-pp".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 6.5.3.

# 6.5.2 Usage of HTTP

#### 6.5.2.1 General

HTTP/2, as defined in IETF RFC 7540 [13], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

HTTP/2 shall be transported as specified in clause 5.3 of 3GPP TS 29.500 [4].

HTTP messages and bodies for the Nudm\_PP service shall comply with the OpenAPI [14] specification contained in Annex A6.

### 6.5.2.2 HTTP standard headers

### 6.5.2.2.1 General

The usage of HTTP standard headers shall be supported as specified in clause 5.2.2 of 3GPP TS 29.500 [4].

## 6.5.2.2.2 Content type

The following content types shall be supported:

JSON, as defined in IETF RFC 8259 [15], signalled by the content type "application/json".

The Problem Details JSON Object (IETF RFC 7807 [16] signalled by the content type "application/problem+json"

JSON Merge Patch, as defined in IETF RFC 7396 [17], signalled by the content type "application/merge-patch+json"

### 6.5.2.3 HTTP custom headers

### 6.5.2.3.1 General

The usage of HTTP custom headers shall be supported as specified in clause 5.2.3 of 3GPP TS 29.500 [4].

# 6.5.3 Resources

## 6.5.3.1 Overview

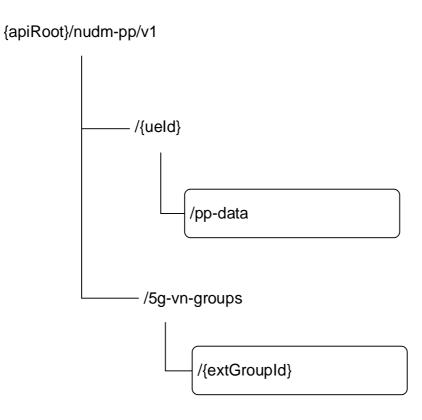


Figure 6.5.3.1-1: Resource URI structure of the Nudm\_PP API

Table 6.5.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.5.3.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
PpData	/{ueld}/pp-data	PATCH	Modify the UE's modifiable
			subscription data
			Send updated SoR Information for a
			UE to the UDM
5GVnGroupConfiguration	/5g-vn-groups/{extGroupId}	PUT	Create a 5G VN Group
		DELETE	Delete a 5G VN Group
		PATCH	Modify a 5G VN Group

6.5.3.2 Resource: PpData

## 6.5.3.2.1 Description

This resource is used to represent Parameter Provisioning Data.

### 6.5.3.2.2 Resource Definition

Resource URI: {apiRoot}/nudm-pp/v1/{ueId}/pp-data

This resource shall support the resource URI variables defined in table 6.5.3.2.2-1.

Table 6.5.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.5.1
ueld	string	Represents a single UE or a group of UEs.
		- If representing a single UE, this parameter shall contain the Generic Public Subscription Identifier (see 3GPP TS 23.501 [2] clause 5.9.8) or SUPI. pattern: See pattern of data type VarUeld in 3GPP TS 29.571 [7]
		- If representing a group of UEs, this parameter shall contain the External GroupId. pattern: "^extgroupid-[^@]+@[^@]+\$"

### 6.5.3.2.3 Resource Standard Methods

### 6.5.3.2.3.1 PATCH

This method shall support the URI query parameters specified in table 6.5.3.2.3.1-1.

Table 6.5.3.2.3.1-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	Р	Cardinality	Description
	SupportedFeat ures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.5.3.2.3.1-2 and the response data structures and response codes specified in table 6.5.3.2.3.1-3.

Table 6.5.3.2.3.1-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
PpData	М	1	Contains the data to be provisioned or the updated SoR Information to be
			conveyed to a UE.

Table 6.5.3.2.3.1-3: Data structures supported by the PATCH Response Body on this resource

Data type	Р	Cardinality	Response	Description
			codes	
n/a			204 No	Upon success, an empty response body shall be returned.
			Content	(NOTE 2)
PatchResult	М	1	200 OK	Upon success, the execution report is returned. (NOTE 2)
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate one of the
			Found	following application errors:
				- USER_NOT_FOUND
ProblemDetails	0	01	403	The "cause" attribute may be used to indicate one of the
			Forbidden	following application errors:
				- MODIFICATION_NOT_ALLOWED
				- DETACHED_USER
				- AF_NOT_ALLOWED
				- MTC_PROVIDER_NOT_ALLOWED

NOTE 1: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

NOTE 2: If all the modification instructions in the PATCH request have been implemented, the UDM 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 UDM shall respond with PatchResult.

# 6.5.3.3 Resource: 5GVnGroupConfiguration

#### 6.5.3.3.1 Description

This resource is used to represent 5G VN Group Configuration.

#### 6.5.3.3.2 Resource Definition

Resource URI: {apiRoot}/nudm-pp/v1/5g-vn-groups/{external-group-id}

This resource shall support the resource URI variables defined in table 6.5.3.3.2-1.

Table 6.5.3.3.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.5.1
external-	ExtGroupId	Represents the external Identifier of the 5G VN group
group-id		pattern: "^extgroupid-[^@]+@[^@]+\$"

#### 6.5.3.3.3 Resource Standard Methods

### 6.5.3.3.3.1 PUT

This method shall support the URI query parameters specified in table 6.5.3.3.1-1.

Table 6.5.3.3.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.5.3.3.3.1-2 and the response data structures and response codes specified in table 6.5.3.3.3.1-3.

Table 6.5.3.3.3.1-2: Data structures supported by the PUT Request Body on this resource

Data type	Р	Cardinality	Description
5GVnGroupConfi	M	1	Contains the configuration of the 5G VN Group
guration			

Table 6.5.3.3.3.1-3: Data structures supported by the PUT Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
n/a			201 Created	Upon success, an empty response shall be returned.
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors:  - CREATION_NOT_ALLOWED  - AF_NOT_ALLOWED  - MTC_PROVIDER_NOT_ALLOWED
NOTE: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.				

### 6.5.3.3.3.2 DELETE

This method shall support the URI query parameters specified in table 6.5.3.3.3.1-1.

Table 6.5.3.3.3.2-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	Р	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.5.3.3.3.1-2 and the response data structures and response codes specified in table 6.5.3.3.3.1-3.

Table 6.5.3.3.3.2-2: Data structures supported by the DELETE Request Body on this resource

Data type	Р	Cardinality	Description
n/a			

Table 6.5.3.3.3.2-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description		
n/a			204 No Content	Upon success, an empty response body shall be returned		
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - GROUP_IDENTIFIER_NOT_FOUND		
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors: - AF_NOT_ALLOWED - MTC_PROVIDER_NOT_ALLOWED		
NOTE: In addit						

### 6.5.3.3.3 PATCH

This method shall support the URI query parameters specified in table 6.5.3.3.3.1.

Table 6.5.3.3.3.1: URI query parameters supported by the PATCH method on this resource

Name	Data type	Р	Cardinality	Description
supported-	SupportedFeat	0	01	see 3GPP TS 29.500 [4] clause 6.6
features	ures			000 001 1 10 20.000 [1] olddod 0.0

This method shall support the request data structures specified in table 6.5.3.3.3.3-2 and the response data structures and response codes specified in table 6.5.3.3.3.3-3.

Table 6.5.3.3.3.2: Data structures supported by the PATCH Request Body on this resource

Data type	Р	Cardinality	Description
5GVnGroupConfi	М	1	Contains the modification instruction
guration			

Table 6.5.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

Р	Cardinality	Response	Description
		codes	
		204 No	Upon success, an empty response body shall be returned.
		Content	(NOTE 2)
М	1	200 OK	Upon success, the execution report is returned. (NOTE 2)
0	01	404 Not	The "cause" attribute may be used to indicate one of the
		Found	following application errors:
			- GROUP_IDENTIFIER_NOT_FOUND
0	01	403	The "cause" attribute may be used to indicate one of the
		Forbidden	following application errors:
			- MODIFICATION_NOT_ALLOWED
			- AF_NOT_ALLOWED
			- MTC_PROVIDER_NOT_ALLOWED
	M	M 1 O 01	Codes   204 No   Content   M   1   200 OK   O   01   404 Not   Found   O   01   403

NOTE 1: In addition common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

NOTE 2: If all the modification instructions in the PATCH request have been implemented, the UDM 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.

6.5.3.3.4 GET

This method shall support the URI query parameters specified in table 6.5.3.3.3.4-1.

Table 6.5.3.3.3.4-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
N/A				

This method shall support the response data structures and response codes specified in table 6.5.3.3.3.4-2.

Table 6.5.3.3.3.4-2: Data structures supported by the GET Request Body on this resource

Data type	Р	Cardinality	Description
N/A			

Table 6.5.3.3.3.4-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
5GVnGroupConfi guration			200 OK	
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - GROUP_IDENTIFIER_NOT_FOUND
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors: - AF_NOT_ALLOWED

# 6.5.4 Custom Operations without associated resources

In this release of this specification, no custom operations without associated resources are defined for the Nudm\_ParameterProvision Service.

## 6.5.5 Notifications

In this release of this specification, no notifications are defined for the Nudm\_ParameterProvision Service.

# 6.5.6 Data Model

### 6.5.6.1 General

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

Table 6.5.6.1-1 specifies the data types defined for the Nudm\_PP service API.

Table 6.5.6.1-1: Nudm\_PP specific Data Types

Data type	Clause defined	Description			
PpData	6.5.6.2.2	Parameter Provision Data			
CommunicationCharacteristics	6.5.6.2.3	Communication Characteristics			
PpSubsRegTimer	6.5.6.2.4				
PpActiveTime	6.5.6.2.5				
5GVnGroupConfiguration	6.5.6.2.6				
5GVnGroupData	6.5.6.2.7				
ExpectedUeBehaviour	6.5.6.2.8	Expected UE Behaviour Parameters			
LocationArea	6.5.6.2.10	Location Area			
NetworkAreaInfo	6.5.6.2.11	Network Area Information			
EcRestriction	6.5.6.2.12				
PlmnEcInfo	6.5.6.2.13				
PpDIPacketCountExt	6.5.6.2.14				
PpMaximumResponseTime	6.5.6.2.15				
PpMaximumLatency	6.5.6.2.16				
LcsPrivacy	6.5.6.2.17				
ReferenceId	6.5.6.3.2				
PpDIPacketCount	6.5.6.3.2				

Table 6.5.6.1-2 specifies data types re-used by the Nudm\_PP service API from other APIs, including a reference and when needed, a short description of their use within the Nudm\_PP service API.

Table 6.5.6.1-2: Nudm\_PP re-used Data Types

Data type	Reference	Comments		
DurationSec	3GPP TS 29.571 [7]	Time value in seconds		
DurationSecRm	3GPP TS 29.571 [7]	Time value in seconds; nullable		
SupportedFeatures	3GPP TS 29.571 [7]			
NfInstanceId	3GPP TS 29.571 [7]			
ProblemDetails	3GPP TS 29.571 [7]			
Gpsi	3GPP TS 29.571 [7]			
PatchResult	3GPP TS 29.571 [7]			
DateTime	3GPP TS 29.571 [7]			
Ecgi	3GPP TS 29.571 [7]	an EUTRA cell identifier		
Ncgi	3GPP TS 29.571 [7]	an NR cell identifier		
GlobalRanNodeld	3GPP TS 29.571 [7]	an identity of the NG-RAN node		
Tai	3GPP TS 29.571 [7]	a tracking area identity		
GeographicArea	3GPP TS 29.572 [34]	Identifies the geographical information of the user(s).		
CivicAddress	3GPP TS 29.572 [34]	Identifies the civic address information of the user(s).		
PduSessionType	3GPP TS 29.571 [7]			
AppDescriptor	6.1.6.2.40			
AcsInfoRm	3GPP TS 29.571 [7]			
StnSrRm	3GPP TS 29.571 [7]	Session Transfer Number for SRVCC		
Supi	3GPP TS 29.571 [7]			
Lpi	6.1.6.2.43			
MtcProviderInformation	3GPP TS 29.571 [7]	MTC Provider Information		
StationaryIndicationRm	3GPP TS 29.571 [7]			
ScheduledCommunicationTimeRm	3GPP TS 29.571 [7]			
ScheduledCommunicationTypeRm	3GPP TS 29.571 [7]			
TrafficProfileRm	3GPP TS 29.571 [7]			
BatteryIndicationRm	3GPP TS 29.571 [7]			

# 6.5.6.2 Structured data types

## 6.5.6.2.1 Introduction

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

# 6.5.6.2.2 Type: PpData

Table 6.5.6.2.2-1: Definition of type PpData

Attribute name	Data type	P	Cardinality	Description
supportedFeatures	SupportedFeatures	0	01	
communicationCharacteristics	CommunicationCharacteri stics	0	01	communication characteristics
expectedUeBehaviour	ExpectedUeBehaviour	0	01	Expected UE Behaviour Parameters
ecRestriction	EcRestriction	0	01	Enhanced Coverage Restriction Parameters
acsInfo	AcsInfoRm	0	01	Identifies the ACS Information (see TS 23.316 [37] clause 9.6.3); nullable.
stnSr	StnSrRm	0	01	Session Transfer Number for SRVCC
IcsPrivacy	LcsPrivacy	0	01	LCS Privacy Parameters (see clause 5.4.3 of 3GPP TS 23.273 [38])
sorInfo	SorInfo	0	01	Steering of Roaming information to be conveyed to a UE See NOTE°1 and NOTE°2.

NOTE°1: If the UDM is not able to immediately (after conducting integrity protection with the AUSF) convey the received Steering of Roaming information to the concerned UE for any reason (e.g. no AMF registered for the UE), it shall discard it.

NOTE°2: The behaviour of the UDM at reception of Steering of Roaming information within PpData is specified in Annex C.3 of 3GPP°TS°23.122°[20].

## 6.5.6.2.3 Type: CommunicationCharacteristics

Table 6.5.6.2.3-1: Definition of type CommunicationCharacteristics

Attribute name	Data type	Р	Cardinality	Description
ppSubsRegTimer	PpSubsRegTimer	0	01	AF provisionedSubscribed periodic registration
				timer,nullable (NOTE 2)
ppActiveTime	PpActiveTime	0	01	AF provisioned active time; nullable (NOTE 2)
ppDIPacketCount	PpDIPacketCount	0	01	AF provisioned DL Buffering Suggested Packet
				Count; nullable
ppDIPacketCountExt	PpDIPacketCount	С	01	AF provisioned DL Buffering Suggested Packet
	Ext			Count Extension; nullable.
				Shall be absent if ppDIPacketCount is absent, and
				shall be null if ppDIPacketCount is null.
ppMaximumResponseTi	PpMaximumResp	0	01	AF provisioned Maximum Response Time; nullable
me	onseTime			
ppMaximumLatency	PpMaximumLate	0	01	AF provisioned Maximum Latency; nullable
_	ncy			

NOTE 1: If ppDIPacketCountExt is absent and ppDIPacketCount (whether the value is null or not) is present in a modification request, it shall result in deletion of ppDIPacketCountExt.

NOTE 2: These IEs are deprecated. An NF service consumer (i.e. AF) supporting this release shall use ppMaximumResponseTime IE to influence the Subscribed Active Time of the UE; use ppMaximumLatency IE to influence the Subscribed Periodic Registration Timer of the UE.

# 6.5.6.2.4 Type: PpSubsRegTimer

Table 6.5.6.2.4-1: Definition of type PpSubsRegTimer

Attribute name	Data type	Р	Cardinality	Description
subsRegTimer	DurationSec	М	1	value in seconds
afInstanceId	string	М	1	The string identifying the originating AF (NOTE)
referenceld	ReferenceId	М	1	Transaction Reference ID
validityTime	DateTime	0	01	Identifies the point of time up to which the subsRegTimer parameter expires and it shall be deleted. If absent, it indicates that there is no expiration time for these expected UE parameters. If this IE is in request body, it indicates the expected validity time by consumer. If this IE is in response body, it indicates the confirmed validity time by UDM.
mtcProviderInformation	MtcProviderInfor	0	01	Indicates MTC provider information for Parameter
	mation			Provisioning authorization.

NOTE: When the service operation is originated by external AF via T8/N33 interface, information carried in {scsAsId} URI variable in resource URIs on T8/N33 interface (see clause 5 of 3GPP TS 29.122 [45]) or in {afId} URI variable in resource URIs on N33 interface (see clause 5 of 3GPP TS 29.522 [54]) can be used as the value for this IE.

6.5.6.2.5 Type: PpActiveTime

Table 6.5.6.2.5-1: Definition of type PpActiveTime

Attribute name	Data type	Р	Cardinality	Description
activeTime	DurationSec	М	1	value in seconds
afInstanceId	string	М	1	The string identifying the originating AF (NOTE).
referenceld	ReferenceId	М	1	Transaction Reference ID
validityTime	DateTime	0	01	Identifies the point of time up to which the activeTime parameter expires and it shall be deleted. If absent, it indicates that there is no expiration time for these expected UE parameters. If this IE is in request body, it indicates the expected validity time by consumer. If this IE is in response body, it indicates the confirmed validity time by UDM.
mtcProviderInformation	MtcProviderInfor mation	0	01	Indicates MTC provider information for Parameter Provisioning authorization.

NOTE: When the service operation is originated by external AF via T8/N33 interface, information carried in {scsAsId} URI variable in resource URIs on T8/N33 interface (see clause 5 of 3GPP TS 29.122 [45]) or in {afId} URI variable in resource URIs on N33 interface (see clause 5 of 3GPP TS 29.522 [54]) can be used as the value for this IE.

6.5.6.2.6 Type: 5GVnGroupConfiguration

Table 6.5.6.2.6-1: Definition of type 5GVnGroupConfiguration

Attribute name	Data type	P	Cardinality	Description
5gVnGroupData	5GVnGroupData	С	01	Data of the 5G VN Group; may be absent in
				modification requests; shall be present otherwise
members	array(Gpsi)	С	1N	List of group members; may be absent in
				modification requests; shall be present in creation
				requests
referenceId	ReferenceId	С	1	Transaction Reference ID; shall be absent in
				modification requests; shall be present otherwise.
afInstanceId	string	С	1	The string identifying the originating AF (NOTE)
internalGroupIdentifier	GroupId	С	01	Allocated by the UDR; shall be present in successful
				PUT and GET responses on Nudr; otherwise shall
				be absent.
mtcProviderInformation	MtcProviderInfor	0	01	Indicates MTC provider information for 5G VN Group
	mation			Configuration authorization.

NOTE: When the service operation is originated by external AF via T8/N33 interface, information carried in {scsAsId} URI variable in resource URIs on T8/N33 interface (see clause 5 of 3GPP TS 29.122 [45]) or in {afId} URI variable in resource URIs on N33 interface (see clause 5 of 3GPP TS 29.522 [54]) can be used as the value for this IE.

6.5.6.2.7 Type: 5GVnGroupData

Table 6.5.6.2.7-1: Definition of type 5GVnGroupData

Attribute name	Data type	Р	Cardinality	Description
dnn	Dnn	M	1	DNN of the 5G VN group, shall contain the Network
				Identifier only.
sNssai	Snssai	M	1	S-NSSAI of the 5G VN group's communication
				session
pduSessionTypes	array(PduSessio	0	1N	List of PDU Session Types allowed for 5G VN
	nType)			group's communication session
appDescriptors	array(AppDescrip	0	1N	List of Application Descriptors allowed for 5G VN
	tor)			group's communication session
secondaryAuth	boolean	0	01	Indicates whether secondary authentication and
				authorization is needed.
				true: secondary authentication and authorization is
				needed.
				false: secondary authentication and authorization is not needed.
				If absent, it indicates that secondary authentication is
				not required by the NEF, but it still may be required
				by local policies at the SMF.
dnAaaAddress	IpAddress	0	01	The address information of DN-AAA server, used for
				secondary authentication and authorization.

6.5.6.2.8 Type: ExpectedUeBehaviour

Table 6.5.6.2.8-1: Definition of type ExpectedUeBehaviour

Attribute name	Data type	Р	Cardinality	Description
afInstanceId	string	М	1	The string identifying the originating AF (NOTE 5)
referenceld	ReferenceId	М	1	Identifies transaction reference ID genetrated by NEF.
stationaryIndication	StationaryIndicati onRm	0	01	Identifies whether the UE is stationary or mobile(see TS 23.502 [3] clause 4.15.6.3); nullable.
communicationDuration Time	DurationSecRm	0	01	Indicates for how long the UE will normally stay in CM-Connected for data transmission(see TS 23.502 [3] clause 4.15.6.3); nullable.
periodicTime	DurationSecRm	0	01	Identifies interval time of periodic communication (see TS 23.502 [3] clause 4.15.6.3); nullable.
scheduledCommunicati onTime	ScheduledComm unicationTimeRm	0	01	Identifies time and day of the week when the UE is available for communication(see TS 23.502 [3] clause 4.15.6.3); nullable.
scheduledCommunicati onType	ScheduledComm unicationTypeRm	0	01	Indicates that the Scheduled Communication Type (see TS 23.502 [3] clause 4.15.6.3); nullable. (Note 4)
expectedUmts	array(LocationAr ea)	0	1N	Identifies the UE's expected geographical movement. The attribute is only applicable in 5G(see TS 23.502 [3] clause 4.15.6.3); nullable. (NOTE 3)
trafficProfile	TrafficProfileRm	0	01	Identifies the type of data transmission: single packet transmission (UL or DL), dual packet transmission (UL with subsequent DL or DL with subsequent UL), multiple packets transmission; nullable
batteryIndication	BatteryIndication Rm	0	01	Indicates the power consumption type(s) of the UE (see TS 23.502 [3] clause 4.15.6.3); nullable.
validityTime	DateTime	0	01	If present, identifies when the expected UE behaviour parameters expire and shall be deleted locally if it expire(see TS 23.502 [3] clause 4.15.6.3). If this IE is in request body, it indicates the expected validity time by consumer. If this IE is in response body, it indicates the confirmed validity time by UDM. (NOTE 2)
mtcProviderInformation	MtcProviderInfor mation	0	01	Indicates MTC provider information for UE Parameter Configuration authorization.

- NOTE 1: At least one of optional parameters (expect for validityTime) above shall be present.
- NOTE 2: If this attribute is omitted, no expiry for the expected UE behaviour parameters applies.
- NOTE 3: The first instance of the attribute represents the start of the location, and the last one represents the stop of the location.
- NOTE 4: The parameter "scheduledCommunicationType" shall be used together with the parameter "scheduledCommunicationTime".
- NOTE 5: When the service operation is originated by external AF via T8/N33 interface, information carried in {scsAsId} URI variable in resource URIs on T8/N33 interface (see clause 5 of 3GPP TS 29.122 [45]) or in {afId} URI variable in resource URIs on N33 interface (see clause 5 of 3GPP TS 29.522 [54]) can be used as the value for this IE.

6.5.6.2.9 Void

6.5.6.2.10 Type: LocationArea

Table 6.5.6.2.10-1: Definition of type LocationArea

Attribute name	Data type	Р	Cardinality	Description
goographic A roop	array(Geographic	0	0N	Identifies a list of geographic area of the user where
geographicAreas	Area)			the UE is located.
air i a A alaba a a a a	array(CivicAddre	0	0N	Identifies a list of civic addresses of the user where
civicAddresses	ss)			the UE is located.
nu Araalafa	NetworkAreaInfo	0	01	This IE represents the network area information of
nwAreaInfo				the user where the UE is located.

6.5.6.2.11 Type: NetworkAreaInfo

Table 6.5.6.2.11-1: Definition of type NetworkAreaInfo

Attribute name	Data type	Р	Cardinality	Description	
ecgis	array(Ecgi)	0	0N	This IE contains a list of E-UTRA cell identities.	
ncgis	array(Ncgi)	0	0N	This IE contains a list of NR cell identities.	
gRanNodelds	array(GlobalRan	0	0N	This IE contains a list of the NG-RAN nodes.	
	Nodeld)			The "n3lwfld" attribute within the "GlobalRanNodeld"	
				data type shall not be supplied.	
tais	array(Tai)	0	0N	This IE contains a list of tracking area identities.	
NOTE: The NetworkAreaInfo data type allows any combination of defined properties.					

6.5.6.2.12 Type: EcRestriction

Table 6.5.6.2.12-1: Definition of type EcRestriction

Attribute name	Data type	Р	Cardinality	Description
afInstanceId	string	М	1	The string identifying the originating AF (NOTE)
referenceId	ReferenceId	М	1	Transaction Reference ID
plmnEcInfos	array(PlmnEcInfo )	0		It may indicate a complete list of serving PLMNs where Enhanced Coverage shall be allowed and the detailed enhanced coverage restriction configuration under per the PLMN.
mtcProviderInformati	MtcProviderInfor	0	01	Indicates MTC provider information for Enhanced
on	mation			Coverage Configuration authorization.

NOTE: When the service operation is originated by external AF via T8/N33 interface, information carried in scsAsId attribute in ECRControl structured data type (see clause 5.12.2.1.2 of 3GPP TS 29.122 [45]) can be used as the value for this IE.

6.5.6.2.13 Type: PlmnEcInfo

Table 6.5.6.2.13-1: Definition of type PlmnEcInfo

Attribute name	Data type	Р	Cardinality	Description
plmnld	Plmnld	М	1	Indicates PLMN where Enhanced Coverage shall be restricted.
ecRestrictionDataWb	EcRestrictionDat aWb	0	01	If present, it shall contain Enhanced Coverage Restriction Data for WB-N1 mode. If absent, it shall indicate that Enhanced Coverage is not restricted for WB-N1 mode.
ecRestrictionDataNb	boolean	0	01	If present, this IE shall indicate whether Enhanced Coverage for NB-N1 mode is restricted or not.  true: Enhanced Coverage for NB-N1 mode is restricted. false or absent: Enhanced Coverage for NB-N1
NOTE: At least one	of the properties "o	cPos	triction Data Wh	mode is allowed. " and "ecRestrictionDataNb" shall be included.

6.5.6.2.14 Type: PpDIPacketCountExt

Table 6.5.6.2.14-1: Definition of type PpDIPacketCountExt

Attribute name	Data type	P	Cardinality	Description
afInstanceId	string	М	1	The string identifying the originating AF (NOTE)
referenceld	ReferenceId	М	1	Transaction Reference ID
validityTime	DateTime	0	01	Identifies the point of time up to which the value of parameter ppDIPacketCount expires and it shall be deleted. If absent, it indicates that there is no expiration time for these expected UE parameters. If this IE is in request body, it indicates the expected validity time by consumer.  If this IE is in response body, it indicates the confirmed validity time by UDM.
mtcProviderInformation	MtcProviderInfor mation	0	01	Indicates MTC provider information for Parameter Provisioning authorization.

NOTE: When the service operation is originated by external AF via T8/N33 interface, information carried in {scsAsId} URI variable in resource URIs on T8/N33 interface (see clause 5 of 3GPP TS 29.122 [45]) or in {afId} URI variable in resource URIs on N33 interface (see clause 5 of 3GPP TS 29.522 [54]) can be used as the value for this IE.

6.5.6.2.15 Type: PpMaximumResponseTime

Table 6.5.6.2.15-1: Definition of type PpMaximumResponseTime

Attribute name	Data type	Р	Cardinality	Description
maximumResponseTim	DurationSec	М	1	This IE shall contain value of Maximum Response
е				Time in seconds.
				Maximum Response Time identifies the time for
				which the UE stays reachable to allow the AF to
				reliably deliver the required downlink data, see
				clause 4.15.6.3a of 3GPP TS 23.502 [3].
afInstanceId	string	М	1	The string identifying the originating AF (NOTE)
referenceId	ReferenceId	M	1	Transaction Reference ID
validityTime	DateTime	0	01	Identifies the point of time up to which the value of
				maximumResponseTime expires and it shall be
				deleted. If absent, it indicates that there is no
				expiration time.
				If this IE is in request body, it indicates the expected
				validity time by consumer.
				If this IE is in response body, it indicates the
				confirmed validity time by UDM.
mtcProviderInformation	MtcProviderInfor	0	01	Indicates MTC provider information for Parameter
	mation			Provisioning authorization.

NOTE: When the service operation is originated by external AF via T8/N33 interface, information carried in {scsAsId} URI variable in resource URIs on T8/N33 interface (see clause 5 of 3GPP TS 29.122 [45]) or in {afId} URI variable in resource URIs on N33 interface (see clause 5 of 3GPP TS 29.522 [54]) can be used as the value for this IE.

6.5.6.2.16 Type: PpMaximumLatency

Table 6.5.6.2.16-1: Definition of type PpMaximumLatency

Attribute name	Data type	Ρ	Cardinality	Description
maximumLatency	DurationSec	М	1	This IE shall contain value of Maximum Latency in
				seconds.
				Maximum Latency identifies maximum delay
				acceptable for downlink data transfers, see clause
				4.15.6.3a of 3GPP TS 23.502 [3].
afInstanceId	string	М	1	The string identifying the originating AF (NOTE).
referenceld	ReferenceId	М	1	Transaction Reference ID
validityTime	DateTime	0	01	Identifies the point of time up to which the value of
				maximumLatency expires and it shall be deleted. If
				absent, it indicates that there is no expiration time.
				If this IE is in request body, it indicates the expected
				validity time by consumer.
				If this IE is in response body, it indicates the
				confirmed validity time by UDM.
mtcProviderInformation	MtcProviderInfor	0	01	Indicates MTC provider information for Parameter
	mation			Provisioning authorization.

NOTE: When the service operation is originated by external AF via T8/N33 interface, information carried in {scsAsld} URI variable in resource URIs on T8/N33 interface (see clause 5 of 3GPP TS 29.122 [45]) or in {afld} URI variable in resource URIs on N33 interface (see clause 5 of 3GPP TS 29.522 [54]) can be used as the value for this IE.

6.5.6.2.17 Type: LcsPrivacy

Table 6.5.6.2.17-1: Definition of type LcsPrivacy

Attribute name	Data type	Р	Cardinality	Description
afInstanceId	string	С	01	When present, indicates NF Instance Id of the originating AF/NF. (NOTE)
referenceId	ReferenceId	С	01	This IE shall be present if LCS privacy parameters are provisioned by an AF.  When present, indicates Transaction Reference ID (NOTE)
lpi	Lpi	0	01	If present, indicates the Location Privacy Indication
mtcProviderInformation	MtcProviderInformation	0	01	Indicates MTC provider information for LCS privacy parameter configuration authorization.

NOTE: If LCS privacy parameters are provisioned by UE, parameters afInstanceId and referenceId shall be not included, and if LCS privacy parameters are provisioned by AF, parameters afInstanceId and referenceId shall be included. The string identifying the originating AF, which is carried in {scsAsId} URI variable in resource URIs on T8/N33 interface (see clause 5 of 3GPP TS 29.122 [45]) or in {afId} URI variable in resource URIs on N33 interface (see clause 5 of 3GPP TS 29.522 [54]).

# 6.5.6.3 Simple data types and enumerations

## 6.5.6.3.1 Introduction

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

#### 6.5.6.3.2 Simple data types

The simple data types defined in table 6.5.6.3.2-1 shall be supported.

Table 6.5.6.3.2-1: Simple data types

Type Name	Type Definition	Description
ReferenceId	integer	The numeric value should not be higher than 2^64-1 (i.e. it should be possible to convey it in an unsigned 64 integer Information Element, used in other protocols), if interworking with the Event Exposure framework in EPC is required.
PpDIPacketCount	integer	nullable

6.5.6.3.3 Void

6.5.6.3.4 Void

# 6.5.7 Error Handling

#### 6.5.7.1 General

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

#### 6.5.7.2 Protocol Errors

Protocol errors handling shall be supported as specified in clause 5.2.7 of 3GPP TS 29.500 [4].

# 6.5.7.3 Application Errors

The common application errors defined in the Table 5.2.7.2-1 in 3GPP TS 29.500 [4] may also be used for the Nudm\_ParameterProvision service. The following application errors listed in Table 6.5.7.3-1 are specific for the Nudm\_ParameterProvision service.

The application errors defined for the Nudm\_UECM service are listed in Table 6.5.7.3-1.

Table 6.5.7.3-1: Application errors

Application Error	HTTP status code	Description
MODIFICATION_NOT_ALLOWED	403 Forbidden	The subscriber does not have the necessary subscription for external parameter provisioning.
USER_NOT_FOUND	404 Not Found	The User does not exist.
CREATION_NOT_ALLOWED	403 Forbidden	Creation of a 5G VN Group is not allowed.
DETACHED_USER	403 Forbidden	The user is detached in the Network.
GROUP_IDENTIFIER_NOT_FOUND	404 Not Found	The group does not exist
AF_NOT_ALLOWED	403 Forbidden	This AF is not allowed to perform external provisioning or 5G VN Group creation.
MTC_PROVIDER_NOT_ALLOWED	403 Forbidden	MTC Provider not authorized to perform external provisioning or 5G VN Group creation.

# 6.5.8 Feature Negotiation

The optional features in table 6.5.8-1 are defined for the Nudm\_PP API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

**Table 6.5.8-1: Supported Features** 

Feature number	Feature Name	Description
1	,	If some of the modifications included in the PATCH request are not successfully implemented, the UDM reports the result of PATCH
		request execution to the consumer. See clause 5.2.7.2 of 3GPP TS 29.500 [4].

# 6.5.9 Security

As indicated in 3GPP TS 33.501 [6] and 3GPP TS 29.500 [4], the access to the Nudm\_PP API may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [18]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [19]) plays the role of the authorization server.

If OAuth2 is used, an NF Service Consumer, prior to consuming services offered by the Nudm\_PP API, shall obtain a "token" from the authorization server, by invoking the Access Token Request service, as described in 3GPP TS 29.510 [19], clause 5.8.2.2.

NOTE: When multiple NRFs are deployed in a network, the NRF used as authorization server is the same NRF that the NF Service Consumer used for discovering the Nudm\_PP service.

The Nudm\_PP API defines a single scope "nudm-pp" for OAuth2 authorization (as specified in 3GPP TS 33.501 [6]) for the entire API, and it does not define any additional scopes at resource or operation level.

# 6.6 Nudm\_NIDDAuthorization Service API

## 6.6.1 API URI

The Nudm\_NIDDAuthorization service shall use the Nudm\_NIDDAU API.

The API URI of the Nudm\_NIDDAU API shall be:

#### {apiRoot}/<apiName>/<apiVersion>/

The request URI used in HTTP request from the NF service consumer towards the NF service producer shall have the structure defined in clause 4.4.1 of 3GPP TS 29.501 [5], i.e.:

#### {apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [5].
- The <apiName> shall be "nudm-niddau".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 6.6.3.

# 6.6.2 Usage of HTTP

#### 6.6.2.1 General

HTTP/2, as defined in IETF RFC 7540 [13], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

HTTP/2 shall be transported as specified in clause 5.3 of 3GPP TS 29.500 [4].

HTTP messages and bodies for the Nudm\_NIDDAuthorization service shall comply with the OpenAPI [14] specification contained in Annex A.7.

#### 6.6.2.2 HTTP standard headers

#### 6.6.2.2.1 General

The usage of HTTP standard headers shall be supported as specified in clause 5.2.2 of 3GPP TS 29.500 [4].

#### 6.6.2.2.2 Content type

The following content types shall be supported:

JSON, as defined in IETF RFC 8259 [15], signalled by the content type "application/json".

The Problem Details JSON Object (IETF RFC 7807 [16] signalled by the content type "application/problem+json"

#### 6.6.2.3 HTTP custom headers

#### 6.6.2.3.1 General

The usage of HTTP custom headers shall be supported as specified in clause 5.2.3 of 3GPP TS 29.500 [4].

## 6.6.3 Resources

#### 6.6.3.1 Overview

Figure 6.6.3.1-1 describes the resources supported by the Nudm\_NIDDAU API.

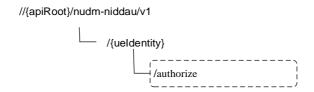


Figure 6.6.3.1-1: Resource URI structure of the nudm-niddau API

Table 6.6.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.6.3.1-1: Resources and methods overview

Resource name (Archetype)	Resource URI	HTTP method or custom operation	Description
ueldentity (Document)		authorize (POST)	Authorize the NIDD configuration request.

# 6.6.3.2 Resource: ueldentity (Document)

## 6.6.3.2.1 Description

This resource represents the UE's subscribed NIDD authorization information for a GPSI or External Group Identifier.

# 6.6.3.2.2 Resource Definition

 $Resource\ URI:\ \{apiRoot\}/nudm-niddau/< apiVersion>/\{ueIdentity\}$ 

This resource shall support the resource URI variables defined in table 6.6.3.2.2-1.

Table 6.6.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.6.1
ueldentity	string	Represents the GPSI or External Group Identifier (see 3GPP TS 23.501 [2] clause 7.2.5)
		pattern: "^ (msisdn-[0-9]{5,15} extid-[^@]+@[^@]+ extgroupid-[^@]+@[^@]+ .+)\$"

#### 6.6.3.2.3 Resource Standard Methods

No Standard Methods are supported for this resource.

# 6.6.3.2.4 Resource Custom Operations

#### 6.6.3.2.4.1 Overview

Table 6.6.3.2.4.1-1: Custom operations

Custom operation URI	Mapped HTTP method	Description
/authorize		Authorize the NIDD configuration request.
	Custom operation URI	/authorize POST

#### 6.6.3.2.4.2 Operation: authorize

#### 6.6.3.2.4.2.1 Description

This custom operation is used by the NF service consumer (NEF) to request UDM to authorize the NIDD configuration request for the GPSI/External Group Identifier.

#### 6.6.3.2.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.6.3.2.4.2.2-1 and the response data structure and response codes specified in table 6.6.3.2.4.2.2-2.

Table 6.6.3.2.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	Р	Cardinality	Description
AuthorizationInfo	M	1	Contains NSSAI, DNN, MTC Provider Information, callback URI.

Table 6.6.3.2.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	Р	Cardinality	Response codes	Description
AuthorizationDat a	М	1	200 OK	Upon success, a response body containing the SUPI(s) and GPSI shall be returned.
ProblemDetails	0	1	404 Not Found	The "cause" attribute may be used to indicate one of the following application errors: - USER_NOT_FOUND
ProblemDetails	0	01	403 Forbidden	The "cause" attribute may be used to indicate one of the following application errors: - DNN_NOT_ALLOWED - MTC_PROVIDER_NOT_ALLOWED - AF_INSTANCE_NOT_ALLOWED
NOTE: In additi	on co	mmon data str	uctures as list	ed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.

# 6.6.4 Custom Operations without associated resources

In this release of this specification, no custom operations without associated resources are defined for the Nudm\_SubscriberDataManagement Service.

#### 6.6.5 Notifications

#### 6.6.5.1 General

This clause will specify the use of notifications and corresponding protocol details if required for the specific service. When notifications are supported by the API, it will include a reference to the general description of notifications support over the 5G SBIs specified in 3GPP TS 29.500 [4] / 3GPP TS 29.501 [5].

## 6.6.5.2 Nidd Authorization Data Update Notification

The POST method shall be used for Nidd Authorization Data Update Notifications and the Call-back URI shall be provided during the NIDD Authorization Data Retrieval procedure. UDM should continuously generate NIDD authorization Data Update Notifications to service consumer (NEF) for UE for the event until validity time related to the UE expires, and if validity time expires, it indicates unsubscription to notification for the UE.

Resource URI: {callbackReference}

Support of URI query parameters is specified in table 6.6.5.2-1.

Table 6.6.5.2-1: URI query parameters supported by the POST method

Name	Data type	Р	Cardinality	Description
n/a				

Support of request data structures is specified in table 6.6.5.2-2 and of response data structures and response codes is specified in table 6.6.5.2-3.

Table 6.1.5.2-2: Data structures supported by the POST Request Body

Data type	Р	Cardinality	Description
NiddAuthUpdateNotifi	М	1	
cation			

Table 6.6.5.2-3: Data structures supported by the POST Response Body

Data	type	Р	Cardinality	Response	Description	
				codes		
n/a				204 No	Upon success, an empty response body shall be returned.	
				Content		
NOTE: In addition common data structures as listed in table 6.6.7-1 are supported.						

# 6.6.6 Data Model

#### 6.6.6.1 General

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

Table 6.6.6.1-1 specifies the structured data types defined for the Nudm\_NIDDAU service API. For simple data types defined for the Nudm\_NIDDAU service API see table 6.6.6.3.2-1.

Table 6.6.6.1-1: Nudm\_NIDDAU specific Data Types

Data type	Clause defined	Description
AuthorizationData	6.6.6.2.2	
Userldentifier	6.6.6.2.3	
NiddAuthUpdateInfo	6.6.6.2.4	
NiddAuthUpdateNotification	6.6.6.2.5	
AuthorizationInfo	6.6.6.2.6	

Table 6.6.6.1-2 specifies data types re-used by the Nudm\_NIDDAU service API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nudm\_NIDDAU service API.

Table 6.6.6.1-2: Nudm\_NIDDAU re-used Data Types

Data type	Reference	Comments			
Nssai	6.1.6.2.2	Network Slice Selection Assistance Information			
Gpsi	3GPP TS 29.571 [7]	Generic Public Subscription Identifier			
Supi	3GPP TS 29.571 [7]				
Dnn	3GPP TS 29.571 [7]	Data Network Name with Network Identifier only.			
MtcProviderInformation	3GPP TS 29.571 [7]				
DateTime	3GPP TS 29.571 [7]				
Snssai	3GPP TS 29.571 [7]				
Uri	3GPP TS 29.571 [7]				

# 6.6.6.2 Structured data types

## 6.6.6.2.1 Introduction

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

6.6.6.2.2 Type: AuthorizationData

Table 6.6.6.2.2-1: Definition of type AuthorizationData

Attribute name	Data type	Р	Cardinality	Description
authorizationData	array(UserIdentifier)	М	1N	May contain a single value or list of (SUPI and GPSI). Contains unique items.
validityTime	DateTime	0	01	Indicates the granted validity time of the authorisation result. If absent, it indicates the authorisation result is valid permanently

6.6.6.2.3 Type: UserIdentifier

Table 6.6.6.2.3-1: Definition of type UserIdentifier

Attribute name	Data type	Р	Cardinality	Description
supi	Supi	M	1	
gpsi	Gpsi	0	01	
validityTime	DateTime	0	01	Indicates the granted validity time of the authorisation result for this user.  If absent, the value of the validity time in the AuthorizationData is used for this user if it is present in AuthorizationData.  If present, this value has higher priority than the value in the AuthorizationData.

6.6.6.2.4 Type: NiddAuthUpdateInfo

Table 6.6.6.2.4-1: Definition of type NiddAuthUpdateInfo

Attribute name	Data type	Р	Cardinality	Description
authorizationData	AuthorizationData	М	1	This IE shall include the Authorization data.
invalidityInd	boolean	0	01	Indicates whether the authorized NIDD authoration data is still valid or not. true: the authorized NIDD authoration data is not valid. false or absent: the authorized NIDD authoration data is valid.

6.6.6.2.5 Type: NiddAuthUpdateNotification

Table 6.6.6.2.5-1: Definition of type NiddAuthUpdateNotification

Attribute name	Data type	Р	Cardinality	Description	
niddAuthUpdateInfoList	array(NiddAuthUpdat	M	1N	List of NiddAuthUpdateInfo.	
	elnfo)				

6.6.6.2.6 Type: AuthorizationInfo

Table 6.6.6.2.6-1: Definition of type AuthorizationInfo

Attribute name	Data type	Р	Cardinality	Description
snssai	Snssai	М	1	Indicates Single Network Slice Selection Assistance Information for NIDD authorization.
dnn	Dnn	М	1	Indicates DNN for NIDD authorization, shall contain the Network Identifier only.
mtcProviderInformation	MtcProviderInformati on	М	1	Indicates MTC provider information for NIDD authorization.
authUpdateCallbackUri	Uri	M	1	A URI provided by NEF to receive (implicitly subscribed) notifications on authorization data update.  The authUpdateCallbackUri URI shall have unique information within NEF to identify the authorized result.
afld	string	0	01	When present, indicates the string identifying the originating AF, which is carried in {scsAsId} URI variable in resource URIs on T8/N33 interface (see clause 5 of 3GPP TS 29.122 [45]) or in {afId} URI variable in resource URIs on N33 interface (see clause 5 of 3GPP TS 29.522 [54])

# 6.6.6.3 Simple data types and enumerations

## 6.6.6.3.1 Introduction

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

#### 6.6.6.3.2 Simple data types

The simple data types defined in table 6.6.6.3.2-1 shall be supported.

Table 6.6.6.3.2-1: Simple data types

Type Name Type Definition		Description			

# 6.6.7 Error Handling

# 6.6.7.1 General

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

# 6.6.7.2 Protocol Errors

Protocol errors handling shall be supported as specified in clause 5.2.7 of 3GPP TS 29.500 [4].

# 6.6.7.3 Application Errors

The common application errors defined in the Table 5.2.7.2-1 in 3GPP TS 29.500 [4] may also be used for the Nudm\_NIDD Authorization service. The following application errors listed in Table 6.6.7.3-1 are specific for the Nudm\_NIDD Authorization service.

Table 6.6.7.3-1: Application errors

Application Error	HTTP status	Description	
	code		
UNKNOWN_5GS_SUBSCRIPTION	403 Forbidden	No 5GS subscription is associated with the user.	
USER_NOT_FOUND	404 Not Found	The user does not exist in the HPLMN	
DNN_NOT_ALLOWED	403 Forbidden	DNN not authorized for the user	
MTC_PROVIDER_NOT_ALLOWED	403 Forbidden	MTC Provider not authorized	
AF_INSTANCE_NOT_ALLOWED	403 Forbidden	This AF instance is not authorized	

# 6.6.8 Feature Negotiation

The optional features in table 6.6.8-1 are defined for the Nudm\_NIDDAU API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

Table 6.6.8-1: Supported Features

Feature number	Feature Name	Description			

# 6.6.9 Security

As indicated in 3GPP TS 33.501 [6] and 3GPP TS 29.500 [4], the access to the Nudm\_NIDDAU API may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [18]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [19]) plays the role of the authorization server.

If OAuth2 is used, an NF Service Consumer, prior to consuming services offered by the Nudm\_NIDDAU API, shall obtain a "token" from the authorization server, by invoking the Access Token Request service, as described in 3GPP TS 29.510 [19], clause 5.4.2.2.

NOTE: When multiple NRFs are deployed in a network, the NRF used as authorization server is the same NRF that the NF Service Consumer used for discovering the Nudm\_NIDDAU service.

The Nudm\_NIDDAU API defines a single scope "nudm-niddau" for OAuth2 authorization (as specified in 3GPP TS 33.501 [6]) for the entire API, and it does not define any additional scopes at resource or operation level.

# 6.7 Nudm MT Service API

## 6.7.1 API URI

URIs of this API shall have the following root:

{apiRoot}/{apiName}/<apiVersion>/

The request URI used in HTTP request from the NF service consumer towards the NF service producer shall have the structure defined in clause 4.4.1 of 3GPP TS 29.501 [5], i.e.:

# $\{apiRoot\}/\!<\!apiName >\!/\!<\!apiVersion >\!/\!<\!apiSpecificResourceUriPart >\!$

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [5].
- The <apiName> shall be "nudm-mt".
- The <apiVersion> shall be "v1".
- The <apiSpecificResourceUriPart> shall be set as described in clause 6.7.3.

# 6.7.2 Usage of HTTP

## 6.7.2.1 General

HTTP/2, as defined in IETF RFC 7540 [13], shall be used as specified in clause 5 of 3GPP TS 29.500 [4].

HTTP/2 shall be transported as specified in clause 5.3 of 3GPP TS 29.500 [4].

HTTP messages and bodies for the Nudm\_MT service shall comply with the OpenAPI [14] specification contained in Annex A4.

#### 6.7.2.2 HTTP standard headers

#### 6.7.2.2.1 General

The usage of HTTP standard headers shall be supported as specified in clause 5.2.2 of 3GPP TS 29.500 [4].

## 6.7.2.2.2 Content type

The following content types shall be supported:

JSON, as defined in IETF RFC 8259 [15], signalled by the content type "application/json".

The Problem Details JSON Object (IETF RFC 7807 [16] signalled by the content type "application/problem+json"

#### 6.7.2.3 HTTP custom headers

#### 6.7.2.3.1 General

The usage of HTTP custom headers shall be supported as specified in clause 5.2.3 of 3GPP TS 29.500 [4].

## 6.7.3 Resources

#### 6.7.3.1 Overview

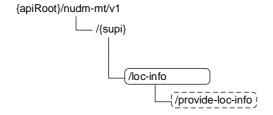


Figure 6.7.3.1-1: Resource URI structure of the nudm-mt API

Table 6.7.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.7.3.1-1: Resources and methods overview

Resource name (Archetype)	Resource URI	HTTP method or custom operation	Description
UeInfo (Document)	/{supi}	GET	Retrieve UE's TADS Info and/or User State and/or 5GSRVCCInfo
LocationInfo (Custom Operation)	/{supi}/loc-info/provide-loc-info	provide- loc-info (POST)	Request UE's location

#### 6.7.3.2 Resource: UeInfo

#### 6.7.3.2.1 Description

This resource represents the 5GC TADS Info and/or User State and/or 5GSRVCCInfo for a SUPI. It is queried by the HSS (see 3GPP TS 23.632 [32] clause 5.4.1.

#### 6.7.3.2.2 Resource Definition

Resource URI: {apiRoot}/nudm-mt/<apiVersion>/{supi}

This resource shall support the resource URI variables defined in table 6.7.3.2.2-1.

Table 6.7.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition			
apiRoot	string	See clause 6.7.1			
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2)			
		pattern: See pattern of type Supi in 3GPP TS 29.571 [7]			

#### 6.7.3.2.3 Resource Standard Methods

## 6.7.3.2.3.1 GET

This method shall support the URI query parameters specified in table 6.7.3.2.3.1-1.

Table 6.7.3.2.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	Р	Cardinality	Description
fields	array(string)	M		The " fields " query parameter contains the pointers of the attribute(s) to be retrieved. See attribute names of type Uelnfo.
supported- features	SupportedFeat ures	0	01	see 3GPP TS 29.500 [4] clause 6.6

This method shall support the request data structures specified in table 6.7.3.2.3.1-2 and the response data structures and response codes specified in table 6.7.3.2.3.1-3.

Table 6.7.3.2.3.1-2: Data structures supported by the GET Request Body on this resource

Data typ	e P	Cardinality	Description
n/a			

Table 6.7.3.2.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	Р	Cardinality	Response codes	Description		
UeInfo	М	1	200 OK	Upon success, a response body containing the UeInfo shall be returned.		
ProblemDetails	0	01	404 Not Found	The "cause" attribute may be used to convey the following application errors: - USER_NOT_FOUND - DATA_NOT_FOUND		
NOTE: In addition						

# 6.7.3.3 Resource: LocationInfo

## 6.7.3.3.1 Description

This resource represents the UE's location information in 5GC. See 3GPP TS 23.632 [32] clause 5.4.3.

#### 6.7.3.3.2 Resource Definition

Resource URI: {apiRoot}/nudm-mt/<apiVersion>/{supi}/loc-info

This resource shall support the resource URI variables defined in table 6.7.3.3.2-1.

Table 6.7.3.3.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.7.1
supi	Supi	Represents the Subscription Permanent Identifier (see 3GPP TS 23.501 [2] clause 5.9.2) pattern: "(imsi-[0-9]{5,15} nai+ .+)"

#### 6.7.3.3.3 Resource Standard Methods

No Standard Methods are supported for this resource.

## 6.7.3.3.4 Resource Custom Operations

#### 6.7.3.3.4.1 Overview

Table 6.7.3.3.4.1-1: Custom operations

Operation Name	Custom operation URI	Mapped HTTP method	Description
provide-loc-info	/provide-loc-info		Request UE location information in 5GC.

#### 6.7.3.3.4.2 Operation: provide-loc-info

# 6.7.3.3.4.2.1 Description

This custom operation is used by the NF service consumer (HSS) to request the UE location information in 5GC.

## 6.7.3.3.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.7.3.3.4.2.2-1 and the response data structure and response codes specified in table 6.7.3.3.4.2.2-2.

Table 6.7.3.3.4.2.2-1: Data structures supported by the POST Request Body on this resource

Data type	Р	Cardinality	Description
LocationInfoRequ est	M		Contains the requested information: current location, local time zone, RAT type, or serving node identity only

Table 6.7.3.3.4.2.2-2: Data structures supported by the POST Response Body on this resource

Data type	Р	Cardinality	Response	Description	
			codes		
LocationInfoRes	М	1	200 OK	Upon success, a response body containing requested	
ult			information shall be returned.		
ProblemDetails	0	01	404 Not	The "cause" attribute may be used to indicate the following	
			Found	application error:	
				- USER_NOT_FOUND	
			- DATA_NOT_FOUND		
NOTE: In addition, common data structures as listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] are supported.					

# 6.7.4 Custom Operations without associated resources

In this release of this specification, no custom operations without associated resources are defined for the Nudm\_MT Service.

# 6.7.5 Notifications

In this release of this specification, no notifications are defined for the Nudm\_MT Service.

## 6.7.6 Data Model

#### 6.7.6.1 General

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

Table 6.7.6.1-1 specifies the structured data types defined for the Nudm\_MT service API. For simple data types defined for the Nudm\_MT service API see table 6.7.6.3.2-1.

Table 6.7.6.1-1: Nudm\_MT specific Data Types

Data type	Clause defined	Description
UeInfo	6.7.6.2.2	
LocationInfoRequest	6.7.6.2.3	
LocationInfoResult	6.7.6.2.4	
5GSrvccInfo	6.7.6.2.5	

Table 6.7.6.1-2 specifies data types re-used by the Nudm\_MT service API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nudm\_MT service API.

Table 6.7.6.1-2: Nudm\_MT re-used Data Types

Data type	Reference	Comments
UeContextInfo	3GPP TS 29.518 [36]	
Supi	3GPP TS 29.571 [7]	
5GsUserState	3GPP TS 29.518 [36]	
NfInstanceId	3GPP TS 29.571 [7]	Network Function Instance Identifier
Plmnld	3GPP TS 29.571 [7]	PLMN Identity
Ecgi	3GPP TS 29.571 [7]	EUTRAN cell identity
Ncgi	3GPP TS 29.571 [7]	NR cell identity
Tai	3GPP TS 29.571 [7]	Tracking area identity
GeographicArea	3GPP TS 29.572 [34]	Estimate of the location of the UE
AgeOfLocationEstimate	3GPP TS 29.572 [34]	Age Of Location Estimate
RatType	3GPP TS 29.571 [7]	RAT type
TimeZone	3GPP TS 29.571 [7]	Time Zone
SupportedFeatures	3GPP TS 29.571 [7]	
ProblemDetails	3GPP TS 29.571 [7]	
StnSr	3GPP TS 29.571 [7]	Session Transfer Number for 5G-SRVCC
CMsisdn	3GPP TS 29.571 [7]	Correlation MSISDN

# 6.7.6.2 Structured data types

# 6.7.6.2.1 Introduction

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

6.7.6.2.2 Type: UeInfo

Table 6.7.6.2.2-1: Definition of type UeInfo

Attribute name	Data type	Р	Cardinality	Description
tadsInfo	UeContextInfo	0	01	See 3GPP TS 29.518 [36]
userState	5GsUserState	0	01	See 3GPP TS 29.518 [36]
5gSrvccInfo	5GSrvccInfo	0	01	

6.7.6.2.3 Type: LocationInfoRequest

Table 6.7.6.2.3-1: Definition of type LocationInfoRequest

Attribute name	Data type	Р	Cardinality	Description
req5gsLoc	boolean	С	01	This IE shall be present and set to "true", if 5GS location information is requested.  When present, the IE shall be set as following: - true: the location of the UE is requested - false (default): the location of the UE is not requested
reqCurrentLoc	boolean	С	01	This IE may be present if location information is requested.  When present, the IE shall be set as following:  - true: the current location of the UE is requested  - false (default): the current location of the UE is not requested
reqRatType	boolean	С	01	This IE shall be present and set to "true", if the RAT Type of the UE is requested.  When present, the IE shall be set as following:  - true: the RAT type of the UE is requested  - false (default): the RAT type of the UE is not requested
reqTimeZone	boolean	С	01	This IE shall be present and set to "true", if the local timezone of the UE is requested.  When present, the IE shall be set as following:  - true: the local timezone of the UE is requested  - false (default): the local timezone of the UE is not requested.
reqServingNode	boolean	С	01	This IE shall be present and set to "true", if only serving node(s) address/identity is requested as location information.  When present, the IE shall be set as following:  - true: only serving node(s) identity is requested  - false(default)
supportedFeatures	SupportedFeatures	0	01	See clause 6.7.8

6.7.6.2.4 Type: LocationInfoResult

Table 6.7.6.2.4-1: Definition of type LocationInfoResult

Attribute name	Data type	Р	Cardinality	Description	
vPlmnId	Plmnld	М	1	Visiting PLMN Identity	
amfInstanceId	NfInstanceId	0	01	NF instance ID of the serving AMF for 3GPP	
				access	
smsflnstanceld	NfInstanceId	0	01	NF instance ID of the serving SMSF	
ecgi	Ecgi	0	01	E-UTRA Cell Identity	
ncgi	Ncgi	0	01	NR Cell Identity	
tai	Tai	0	01	Tracking Area Identity	
currentLoc	boolean	0	01	When present, this IE shall be set as following:	
				<ul> <li>true: the current location of the UE is</li> </ul>	
				returned	
				<ul> <li>false: the last known location of the UE is</li> </ul>	
				returned.	
geoInfo	GeographicArea	0	01	If present, this IE shall contain the geographical	
				information of the UE.	
locationAge	AgeOfLocationEstim	0	01	If present, this IE shall contain the age of the	
	ate			location information.	
ratType	RatType	0	01	If present, this IE shall contain the current RAT	
				type of the UE.	
timezone	TimeZone	0	01	If present, this IE shall contain the local time	
				zone of the UE.	
supportedFeatures	SupportedFeatures	0	01	See clause 6.7.8	
NOTE: Either the "ecgi" attribute or the "ncgi" attribute may be included.					

# 6.7.6.2.5 Type: 5GSrvccInfo

Table 6.7.6.2.5-1: Definition of type 5GSrvccInfo

Attribute name	Data type	Р	Cardinality	Description
ue5GSrvccCapability	boolean	M	1	This IE indicates whether the UE supports 5G SRVCC: - true: 5G SRVCC is supported by the UE - false: 5G SRVCC is not supported.
stnSr	StnSr	0	01	Session Transfer Number for 5G-SRVCC
cMsisdn	CMsisdn	0	01	Correlation MSISDN of the UE.

# 6.7.6.3 Simple data types and enumerations

In this release of this specification, no simple data types and enumerations are defined for the Nudm\_MT Service.

# 6.7.7 Error Handling

#### 6.7.7.1 General

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

## 6.7.7.2 Protocol Errors

Protocol errors handling shall be supported as specified in clause 5.2.7 of 3GPP TS 29.500 [4].

# 6.7.7.3 Application Errors

The common application errors defined in the Table 5.2.7.2-1 in 3GPP TS 29.500 [4] may also be used for the Nudm\_MT service. The following application errors listed in Table 6.7.7.3-1 are specific for the Nudm\_MT service.

Table 6.7.7.3-1: Application errors

Application Error HTTP status		Description	
	code		
USER_NOT_FOUND	404 Not Found	The user does not exist	
DATA_NOT_FOUND	404 Not Found	The requested UE data is not found/does not exist.	

# 6.7.8 Feature Negotiation

The optional features in table 6.7.8-1 are defined for the Nudm\_MT API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

Table 6.7.8-1: Supported Features

Feature number	Feature Name	Description

# 6.7.9 Security

As indicated in 3GPP TS 33.501 [6] and 3GPP TS 29.500 [4], the access to the Nudm\_MT API may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [18]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [19]) plays the role of the authorization server.

If OAuth2 is used, an NF Service Consumer, prior to consuming services offered by the Nudm\_MT API, shall obtain a "token" from the authorization server, by invoking the Access Token Request service, as described in 3GPP TS 29.510 [19], clause 5.4.2.2.

NOTE: When multiple NRFs are deployed in a network, the NRF used as authorization server is the same NRF that the NF Service Consumer used for discovering the Nudm\_MT service.

The Nudm\_MT API defines a single scope "nudm-mt" for OAuth2 authorization (as specified in 3GPP TS 33.501 [6]) for the entire API, and it does not define any additional scopes at resource or operation level.

# Annex A (normative): OpenAPI specification

# A.1 General

This Annex specifies the formal definition of the Nudm Service API(s). It consists of OpenAPI 3.0.0 specifications, in YAML format.

This Annex takes precedence when being discrepant to other parts of the specification with respect to the encoding of information elements and methods within the API(s).

NOTE: The semantics and procedures, as well as conditions, e.g. for the applicability and allowed combinations of attributes or values, not expressed in the OpenAPI definitions but defined in other parts of the specification also apply.

Informative copies of the OpenAPI specification files contained in this 3GPP Technical Specification are available on a Git-based repository, that uses the GitLab software version control system (see 3GPP TS 29.501 [5] clause 5.3.1 and 3GPP TR 21.900 [30] clause 5B).

# A.2 Nudm\_SDM API

```
openapi: 3.0.0
info:
  version: '2.1.3'
  title: 'Nudm_SDM'
  description:
    Nudm Subscriber Data Management Service.
    © 2021, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
externalDocs:
  description: 3GPP TS 29.503 Unified Data Management Services, version 16.7.0
  url: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.503/'
  - url: '{apiRoot}/nudm-sdm/v2'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause clause 4.4 of 3GPP TS 29.501.
security:
  - oAuth2ClientCredentials:
    - nudm-sdm
paths:
  /{supi}:
      summary: retrieve multiple data sets
      operationId: GetDataSets
        - Retrieval of multiple data sets
      parameters:
        - name: supi
          in: path
          description: Identifier of the UE
          required: true
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi
        - name: dataset-names
          in: query
          style: form
          explode: false
          description: List of dataset names
          required: true
          schema:
             $ref: '#/components/schemas/DatasetNames'
```

```
- name: plmn-id
          in: query
          description: serving PLMN ID
          content:
            application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        - name: supported-features
          in: query
          description: Supported Features
          schema:
             $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: If-None-Match
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.2
          schema:
            type: string
        - name: If-Modified-Since
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.3
          schema:
            type: string
      responses:
        '200':
          description: Expected response to a valid request
          content:
            application/json:
              schema:
               $ref: '#/components/schemas/SubscriptionDataSets'
          headers:
            Cache-Control:
              description: Cache-Control containing max-age, as described in RFC 7234, 5.2
                type: string
            ETag:
              description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
              schema:
               type: string
            Last-Modified:
             description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
             schema:
               type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        5001:
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          $ref: 'TS29571 CommonData.vaml#/components/responses/503'
        default:
          description: Unexpected error
  /{supi}/nssai:
    get:
      summary: retrieve a UE's subscribed NSSAI
      operationId: GetNSSAI
        - Slice Selection Subscription Data Retrieval
      parameters:
        - name: supi
          in: path
         description: Identifier of the UE
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
          in: query
          description: Supported Features
          schema:
             $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: plmn-id
          in: query
          description: serving PLMN ID
          content:
            application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
```

```
- name: If-None-Match
          in: header
         description: Validator for conditional requests, as described in RFC 7232, 3.2
         schema:
           type: string
        - name: If-Modified-Since
          in: header
         description: Validator for conditional requests, as described in RFC 7232, 3.3
          schema:
           type: string
     responses:
        2001:
         description: Expected response to a valid request
          content:
           application/json:
             schema:
                $ref: '#/components/schemas/Nssai'
         headers:
           Cache-Control:
             description: Cache-Control containing max-age, as described in RFC 7234, 5.2
              schema:
               type: string
            ETag:
             description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
              schema:
               type: string
            Last-Modified:
             description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
             schema:
               type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
         $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
         $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
         $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
         description: Unexpected error
  /{supi}/ue-context-in-amf-data:
   get:
      summary: retrieve a UE's UE Context In AMF Data
      operationId: GetUeCtxInAmfData
      tags:
       - UE Context In AMF Data Retrieval
     parameters:
        - name: supi
         in: path
         description: Identifier of the UE
         required: true
         schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
         in: query
          description: Supported Features
             $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
     responses:
        '200':
         description: Expected response to a valid request
         content:
           application/ison:
             schema:
                $ref: '#/components/schemas/UeContextInAmfData'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
         $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
         $ref: 'TS29571_CommonData.yaml#/components/responses/500'
         $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
         description: Unexpected error
  /{supi}/am-data:
   get:
```

```
summary: retrieve a UE's Access and Mobility Subscription Data
      operationId: GetAmData
      tags:
        - Access and Mobility Subscription Data Retrieval
      parameters:
        - name: supi
          in: path
          description: Identifier of the UE
          required: true
           $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
          in: query
          description: Supported Features
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: plmn-id
          in: query
          description: serving PLMN ID
          content:
           application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        - name: If-None-Match
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.2
          schema:
           type: string
        - name: If-Modified-Since
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.3
          schema:
           type: string
      responses:
        '200':
          description: Expected response to a valid request
          content:
            application/ison:
              schema:
                $ref: '#/components/schemas/AccessAndMobilitySubscriptionData'
           Cache-Control:
              description: Cache-Control containing max-age, as described in RFC 7234, 5.2
              schema:
               type: string
            ETag:
              description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
              schema:
                type: string
            Last-Modified:
              description: Timestamp for last modification of the resource, as described in RFC
7232. 2.2
              schema:
               type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{supi}/am-data/ecr-data:
    get:
      summary: retrieve a UE's subscribed Enhanced Coverage Restriction Data
      operationId: GetEcrData
      tags:
        - Enhanced Coverage Restriction Data Retrieval
      parameters:
        - name: supi
         in: path
          description: Identifier of the UE
          required: true
           $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
```

```
in: query
          description: Supported Features
          schema:
             $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: If-None-Match
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.2
          schema:
            type: string
        - name: If-Modified-Since
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.3
          schema:
           type: string
      responses:
        '200':
          description: Expected response to a valid request
          content:
            application/json:
              schema:
               $ref: '#/components/schemas/EnhancedCoverageRestrictionData'
          headers:
            Cache-Control:
              description: Cache-Control containing max-age, as described in RFC 7234, 5.2
              schema:
               type: string
              description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
              schema:
                type: string
            Last-Modified:
              description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
              schema:
               type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{supi}/smf-select-data:
    aet:
      summary: retrieve a UE's SMF Selection Subscription Data
      operationId: GetSmfSelData
      tags:
        - SMF Selection Subscription Data Retrieval
      parameters:
        - name: supi
          in: path
         description: Identifier of the UE
          required: true
          schema:
           $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
          in: querv
          description: Supported Features
          schema:
            $ref: 'TS29571_CommonData.yam1#/components/schemas/SupportedFeatures'
        - name: plmn-id
          in: query
          description: serving PLMN ID
          content:
           application/json:
              schema:
                \verb| $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'| \\
        - name: If-None-Match
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.2
          schema:
           type: string
        - name: If-Modified-Since
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.3
```

```
schema:
           type: string
      responses:
        '200':
          description: Expected response to a valid request
            application/json:
              schema:
                $ref: '#/components/schemas/SmfSelectionSubscriptionData'
          headers:
            Cache-Control:
              description: Cache-Control containing max-age, as described in RFC 7234, 5.2
              schema:
               type: string
            ETag:
             description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
              schema:
                type: string
            Last-Modified:
             description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
              schema:
               type: string
        '400':
          $ref: 'TS29571 CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        503:
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{supi}/ue-context-in-smf-data:
    get:
      summary: retrieve a UE's UE Context In SMF Data
      operationId: GetUeCtxInSmfData
      tags:
       - UE Context In SMF Data Retrieval
      parameters:
        - name: supi
         in: path
          description: Identifier of the UE
          required: true
           $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
          in: query
          description: Supported Features
            $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
      responses:
        '200':
          description: Expected response to a valid request
          content:
           application/json:
             schema:
                $ref: '#/components/schemas/UeContextInSmfData'
        '400':
          $ref: 'TS29571 CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        503:
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{supi}/ue-context-in-smsf-data:
    get:
      summary: retrieve a UE's UE Context In SMSF Data
      operationId: GetUeCtxInSmsfData
      tags:
        - UE Context In SMSF Data Retrieval
      parameters:
        - name: supi
          in: path
          description: Identifier of the UE
```

```
required: true
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      - name: supported-features
       in: query
       description: Supported Features
       schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
   responses:
      '200':
       description: Expected response to a valid request
       content:
         application/json:
           schema:
             $ref: '#/components/schemas/UeContextInSmsfData'
       $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '404':
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      '500':
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
     default:
       description: Unexpected error
/{supi}/trace-data:
   summary: retrieve a UE's Trace Configuration Data
   operationId: GetTraceConfigData
   tags:
     - Trace Configuration Data Retrieval
   parameters:
      - name: supi
       in: path
       description: Identifier of the UE
       required: true
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      - name: supported-features
       in: query
       description: Supported Features
       schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
      - name: plmn-id
       in: query
       description: serving PLMN ID
       content:
         application/json:
           schema:
             $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      - name: If-None-Match
       in: header
       description: Validator for conditional requests, as described in RFC 7232, 3.2
       schema:
         type: string
      - name: If-Modified-Since
       in: header
       description: Validator for conditional requests, as described in RFC 7232, 3.3
       schema:
         type: string
   responses:
      '200':
       description: Expected response to a valid request
       content:
         application/json:
           schema:
             $ref: '#/components/schemas/TraceDataResponse'
       headers:
         Cache-Control:
           description: Cache-Control containing max-age, as described in RFC 7234, 5.2
           schema:
             type: string
         ETag:
           description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
             type: string
         Last-Modified:
```

```
description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
              schema:
                type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{supi}/sm-data:
   get:
      summary: retrieve a UE's Session Management Subscription Data
      operationId: GetSmData
        - Session Management Subscription Data Retrieval
      parameters:
        - name: supi
          in: path
         description: Identifier of the UE
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
          in: query
          description: Supported Features
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: single-nssai
          in: query
          content:
            application/json:
             schema:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
        - name: dnn
          in: query
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
        - name: plmn-id
          in: query
          content:
           application/json:
              schema:
               $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        - name: If-None-Match
         in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.2
          schema:
            type: string
        - name: If-Modified-Since
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.3
          schema:
           type: string
      responses:
        '200':
          description: Expected response to a valid request
          content:
            application/json:
              schema:
                type: array
                items:
                  $ref: '#/components/schemas/SessionManagementSubscriptionData'
               minItems: 1
          headers:
            Cache-Control:
              description: Cache-Control containing max-age, as described in RFC 7234, 5.2
              schema:
               type: string
            ETag:
              description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
               type: string
            Last-Modified:
```

```
description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
              schema:
                type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
         $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        500:
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
         $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
         description: Unexpected error
  /{supi}/sms-data:
   get:
      summary: retrieve a UE's SMS Subscription Data
      operationId: GetSmsData
        - SMS Subscription Data Retrieval
      parameters:
        - name: supi
          in: path
         description: Identifier of the UE
         required: true
         schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
         in: query
         description: Supported Features
         schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: plmn-id
         in: query
         content:
           application/json:
             schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        - name: If-None-Match
         in: header
         description: Validator for conditional requests, as described in RFC 7232, 3.2
         schema:
           type: string
        - name: If-Modified-Since
         in: header
         description: Validator for conditional requests, as described in RFC 7232, 3.3
         schema:
            type: string
      responses:
        '200':
         description: Expected response to a valid request
         content:
            application/json:
              schema:
               $ref: '#/components/schemas/SmsSubscriptionData'
         headers:
            Cache-Control:
              description: Cache-Control containing max-age, as described in RFC 7234, 5.2
               type: string
            ETaq:
              description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
              schema:
                type: string
            Last-Modified:
             description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
              schema:
                type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
         $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        500:
         $ref: 'TS29571_CommonData.yaml#/components/responses/500'
         $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
```

```
description: Unexpected error
  /{supi}/sms-mng-data:
    get:
      summary: retrieve a UE's SMS Management Subscription Data
      operationId: GetSmsMngtData
      tags:
        - SMS Management Subscription Data Retrieval
      parameters:
        - name: supi
          in: path
         description: Identifier of the UE
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
          in: query
          description: Supported Features
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: plmn-id
          in: query
          content:
            application/json:
              schema:
                $ref: 'TS29571 CommonData.yaml#/components/schemas/PlmnId'
        - name: If-None-Match
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.2
          schema:
            type: string
        - name: If-Modified-Since
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.3
          schema:
           type: string
      responses:
        '200':
          description: Expected response to a valid request
          content:
            application/json:
              schema:
               $ref: '#/components/schemas/SmsManagementSubscriptionData'
          headers:
            Cache-Control:
              description: Cache-Control containing max-age, as described in RFC 7234, 5.2
              schema:
               type: string
            ETag:
              description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
              schema:
               type: string
            Last-Modified:
              description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
             schema:
               type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
          $ref: 'TS29571 CommonData.yaml#/components/responses/404'
        500:
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{ueId}/lcs-privacy-data:
    get:
      summary: retrieve a UE's LCS Privacy Subscription Data
      operationId: GetLcsPrivacyData
         - LCS Privacy Data Retrieval
      parameters:
        - name: ueId
          in: path
          description: Identifier of the UE
          required: true
          schema:
```

```
$ref: 'TS29571_CommonData.yaml#/components/schemas/VarUeId'
        - name: supported-features
          in: query
          description: Supported Features
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: If-None-Match
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.2
           type: string
        - name: If-Modified-Since
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.3
          schema:
           type: string
      responses:
        '200':
          description: Expected response to a valid request
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/LcsPrivacyData'
            Cache-Control:
              description: Cache-Control containing max-age, as described in RFC 7234, 5.2
              schema:
               type: string
            ETag:
              description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
              schema:
               type: string
            Last-Modified:
              description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
               type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{supi}/lcs-mo-data:
      summary: retrieve a UE's LCS Mobile Originated Subscription Data
      operationId: GetLcsMoData
        - LCS Mobile Originated Data Retrieval
      parameters:
        - name: supi
          in: path
          description: Identifier of the UE
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
          in: query
          description: Supported Features
          schema:
             $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: If-None-Match
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.2
          schema:
            type: string
        - name: If-Modified-Since
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.3
          schema:
           type: string
      responses:
        '200':
```

```
description: Expected response to a valid request
            application/json:
              schema:
                $ref: '#/components/schemas/LcsMoData'
            Cache-Control:
              description: Cache-Control containing max-age, as described in RFC 7234, 5.2
              schema:
               type: string
              description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
              schema:
               type: string
            Last-Modified:
             description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
              schema:
               type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          $ref: 'TS29571 CommonData.yaml#/components/responses/500'
        15031:
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
          description: Unexpected error
  /{supi}/lcs-bca-data:
    get:
      summary: retrieve a UE's LCS Broadcast Assistance Data Types Subscription Data
      operationId: GetLcsBcaData
      tags:
        - LCS Broadcast Assistance Data Types Retrieval
      parameters:
        - name: supi
          in: path
          description: Identifier of the UE
          required: true
          schema:
           $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
          in: query
          description: Supported Features
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: plmn-id
          in: query
          content:
           application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        - name: If-None-Match
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.2
          schema:
           type: string
        - name: If-Modified-Since
          in: header
          description: Validator for conditional requests, as described in RFC 7232, 3.3
          schema:
           type: string
      responses:
        '200':
          description: Expected response to a valid request
          content:
           application/json:
              schema:
                $ref: '#/components/schemas/LcsBroadcastAssistanceTypesData'
            Cache-Control:
             description: Cache-Control containing max-age, as described in RFC 7234, 5.2
              schema:
                type: string
              description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
              schema:
```

```
type: string
            Last-Modified:
             description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
             schema:
               type: string
        '400':
         $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
         $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        15031:
         $ref: 'TS29571_CommonData.yaml#/components/responses/503'
         description: Unexpected error
  /{supi}/v2x-data:
      summary: retrieve a UE's V2X Subscription Data
      operationId: GetV2xData
        - V2X Subscription Data Retrieval
      parameters:
        - name: supi
         in: path
         description: Identifier of the UE
         required: true
         schema:
           $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
         in: query
         description: Supported Features
         schema:
             $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: If-None-Match
         in: header
         description: Validator for conditional requests, as described in RFC 7232, 3.2
         schema:
           type: string
        - name: If-Modified-Since
         in: header
         description: Validator for conditional requests, as described in RFC 7232, 3.3
         schema:
           type: string
      responses:
        '200':
         description: Expected response to a valid request
          content:
           application/json:
             schema:
               $ref: '#/components/schemas/V2xSubscriptionData'
         headers:
            Cache-Control:
             description: Cache-Control containing max-age, as described in RFC 7234, 5.2
             schema:
                type: string
            ETag:
              description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
             schema:
                type: string
            Last-Modified:
             description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
             schema:
               type: string
        '400':
         $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
         $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
         description: Unexpected error
  /{ueId}/sdm-subscriptions:
```

```
post:
      summary: subscribe to notifications
      operationId: Subscribe
      tags:
        - Subscription Creation
      parameters:
        - name: ueId
          in: path
          description: Identity of the user
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/VarUeId'
      requestBody:
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/SdmSubscription'
       required: true
      responses:
        '201':
          description: Expected response to a valid request
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/SdmSubscription'
          headers:
            Location:
              description: 'Contains the URI of the newly created resource, according to the
structure: {apiRoot}/nudm-sdm/<apiVersion>/{supi}/sdm-subscriptions/{subscriptionId}
              required: true
              schema:
                type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          $ref: 'TS29571 CommonData.vaml#/components/responses/500'
        501:
          $ref: 'TS29571_CommonData.yaml#/components/responses/501'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
      callbacks:
        datachangeNotification:
           '{request.body#/callbackReference}':
            post:
              requestBody:
               required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/ModificationNotification'
              responses:
                '204':
                  description: Successful Notification response
                  description: Temporary Redirect
                  content:
                    application/problem+json:
                      schema:
                       $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. AMF) to which the request is redirected'
                      required: true
                      schema:
                        type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                      schema:
                        type: string
                '308':
                  description: Permanent Redirect
                  content:
```

```
application/problem+json:
                      schema:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. AMF) to which the request is redirected'
                      required: true
                      schema:
                       type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                      schema:
                       type: string
                '400':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/400'
                '404':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/404'
                '500':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/500'
                '503':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/503'
                default:
                  description: Unexpected error
  /{ueId}/sdm-subscriptions/{subscriptionId}:
    delete:
      summary: unsubscribe from notifications
      operationId: Unsubscribe
      tags:
       - Subscription Deletion
      parameters:
        - name: ueId
          in: path
          description: Identity of the user
          required: true
         schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/VarUeId'
        - name: subscriptionId
          in: path
          description: Id of the SDM Subscription
          required: true
          schema:
            type: string
      responses:
        '204':
          description: Successful response
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        5001:
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        15031:
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
    patch:
      summary: modify the subscription
      operationId: Modify
      tags:
        - Subscription Modification
      parameters:
        - name: ueId
         in: path
          description: Identity of the user
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/VarUeId'
        - name: subscriptionId
          in: path
          description: Id of the SDM Subscription
         required: true
          schema:
           type: string
        - name: supported-features
          in: query
          description: Features required to be supported by the target NF
```

```
$ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
   requestBody:
      content:
       application/merge-patch+json:
            $ref: '#/components/schemas/SdmSubsModification'
     required: true
    responses:
      '200':
       description: Expected response to a valid request
       content:
         application/json:
           schema:
             oneOf:
               - $ref: '#/components/schemas/SdmSubscription'
                - $ref: 'TS29571_CommonData.yaml#/components/schemas/PatchResult'
      14001:
       $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
       $ref: 'TS29571 CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29571_CommonData.yaml#/components/responses/404'
       $ref: 'TS29571 CommonData.yaml#/components/responses/500'
      '503':
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
       description: Unexpected error
/{ueId}/id-translation-result:
 get:
   summary: retrieve a UE's SUPI or GPSI
   operationId: GetSupiOrGpsi
   tags:
      - GPSI to SUPI Translation
   parameters:
     - name: ueId
       in: path
       description: Identifier of the UE
       required: true
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/VarUeId'
      - name: supported-features
       in: query
       description: Supported Features
       schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
      - name: app-port-id
        in: query
       description: Application port identifier
       content:
         application/json:
            schema:
              $ref: '#/components/schemas/AppPortId'
      - name: If-None-Match
       in: header
       description: Validator for conditional requests, as described in RFC 7232, 3.2
         type: string
      - name: If-Modified-Since
       in: header
       description: Validator for conditional requests, as described in RFC 7232, 3.3
       schema:
         type: string
   responses:
      '200':
       description: Expected response to a valid request
       content:
         application/json:
           schema:
              $ref: '#/components/schemas/IdTranslationResult'
       headers:
         Cache-Control:
           description: Cache-Control containing max-age, as described in RFC 7234, 5.2
            schema:
             type: string
          ETag:
            description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
```

```
schema:
                type: string
            Last-Modified:
              description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
              schema:
               type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{supi}/am-data/sor-ack:
   put:
      summary: Nudm_Sdm Info service operation
      operationId: SorAckInfo
        - Providing acknowledgement of Steering of Roaming
      parameters:
        - name: supi
         in: path
          description: Identifier of the UE
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      requestBody:
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/AcknowledgeInfo'
      responses:
          description: Successful acknowledgement
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        503:
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{supi}/am-data/upu-ack:
   put:
      summary: Nudm_Sdm Info for UPU service operation
      operationId: UpuAck
      tags:
       - Providing acknowledgement of UE Parameters Update
      parameters:
        - name: supi
         in: path
          description: Identifier of the UE
          required: true
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      request.Body:
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/AcknowledgeInfo'
      responses:
        '204':
          description: Successful acknowledgement
          $ref: 'TS29571 CommonData.yaml#/components/responses/400'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{supi}/am-data/subscribed-snssais-ack:
    put:
      summary: Nudm_Sdm Info operation for S-NSSAIs acknowledgement
```

```
operationId: S-NSSAIs Ack
    tags:
     - Providing acknowledgement of S-NSSAIs Update
    parameters:
      - name: supi
       in: path
       description: Identifier of the UE
       required: true
        schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
   requestBody:
      content:
       application/json:
         schema:
           $ref: '#/components/schemas/AcknowledgeInfo'
   responses:
      '204':
       description: Successful acknowledgement
      '400':
       $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '500':
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      503:
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
     default:
       description: Unexpected error
/{supi}/am-data/cag-ack:
   summary: Nudm_Sdm Info operation for CAG acknowledgement
    operationId: CAG Ack
    tags:
     - Providing acknowledgement of CAG Update
   parameters:
      - name: supi
       in: path
       description: Identifier of the UE
       required: true
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
    requestBody:
     content:
       application/json:
          schema:
            $ref: '#/components/schemas/AcknowledgeInfo'
    responses:
      '204':
       description: Successful acknowledgement
      '400':
        $ref: 'TS29571_CommonData.yaml#/components/responses/400'
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
       description: Unexpected error
/\{supi\}/am-data/update-sor:
 post:
    summary: Nudm_Sdm custom operation to trigger SOR info update
    operationId: Update SOR Info
    tags:
      - Trigger SOR info update
   parameters:
      - name: supi
       in: path
       description: Identifier of the UE
       required: true
        schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
    requestBody:
      content:
        application/json:
         schema:
           $ref: '#/components/schemas/SorUpdateInfo'
    responses:
      '200':
       description: Expected response to a valid request
       content:
          application/json:
```

```
schema:
                $ref: '#/components/schemas/SorInfo'
         $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
         $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
         description: Unexpected error
  /shared-data:
   get:
     summary: retrieve shared data
     operationId: GetSharedData
      tags:
        - Retrieval of shared data
     parameters:
        - name: shared-data-ids
         in: query
         description: List of shared data ids
         required: true
         style: form
         explode: false
         schema:
            $ref: '#/components/schemas/SharedDataIds'
        - name: supportedFeatures
         in: query
         description: Supported Features
         schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: If-None-Match
         in: header
         description: Validator for conditional requests, as described in RFC 7232, 3.2
         schema:
           type: string
        - name: If-Modified-Since
         in: header
         description: Validator for conditional requests, as described in RFC 7232, 3.3
           type: string
      responses:
        '200':
         description: Expected response to a valid request
         content:
           application/json:
              schema:
                type: array
                  $ref: '#/components/schemas/SharedData'
               minItems: 1
         headers:
            Cache-Control:
              description: Cache-Control containing max-age, as described in RFC 7234, 5.2
              schema:
               type: string
            ETag:
              description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
              schema:
               type: string
            Last-Modified:
             description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
             schema:
               type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
         $ref: 'TS29571_CommonData.yaml#/components/responses/503'
       default:
         description: Unexpected error
  /shared-data-subscriptions:
   post:
```

```
summary: subscribe to notifications for shared data
      operationId: SubscribeToSharedData
      tags:
        - Subscription Creation for shared data
      requestBody:
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/SdmSubscription'
        required: true
      responses:
         201':
          description: Expected response to a valid request
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/SdmSubscription'
          headers:
            Location:
              description: 'Contains the URI of the newly created resource, according to the
structure: \\ \{apiRoot\}/nudm-sdm/<apiVersion>/shared-data-subscriptions/\\ \{subscriptionId\} \\
              required: true
              schema:
                type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        default:
          description: Unexpected error
      callbacks:
        datachangeNotification:
           '{request.body#/callbackReference}':
            post:
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/ModificationNotification'
              responses:
                 '204':
                  description: Successful Notification response
                '307':
                  description: Temporary Redirect
                  content:
                    application/problem+json:
                      schema:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. AMF) to which the request is redirected'
                      required: true
                      schema:
                        type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                      schema:
                        type: string
                '308':
                  description: Permanent Redirect
                  content:
                    application/problem+json:
                      schema:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. AMF) to which the request is redirected'
                      required: true
                      schema:
                        type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                      schema:
```

```
type: string
              '400':
               $ref: 'TS29571_CommonData.yaml#/components/responses/400'
              '404':
                $ref: 'TS29571_CommonData.yaml#/components/responses/404'
              500:
               $ref: 'TS29571_CommonData.yaml#/components/responses/500'
              503:
                $ref: 'TS29571_CommonData.yaml#/components/responses/503'
              default:
               description: Unexpected error
/shared-data-subscriptions/{subscriptionId}:
 delete:
   summary: unsubscribe from notifications for shared data
   operationId: UnsubscribeForSharedData
   tags:
     - Subscription Deletion for shared data
   parameters:
     - name: subscriptionId
       in: path
       description: Id of the Shared data Subscription
       required: true
       schema:
         type: string
   responses:
      '204':
       description: Successful response
      '400':
       $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '404':
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
     default:
       description: Unexpected error
 patch:
   summary: modify the subscription
   operationId: ModifySharedDataSubs
   tags:
     - Subscription Modification
   parameters:
      - name: subscriptionId
       in: path
       description: Id of the SDM Subscription
       required: true
       schema:
         type: string
     - name: supported-features
       in: query
       description: Features required to be supported by the target NF
         $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
   requestBody:
     content:
       application/merge-patch+json:
         schema:
           $ref: '#/components/schemas/SdmSubsModification'
     required: true
   responses:
      '200':
       description: Expected response to a valid request
       content:
         application/json:
           schema:
             oneOf:
               - - $ref: '#/components/schemas/SdmSubscription'
                - $ref: 'TS29571_CommonData.yaml#/components/schemas/PatchResult'
      '400':
       $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
       $ref: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
```

```
$ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
         description: Unexpected error
  /group-data/group-identifiers:
     summary: Mapping of Group Identifiers
     operationId: GetGroupIdentifiers
      tags:
        - Group Identifiers
     parameters:
        - name: ext-group-id
         in: query
         description: External Group Identifier
         required: false
         schema:
            $ref: '#/components/schemas/ExtGroupId'
        - name: int-group-id
         in: query
         description: Internal Group Identifier
         required: false
         schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
        - name: ue-id-ind
         in: querv
         description: Indication whether UE identifiers are required or not
         required: false
         schema:
           type: boolean
            default: false
        - name: supported-features
         in: query
         description: Supported Features
         schema:
            \verb| $ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'| \\
        - name: If-None-Match
         in: header
         description: Validator for conditional requests, as described in RFC 7232, 3.2
         schema:
           type: string
        - name: If-Modified-Since
         in: header
         description: Validator for conditional requests, as described in RFC 7232, 3.3
          schema:
           type: string
      responses:
        200':
         description: Expected response to a valid request
          content:
           application/json:
              schema:
               $ref: '#/components/schemas/GroupIdentifiers'
         headers:
            Cache-Control:
             description: Cache-Control containing max-age, as described in RFC 7234, 5.2
              schema:
                type: string
              description: Entity Tag, containing a strong validator, as described in RFC 7232, 2.3
              schema:
                type: string
            Last-Modified:
             description: Timestamp for last modification of the resource, as described in RFC
7232, 2.2
             schema:
                type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
         $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
         description: Unexpected error
components:
```

```
securitySchemes:
    oAuth2ClientCredentials:
     type: oauth2
     flows:
        clientCredentials:
         tokenUrl: '{nrfApiRoot}/oauth2/token'
         scopes:
            nudm-sdm: Access to the nudm-sdm API
  schemas:
# COMPLEX TYPES:
   DatasetNames:
     type: array
      items:
        $ref: '#/components/schemas/DataSetName'
     minItems: 2
     uniqueItems: true
    SubscriptionDataSets:
      type: object
      properties:
       amData:
         $ref: '#/components/schemas/AccessAndMobilitySubscriptionData'
        smfSelData:
         $ref: '#/components/schemas/SmfSelectionSubscriptionData'
        uecAmfData:
         $ref: '#/components/schemas/UeContextInAmfData'
        uecSmfData:
         $ref: '#/components/schemas/UeContextInSmfData'
        uecSmsfData:
         $ref: '#/components/schemas/UeContextInSmsfData'
        smsSubsData:
         $ref: '#/components/schemas/SmsSubscriptionData'
        smData:
         type: array
          items:
            \verb| $ref: '\#/components/schemas/SessionManagementSubscriptionData'| \\
         minItems: 1
        traceData:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/TraceData'
        smsMngData:
          $ref: '#/components/schemas/SmsManagementSubscriptionData'
        lcsPrivacyData:
         $ref: '#/components/schemas/LcsPrivacyData'
        lcsMoData:
         $ref: '#/components/schemas/LcsMoData'
        v2xData:
         $ref: '#/components/schemas/V2xSubscriptionData'
        lcsBroadcastAssistanceTypesData:
          $ref: '#/components/schemas/LcsBroadcastAssistanceTypesData'
    UeContextInSmsfData:
      type: object
     properties:
        smsfInfo3GppAccess:
         $ref: '#/components/schemas/SmsfInfo'
        smsfInfoNon3GppAccess:
         $ref: '#/components/schemas/SmsfInfo'
    SmsfInfo:
     type: object
      required:
        - smsfInstanceId
        - plmnId
     properties:
        smsfInstanceId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        plmnId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    AccessAndMobilitySubscriptionData:
      type: object
      properties:
        supportedFeatures:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        gpsis:
```

```
type: array
  items:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
internalGroupIds:
  type: array
  items:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
 minItems: 1
sharedVnGroupDataIds:
 type: object
 additionalProperties:
    $ref: '#/components/schemas/SharedDataId'
 minProperties: 1
subscribedUeAmbr:
 $ref: 'TS29571_CommonData.yaml#/components/schemas/AmbrRm'
nssai:
 $ref: '#/components/schemas/Nssai'
ratRestrictions:
 type: array
 items:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
forbiddenAreas:
  type: array
 items:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/Area'
serviceAreaRestriction:
 $ref: 'TS29571_CommonData.yaml#/components/schemas/ServiceAreaRestriction'
coreNetworkTypeRestrictions:
 type: array
 items:
   $ref: 'TS29571_CommonData.yaml#/components/schemas/CoreNetworkType'
rfspIndex:
  $ref: 'TS29571_CommonData.yaml#/components/schemas/RfspIndexRm'
subsRegTimer:
 $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSecRm'
ueUsageType:
 $ref: '#/components/schemas/UeUsageType'
mpsPriority:
 $ref: '#/components/schemas/MpsPriorityIndicator'
mcsPriority:
 $ref: '#/components/schemas/McsPriorityIndicator'
activeTime:
 $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSecRm'
sorInfo:
 $ref: '#/components/schemas/SorInfo'
sorInfoExpectInd:
 type: boolean
sorafRetrieval:
  type: boolean
 default: false
sorUpdateIndicatorList:
  type: array
  items:
    $ref: '#/components/schemas/SorUpdateIndicator'
 minItems: 1
upuInfo:
 $ref: '#/components/schemas/UpuInfo'
micoAllowed:
  $ref: '#/components/schemas/MicoAllowed'
sharedAmDataIds:
  type: array
  items:
   $ref: '#/components/schemas/SharedDataId'
 minItems: 1
odbPacketServices:
 $ref: 'TS29571_CommonData.yaml#/components/schemas/OdbPacketServices'
subscribedDnnList:
 type: array
  items:
    anyOf:
      - - $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
      - - $ref: 'TS29571_CommonData.yaml#/components/schemas/WildcardDnn'
serviceGapTime:
 $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
mdtUserConsent:
 $ref: '#/components/schemas/MdtUserConsent'
mdtConfiguration:
  $ref: 'TS29571_CommonData.yaml#/components/schemas/MdtConfiguration'
```

```
traceData:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/TraceData'
    caqData:
     $ref: '#/components/schemas/CagData'
    stnSr:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/StnSr'
    cMsisdn:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/CMsisdn'
    nbIoTUePriority:
     $ref: '#/components/schemas/NbIoTUePriority'
    nssaiInclusionAllowed:
     type: boolean
     default: false
    rgWirelineCharacteristics:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/RgWirelineCharacteristics'
    ecRestrictionDataWb:
     $ref: '#/components/schemas/EcRestrictionDataWb'
    ecRestrictionDataNb:
     type: boolean
     default: false
    expectedUeBehaviourList:
      $ref: '#/components/schemas/ExpectedUeBehaviourData'
    primaryRatRestrictions:
      type: array
      items:
       $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
    secondaryRatRestrictions:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
    edrxParametersList:
     type: array
      items:
        $ref: '#/components/schemas/EdrxParameters'
     minItems: 1
   ptwParametersList:
     type: array
      items:
        $ref: '#/components/schemas/PtwParameters'
     minItems: 1
    iabOperationAllowed:
     type: boolean
     default: false
    wirelineForbiddenAreas:
     type: array
      items:
       $ref: 'TS29571_CommonData.yaml#/components/schemas/WirelineArea'
    wirelineServiceAreaRestriction:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/WirelineServiceAreaRestriction'
CaqData:
  type: object
  required:
    - cagInfos
 properties:
   cagInfos:
     description: A map (list of key-value pairs where PlmnId serves as key) of CagInfo
      type: object
     additionalProperties:
       $ref: '#/components/schemas/CagInfo'
   provisioningTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
CaqInfo:
  type: object
  required:
     - allowedCagList
 properties:
    allowedCaqList:
      type: array
      items:
       $ref: 'TS29571_CommonData.yaml#/components/schemas/CagId'
   cagOnlyIndicator:
     type: boolean
SmfSelectionSubscriptionData:
  type: object
  properties:
```

```
supportedFeatures:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    subscribedSnssaiInfos:
      type: object
      additionalProperties:
        $ref: '#/components/schemas/SnssaiInfo'
    sharedSnssaiInfosId:
      $ref: '#/components/schemas/SharedDataId'
SnssaiInfo:
  type: object
  required:
    - dnnInfos
  properties:
    dnnInfos:
      type: array
      items:
        $ref: '#/components/schemas/DnnInfo'
DnnInfo:
  type: object
  required:
   - dnn
 properties:
    dnn:
        - - $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
        - $ref: 'TS29571_CommonData.yaml#/components/schemas/WildcardDnn'
    defaultDnnIndicator:
      $ref: '#/components/schemas/DnnIndicator'
    lboRoamingAllowed:
      $ref: '#/components/schemas/LboRoamingAllowed'
    iwkEpsInd:
      $ref: '#/components/schemas/IwkEpsInd'
    dnnBarred:
     type: boolean
    invokeNefInd:
     type: boolean
    smfList:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
      minItems: 1
    sameSmfInd:
      type: boolean
Nssai:
  type: object
  required:
   - defaultSingleNssais
  properties:
    supportedFeatures:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    defaultSingleNssais:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
      minItems: 1
    singleNssais:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
      minItems: 1
    provisioningTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    additionalSnssaiData:
      type: object
      additionalProperties:
        $ref: '#/components/schemas/AdditionalSnssaiData'
      minProperties: 1
  nullable: true
UeContextInAmfData:
  type: object
  properties:
    epsInterworkingInfo:
      $ref: 'TS29503_Nudm_UECM.yaml#/components/schemas/EpsInterworkingInfo'
```

```
UeContextInSmfData:
      type: object
      properties:
        pduSessions:
         description: A map (list of key-value pairs where PduSessionId serves as key) of
PduSessions
          type: object
          additionalProperties:
            $ref: '#/components/schemas/PduSession'
        pgwInfo:
          type: array
          items:
            $ref: '#/components/schemas/PgwInfo'
          minItems: 1
        emergencyInfo:
          $ref: '#/components/schemas/EmergencyInfo'
    EmergencyInfo:
      type: object
      oneOf:
        - required:
          - pgwFqdn
        - required:
          - pgwIpAddress
      properties:
        pgwFqdn:
         type: string
        pgwIpAddress:
          $ref: '#/components/schemas/IpAddress'
        smfInstanceId:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        epdgInd:
          type: boolean
          default: false
    PduSession:
      type: object
      required:
        - dnn
        - smfInstanceId
        - plmnId
      properties:
        dnn:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
        smfInstanceId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        plmnId:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        singleNssai:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
    PgwInfo:
      type: object
      required:
         - dnn
        - pgwFqdn
      properties:
        dnn:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
        pgwFqdn:
         type: string
        plmnId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        epdgInd:
          type: boolean
          default: false
    SessionManagementSubscriptionData:
      type: object
      required:
        - singleNssai
      properties:
        singleNssai:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
        dnnConfigurations:
```

```
description: A map (list of key-value pairs where Dnn, or optionally the Wildcard DNN,
serves as key) of DnnConfigurations
          type: object
          additionalProperties:
            $ref: '#/components/schemas/DnnConfiguration'
        internalGroupIds:
          type: array
          items:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
          minItems: 1
        sharedVnGroupDataIds:
          type: object
          additionalProperties:
            $ref: '#/components/schemas/SharedDataId'
          minProperties: 1
        sharedDnnConfigurationsId:
          $ref: '#/components/schemas/SharedDataId'
        odbPacketServices:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/OdbPacketServices'
        traceData:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/TraceData'
        sharedTraceDataId:
          $ref: '#/components/schemas/SharedDataId'
        expectedUeBehavioursList:
          type: object
          additionalProperties:
            $ref: '#/components/schemas/ExpectedUeBehaviourData'
          minProperties: 1
        suggestedPacketNumDlList:
          type: object
          additionalProperties:
            $ref: '#/components/schemas/SuggestedPacketNumDl'
          minProperties: 1
        3qppCharqinqCharacteristics:
          $ref: '#/components/schemas/3GppChargingCharacteristics'
    DnnConfiguration:
      type: object
      required:
        - pduSessionTypes
         sscModes
      properties:
        pduSessionTypes:
          $ref: '#/components/schemas/PduSessionTypes'
        sscModes:
          $ref: '#/components/schemas/SscModes'
        iwkEpsInd:
          $ref: '#/components/schemas/IwkEpsInd'
        5gQosProfile:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/SubscribedDefaultQos'
        sessionAmbr:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ambr'
        3gppChargingCharacteristics:
          $ref: '#/components/schemas/3GppChargingCharacteristics'
        staticIpAddress:
          type: array
          items:
            $ref: '#/components/schemas/IpAddress'
          minItems: 1
          maxItems: 2
        upSecurity:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/UpSecurity'
        pduSessionContinuityInd:
          $ref: '#/components/schemas/PduSessionContinuityInd'
        niddNefId:
          $ref: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/NefId'
        niddInfo:
         $ref: '#/components/schemas/NiddInformation'
        redundantSessionAllowed:
          type: boolean
        acsInfo:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/AcsInfo'
        ipv4FrameRouteList:
          type: array
          items:
            $ref: '#/components/schemas/FrameRouteInfo'
          minItems: 1
        ipv6FrameRouteList:
```

```
type: array
      items:
        $ref: '#/components/schemas/FrameRouteInfo'
     minItems: 1
    atsssAllowed:
     type: boolean
     default: false
    secondaryAuth:
     type: boolean
    dnAaaIpAddressAllocation:
     type: boolean
    dnAaaAddress:
     $ref: '#/components/schemas/IpAddress'
    iptvAccCtrlInfo:
     type: string
NiddInformation:
  type: object
  required:
    - afId
 properties:
   afId:
     type: string
    gpsi:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
    extGroupId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/ExternalGroupId'
IpAddress:
 type: object
  oneOf:
    - required:
     - ipv4Addr
    - required:
      - ipv6Addr
    - required:
      - ipv6Prefix
  properties:
    ipv4Addr:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
    ipv6Addr:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
    ipv6Prefix:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
PduSessionTypes:
  type: object
  required:
    - defaultSessionType
 properties:
   defaultSessionType:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionType'
    allowedSessionTypes:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionType'
     minItems: 1
SscModes:
  type: object
  required:
    - defaultSscMode
 properties:
   defaultSscMode:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/SscMode'
    allowedSscModes:
     type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SscMode'
     minItems: 1
     maxItems: 2
SmsSubscriptionData:
  type: object
  properties:
    smsSubscribed:
     $ref: '#/components/schemas/SmsSubscribed'
    sharedSmsSubsDataId:
```

```
$ref: '#/components/schemas/SharedDataId'
SmsManagementSubscriptionData:
  type: object
  properties:
   supportedFeatures:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
   mtSmsSubscribed:
     type: boolean
   mtSmsBarringAll:
     type: boolean
   mtSmsBarringRoaming:
     type: boolean
   moSmsSubscribed:
     type: boolean
   moSmsBarringAll:
     type: boolean
   moSmsBarringRoaming:
     type: boolean
    sharedSmsMnqDataIds:
      type: array
      items:
        $ref: '#/components/schemas/SharedDataId'
     minItems: 1
    traceData:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/TraceData'
SdmSubscription:
  type: object
  required:
    - nfInstanceId
    - callbackReference
    - monitoredResourceUris
  properties:
   nfInstanceId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    implicitUnsubscribe:
     type: boolean
    expires:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    callbackReference:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
    amfServiceName:
      $ref: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/ServiceName'
    monitoredResourceUris:
     type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
     minItems: 1
    singleNssai:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
    dnn:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
    subscriptionId:
     type: string
   plmnId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    immediateReport:
     type: boolean
     default: false
    report:
     $ref: '#/components/schemas/SubscriptionDataSets'
    supportedFeatures:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    contextInfo:
     $ref: '#/components/schemas/ContextInfo'
SdmSubsModification:
  type: object
  properties:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    monitoredResourceUris:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
      minTtems: 1
```

```
ModificationNotification:
 type: object
 required:
    - notifyItems
 properties:
   notifyItems:
     type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/NotifyItem'
IdTranslationResult:
  type: object
 required:
    - supi
 properties:
   supportedFeatures:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
     $ref: 'TS29571 CommonData.yaml#/components/schemas/Supi'
    gpsi:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
AcknowledgeInfo:
  type: object
  required:
    - provisioningTime
 properties:
   sorMacIue:
     $ref: 'TS29509_Nausf_SoRProtection.yaml#/components/schemas/SorMac'
   upuMacIue:
     $ref: 'TS29509_Nausf_UPUProtection.yaml#/components/schemas/UpuMac'
    securedPacket:
     $ref: '#/components/schemas/SecuredPacket'
    provisioningTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
SorInfo:
  type: object
 properties:
   steeringContainer:
     $ref: '#/components/schemas/SteeringContainer'
   ackInd:
     $ref: 'TS29509_Nausf_SoRProtection.yaml#/components/schemas/AckInd'
   sorMacIausf:
     $ref: 'TS29509_Nausf_SoRProtection.yaml#/components/schemas/SorMac'
    countersor:
     $ref: 'TS29509_Nausf_SoRProtection.yaml#/components/schemas/CounterSor'
   provisioningTime:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
  required:
    - ackInd
    - provisioningTime
SharedDataIds:
  type: array
  items:
    $ref: '#/components/schemas/SharedDataId'
 minItems: 1
 uniqueItems: true
UpuInfo:
  type: object
 properties:
    upuDataList:
     type: array
       $ref: 'TS29509_Nausf_UPUProtection.yaml#/components/schemas/UpuData'
     minItems: 1
    upuRegInd:
     $ref: '#/components/schemas/UpuRegInd'
    upuAckInd:
     $ref: 'TS29509_Nausf_UPUProtection.yaml#/components/schemas/UpuAckInd'
    upuMacIausf:
     $ref: 'TS29509_Nausf_UPUProtection.yaml#/components/schemas/UpuMac'
     $ref: 'TS29509_Nausf_UPUProtection.yaml#/components/schemas/CounterUpu'
   provisioningTime:
```

```
$ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
 required:
    - upuDataList
    - upuAckInd
    - upuRegInd
    - provisioningTime
SharedData:
  type: object
  required:

    sharedDataId

 properties:
    sharedDataId:
     $ref: '#/components/schemas/SharedDataId'
    sharedAmData:
     $ref: '#/components/schemas/AccessAndMobilitySubscriptionData'
    sharedSmsSubsData:
     $ref: '#/components/schemas/SmsSubscriptionData'
    sharedSmsMngSubsData:
     $ref: '#/components/schemas/SmsManagementSubscriptionData'
    sharedDnnConfigurations:
      type: object
     additionalProperties:
        $ref: '#/components/schemas/DnnConfiguration'
    sharedTraceData:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/TraceData'
    sharedSnssaiInfos:
     type: object
      additionalProperties:
        $ref: '#/components/schemas/SnssaiInfo'
    sharedVnGroupDatas:
     type: object
      additionalProperties:
        $ref: '#/components/schemas/VnGroupData'
      minProperties: 1
TraceDataResponse:
  type: object
 properties:
    traceData:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/TraceData'
    sharedTraceDataId:
      $ref: '#/components/schemas/SharedDataId'
SteeringContainer:
  oneOf:
    - type: array
     items:
        $ref: 'TS29509_Nausf_SoRProtection.yaml#/components/schemas/SteeringInfo'
     minItems: 1
    - $ref: '#/components/schemas/SecuredPacket'
GroupIdentifiers:
  type: object
  properties:
    extGroupId:
      $ref: '#/components/schemas/ExtGroupId'
    intGroupId:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
    ueIdList:
      type: array
      items:
        $ref: '#/components/schemas/UeId'
     minItems: 1
VnGroupData:
  type: object
  properties:
    pduSessionTypes:
      $ref: '#/components/schemas/PduSessionTypes'
    dnn:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
    singleNssai:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
    appDescriptors:
     type: array
      items:
```

```
$ref: '#/components/schemas/AppDescriptor'
     minItems: 1
AppDescriptor:
  type: object
  properties:
   osId:
     $ref: 'TS29519_Policy_Data.yaml#/components/schemas/OsId'
    appId:
     type: string
AdditionalSnssaiData:
  type: object
 properties:
   requiredAuthnAuthz:
     type: boolean
AppPortId:
  type: object
 properties:
    destinationPort:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint16'
    originatorPort:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint16'
LcsPrivacyData:
  type: object
 properties:
    lpi:
     $ref: '#/components/schemas/Lpi'
    unrelatedClass:
     $ref: '#/components/schemas/UnrelatedClass'
    plmnOperatorClasses:
      type: array
      items:
        $ref: '#/components/schemas/PlmnOperatorClass'
     minItems: 1
Lpi:
  type: object
  required:
   - locationPrivacyInd
 properties:
    locationPrivacyInd:
     $ref: '#/components/schemas/LocationPrivacyInd'
    validTimePeriod:
     $ref: '#/components/schemas/ValidTimePeriod'
UnrelatedClass:
 type: object
 required:
    - defaultUnrelatedClass
  properties:
   defaultUnrelatedClass:
     $ref: '#/components/schemas/DefaultUnrelatedClass'
    externalUnrelatedClass:
     $ref: '#/components/schemas/ExternalUnrelatedClass'
    serviceTypeUnrelatedClasses:
      type: array
      items:
        $ref: '#/components/schemas/ServiceTypeUnrelatedClass'
     minItems: 1
PlmnOperatorClass:
  type: object
  required:
    - lcsClientClass
    - lcsClientIds
  properties:
    lcsClientClass:
      $ref: '#/components/schemas/LcsClientClass'
    lcsClientIds:
      type: array
      items:
        $ref: '#/components/schemas/LcsClientId'
      minItems: 1
ValidTimePeriod:
```

```
type: object
 properties:
   startTime:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
   endTime:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
ExternalUnrelatedClass:
 properties:
   lcsClientExternals:
     type: array
     items:
       $ref: '#/components/schemas/LcsClientExternal'
     minItems: 1
   afExternals:
     type: array
     items:
       $ref: '#/components/schemas/AfExternal'
     minItems: 1
   lcsClientGroupExternals:
     type: array
     items:
       $ref: '#/components/schemas/LcsClientGroupExternal'
     minItems: 1
AfExternal:
  type: object
 properties:
   afId:
     $ref: '#/components/schemas/AfId'
   allowedGeographicArea:
     type: array
     items:
       minItems: 1
   privacyCheckRelatedAction:
     $ref: '#/components/schemas/PrivacyCheckRelatedAction'
   validTimePeriod:
     $ref: '#/components/schemas/ValidTimePeriod'
LcsClientExternal:
 type: object
 properties:
   allowedGeographicArea:
     type: array
     items:
       $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/GeographicArea'
     minItems: 1
   privacyCheckRelatedAction:
     $ref: '#/components/schemas/PrivacyCheckRelatedAction'
   validTimePeriod:
     $ref: '#/components/schemas/ValidTimePeriod'
LcsClientGroupExternal:
 type: object
 properties:
   lcsClientGroupId:
     $ref: '#/components/schemas/ExtGroupId'
   allowedGeographicArea:
     type: array
     items:
       $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/GeographicArea'
     minItems: 1
   privacyCheckRelatedAction:
     $ref: '#/components/schemas/PrivacyCheckRelatedAction'
   validTimePeriod:
     $ref: '#/components/schemas/ValidTimePeriod'
ServiceTypeUnrelatedClass:
 type: object
 required:
    - serviceType
 properties:
   serviceType:
     $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/LcsServiceType'
   allowedGeographicArea:
     type: array
     items:
```

```
$ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/GeographicArea'
         minItems: 1
       privacyCheckRelatedAction:
         $ref: '#/components/schemas/PrivacyCheckRelatedAction'
        codeWordInd:
         $ref: '#/components/schemas/CodeWordInd'
        validTimePeriod:
          $ref: '#/components/schemas/ValidTimePeriod'
        codeWordList:
          type: array
          items:
            $ref: '#/components/schemas/CodeWord'
         minItems: 1
   LcsMoData:
     type: object
      required:
        - allowedServiceClasses
     properties:
       allowedServiceClasses:
          type: array
          items:
            $ref: '#/components/schemas/LcsMoServiceClass'
         minItems: 1
   LcsBroadcastAssistanceTypesData:
      type: object
      required:
       - locationAssistanceType
     properties:
        locationAssistanceType:
         type: array
          items:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Binary'
         minItems: 1
   EcRestrictionDataWb:
      type: object
      anyOf:
        - required: [ ecModeARestricted ]
        - required: [ ecModeBRestricted ]
     properties:
       ecModeARestricted:
         type: boolean
        ecModeBRestricted:
         type: boolean
   ExpectedUeBehaviourData:
      type: object
      properties:
       stationaryIndication:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/StationaryIndication'
        communicationDurationTime:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
       periodicTime:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
        scheduledCommunicationTime:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/ScheduledCommunicationTime'
        scheduledCommunicationType:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/ScheduledCommunicationType'
        expectedUmts:
          type: array
          items:
            $ref: 'TS29503_Nudm_PP.yaml#/components/schemas/LocationArea'
         minTtems: 1
         description: Identifies the UE's expected geographical movement. The attribute is only
applicable in 5G.
       trafficProfile:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/TrafficProfile'
        batteryIndication:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/BatteryIndication'
        validityTime:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
   SuggestedPacketNumDl:
      type: object
      required:
```

```
- suggestedPacketNumDl
 properties:
    suggestedPacketNumDl:
     type: integer
     minimum: 1
    validityTime:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
FrameRouteInfo:
  type: object
 properties:
    ipv4Mask:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4AddrMask'
    ipv6Prefix:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
SorUpdateInfo:
  type: object
 required:
    - vplmnId
 properties:
    vplmnId:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
EnhancedCoverageRestrictionData:
  type: object
 properties:
   plmnEcInfoList:
     type: array
      items:
        $ref: 'TS29503_Nudm_PP.yaml#/components/schemas/PlmnEcInfo'
     minItems: 1
EdrxParameters:
  type: object
  required:
    - ratType
    - edrxValue
 properties:
    ratType:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
    edrxValue:
     type: string
     pattern: '^([0-1]{4})$'
PtwParameters:
  type: object
  required:
    - operationMode
    - ptwValue
 properties:
    operationMode:
     $ref: '#/components/schemas/OperationMode'
    ptwValue:
     type: string
     pattern: '^([0-1]{4});
UeId:
  type: object
 required:
    - supi
 properties:
    supi:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
    gpsiList:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
     minItems: 1
V2xSubscriptionData:
  type: object
 properties:
   nrV2xServicesAuth:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/NrV2xAuth'
    lteV2xServicesAuth:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/LteV2xAuth'
    nrUePc5Ambr:
```

```
$ref: 'TS29571_CommonData.yaml#/components/schemas/BitRate'
        ltePc5Ambr:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/BitRate'
    DefaultUnrelatedClass:
     type: object
     properties:
        allowedGeographicArea:
          type: array
          items:
            $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/GeographicArea'
         minItems: 1
        privacyCheckRelatedAction:
         $ref: '#/components/schemas/PrivacyCheckRelatedAction'
        codeWordInd:
         $ref: '#/components/schemas/CodeWordInd'
        validTimePeriod:
          $ref: '#/components/schemas/ValidTimePeriod'
        codeWordList:
         type: array
          items:
            $ref: '#/components/schemas/CodeWord'
         minItems: 1
   ContextInfo:
      type: object
     properties:
        origHeaders:
         type: array
          items:
           type: string
         minItems: 1
# SIMPLE TYPES:
    UeUsageType:
     type: integer
   MpsPriorityIndicator:
     type: boolean
   McsPriorityIndicator:
     type: boolean
   DnnIndicator:
     type: boolean
   LboRoamingAllowed:
      type: boolean
    SmsSubscribed:
     type: boolean
    3GppChargingCharacteristics:
     type: string
    MicoAllowed:
     type: boolean
    SharedDataId:
     type: string
     pattern: '^[0-9]{5,6}-.+$'
    IwkEpsInd:
     type: boolean
    SecuredPacket:
     type: string
      format: base64
    UpuRegInd:
     type: boolean
    ExtGroupId:
      type: string
     pattern: '^extgroupid-[^@]+@[^@]+$'
    NbIoTUePriority:
```

```
type: integer
     minimum: 0
     maximum: 255
    CodeWord:
     type: string
   AfId:
      type: string
   LcsClientId:
     type: string
# ENUMS:
   DataSetName:
      anyOf:
        - type: string
         enum:
         - AM
         - SMF_SEL
         - UEC_SMF
         - UEC_SMSF
         - SMS_SUB
         - SM
         - TRACE
         - SMS_MNG
         - LCS_PRIVACY
- LCS_MO
         - UEC_AMF
          - V2X
        - type: string
    PduSessionContinuityInd:
     anyOf:
        - type: string
         enum:
          - MAINTAIN_PDUSESSION
         - RECONNECT_PDUSESSION
          - RELEASE_PDUSESSION
        - type: string
    LocationPrivacyInd:
     anyOf:
        - type: string
         enum:
         - LOCATION_DISALLOWED
         - LOCATION_ALLOWED
        - type: string
    PrivacyCheckRelatedAction:
      anyOf:
        - type: string
         enum:
          - LOCATION_NOT_ALLOWED
          - LOCATION_ALLOWED_WITH_NOTIFICATION
         - LOCATION_ALLOWED_WITHOUT_NOTIFICATION
         - LOCATION ALLOWED WITHOUT RESPONSE
         - LOCATION_RESTRICTED_WITHOUT_RESPONSE
        - type: string
    LcsClientClass:
     anyOf:
        - type: string
         enum:
         - BROADCAST_SERVICE
         - OM_IN_HPLMN
         - OM_IN_VPLMN
         - ANONYMOUS_LOCATION_SERVICE
          - SPECIFIC_SERVICE
        - type: string
    LcsMoServiceClass:
      anyOf:
        - type: string
```

enum:

```
- BASIC_SELF_LOCATION
      - AUTONOMOUS_SELF_LOCATION
      - TRANSFER_TO_THIRD_PARTY
    - type: string
OperationMode:
  anyOf:
    - type: string
     enum:
     - WB_S1
     - NB_S1
     - WB N1
     - NB_N1
    - type: string
SorUpdateIndicator:
  anyOf:
    - type: string
     enum:
     - INITIAL_REGISTRATION
      - EMERGENCY_REGISTRATION
    - type: string
CodeWordInd:
  anyOf:
    - type: string
     enum:
     - CODEWORD_CHECK_IN_UE
      - CODEWORD_CHECK_IN_GMLC
    - type: string
MdtUserConsent:
  anyOf:
    - type: string
     enum:
      - CONSENT_NOT_GIVEN
      - CONSENT_GIVEN
    - type: string
```

## A.3 Nudm\_UECM API

```
openapi: 3.0.0
info:
 version: '1.1.2'
  title: 'Nudm_UECM'
  description:
   Nudm Context Management Service.
    © 2020, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
   All rights reserved.
externalDocs:
 description: 3GPP TS 29.503 Unified Data Management Services, version 16.6.0
 url: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.503/'
  - url: '{apiRoot}/nudm-uecm/v1'
   variables:
      apiRoot:
        default: https://example.com
       description: apiRoot as defined in clause clause 4.4 of 3GPP TS 29.501.
security:
  - oAuth2ClientCredentials:
   - nudm-uecm
  - {}
paths:
  /{ueId}/registrations:
     summary: retrieve UE registration data sets
      operationId: GetRegistrations
       - UECM Registration Info Retrieval
      parameters:
```

```
- name: ueId
          in: path
         description: Identifier of the UE
         required: true
          schema:
           $ref: 'TS29571_CommonData.yaml#/components/schemas/VarUeId'
        - name: supported-features
         in: query
          schema:
           $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        - name: registration-dataset-names
         in: query
         style: form
          explode: false
         description: List of UECM registration dataset names
         required: true
         schema:
             $ref: '#/components/schemas/RegistrationDatasetNames'
        - name: single-nssai
         in: query
         content:
            application/json:
               $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
        - name: dnn
          in: query
          schema:
             $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
      responses:
        '200':
         description: Expected response to a valid request
         content:
           application/json:
              schema:
                $ref: '#/components/schemas/RegistrationDataSets'
        '400':
         $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
         $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        503:
         $ref: 'TS29571_CommonData.yaml#/components/responses/503'
       default:
         description: Unexpected error
  /{ueId}/registrations/amf-3gpp-access:
   put:
     summary: register as AMF for 3GPP access
      operationId: 3GppRegistration
        - AMF registration for 3GPP access
     parameters:
        - name: ueId
          in: path
         description: Identifier of the UE
         required: true
         schema:
           $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      requestBody:
       content:
          application/json:
            schema:
              $ref: '#/components/schemas/Amf3GppAccessRegistration'
       required: true
      responses:
        201':
         description: Created
          content:
           application/json:
              schema:
                $ref: '#/components/schemas/Amf3GppAccessRegistration'
         headers:
              description: 'Contains the URI of the newly created resource, according to the
structure: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/amf-3gpp-access'
```

```
required: true
              schema:
                type: string
        '200':
          description: OK
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/Amf3GppAccessRegistration'
        '204':
          description: No content
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        503:
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
      callbacks:
        deregistrationeNotification:
          '{request.body#/deregCallbackUri}':
            post:
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/DeregistrationData'
              responses:
                '204':
                  description: Successful Notification response
                  description: Temporary Redirect
                  content:
                    application/problem+json:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. AMF) to which the request is redirected'
                      required: true
                      schema:
                        type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                      schema:
                        type: string
                '308':
                  description: Permanent Redirect
                  content:
                    application/problem+json:
                      schema:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. AMF) to which the request is redirected'
                      required: true
                      schema:
                        type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                      schema:
                        type: string
                '400':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/400'
                '404':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/404'
                500:
                  $ref: 'TS29571_CommonData.yaml#/components/responses/500'
```

```
15031:
                  $ref: 'TS29571_CommonData.yaml#/components/responses/503'
                default:
                  description: Unexpected error
        pcscfRestorationNotification:
          '{request.body#/pcscfRestorationCallbackUri}':
            post:
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/PcscfRestorationNotification'
              responses:
                  description: Successful Notification response
                '307':
                  description: Temporary Redirect
                  content:
                    application/problem+json:
                      schema:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. AMF) to which the request is redirected'
                      required: true
                      schema:
                        type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                      schema:
                        type: string
                '308':
                  description: Permanent Redirect
                  content:
                    application/problem+json:
                      schema:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. AMF) to which the request is redirected'
                      required: true
                      schema:
                        type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                      schema:
                        type: string
                14001:
                  $ref: 'TS29571_CommonData.yaml#/components/responses/400'
                  $ref: 'TS29571_CommonData.yaml#/components/responses/404'
                '409':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/409'
                '500':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/500'
                '503':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/503'
                default:
                  description: Unexpected error
    patch:
      summary: Update a parameter in the AMF registration for 3GPP access
      operationId: Update3GppRegistration
      tags:
        - Parameter update in the AMF registration for 3GPP access
      parameters:
        - name: ueId
         in: path
          description: Identifier of the UE
          required: true
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
```

```
in: query
       description: Features required to be supported by the target NF
       schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
   requestBody:
     content:
       application/merge-patch+json:
          schema:
            $ref: '#/components/schemas/Amf3GppAccessRegistrationModification'
     required: true
   responses:
       2001:
       description: Expected response to a valid request
       content:
         application/json:
           schema:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/PatchResult'
      12041:
       description: Expected response to a valid request
      '400':
       $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
        $ref: 'TS29571_CommonData.yaml#/components/responses/403'
       $ref: 'TS29571 CommonData.yaml#/components/responses/404'
      '422':
       description: Unprocessable Request
       content:
         application/problem+json:
           schema:
             $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
      '500':
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
       description: Unexpected error
 get:
   summary: retrieve the AMF registration for 3GPP access information
   operationId: Get3GppRegistration
    tags:
     - AMF 3Gpp-access Registration Info Retrieval
   parameters:
      - name: ueId
       in: path
       description: Identifier of the UE
       required: true
       schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/VarUeId'
      - name: supported-features
       in: query
       schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    responses:
       description: Expected response to a valid request
       content:
         application/json:
           schema:
              $ref: '#/components/schemas/Amf3GppAccessRegistration'
      '400':
       $ref: 'TS29571_CommonData.yaml#/components/responses/400'
       $ref: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      '500':
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
       description: Unexpected error
/{ueId}/registrations/amf-3gpp-access/dereg-amf:
    summary: trigger AMF for 3GPP access deregistration
   operationId: deregAMF
   tags:
```

```
- Trigger AMF for 3GPP access deregistration
   parameters:
      - name: ueId
       in: path
       description: Identifier of the UE
       required: true
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
    requestBody:
     content:
       application/json:
          schema:
            $ref: '#/components/schemas/AmfDeregInfo'
     required: true
    responses:
      '204':
       description: No content
      '400':
        $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
       $ref: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29571_CommonData.yaml#/components/responses/404'
       $ref: 'TS29571 CommonData.vaml#/components/responses/500'
      15031:
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
       description: Unexpected error
/{ueId}/registrations/amf-3gpp-access/pei-update:
    summary: Updates the PEI in the 3GPP access registration context
    operationId: PeiUpdate
    tags:
      - PEI Update
   parameters:
      - name: ueId
       in: path
       description: Identifier of the UE
       required: true
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
    requestBody:
     content:
       application/json:
         schema:
            $ref: '#/components/schemas/PeiUpdateInfo'
     required: true
   responses:
      '204':
       description: No content
      '400':
        $ref: 'TS29571_CommonData.yaml#/components/responses/400'
       $ref: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      '500':
        $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
       description: Unexpected error
/{ueId}/registrations/amf-non-3gpp-access:
 put:
   summary: register as AMF for non-3GPP access
    operationId: Non3GppRegistration
      - AMF registration for non-3GPP access
   parameters:
      - name: ueId
       in: path
        description: Identifier of the UE
       required: true
       schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
```

```
requestBody:
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/AmfNon3GppAccessRegistration'
      responses:
        '201':
          description: Created
            application/json:
              schema:
                $ref: '#/components/schemas/AmfNon3GppAccessRegistration'
          headers:
            Location:
              description: 'Contains the URI of the newly created resource, according to the
structure: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/amf-non-3gpp-access'
              required: true
              schema:
               type: string
        '200':
          description: OK
          content:
           application/json:
              schema:
                $ref: '#/components/schemas/AmfNon3GppAccessRegistration'
        '204':
          description: No Content
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
      callbacks:
        deregistrationeNotification:
          '{request.body#/deregCallbackUri}':
            post:
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                     $ref: '#/components/schemas/DeregistrationData'
              responses:
                '204':
                  description: Successful Notification response
                '307':
                  description: Temporary Redirect
                  content:
                    application/problem+json:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. AMF) to which the request is redirected'
                      required: true
                      schema:
                        type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                      schema:
                        type: string
                '308':
                  description: Permanent Redirect
                  content:
                    application/problem+json:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
```

```
Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. AMF) to which the request is redirected'
                      required: true
                      schema:
                       type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                     schema:
                        type: string
                '400':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/400'
                '404':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/404'
                  $ref: 'TS29571_CommonData.yaml#/components/responses/500'
                '503':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/503'
                default:
                  description: Unexpected error
        pcscfRestorationNotification:
          '{request.body#/pcscfRestorationCallbackUri}':
            post:
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/PcscfRestorationNotification'
              responses:
                  description: Successful Notification response
                '307':
                  description: Temporary Redirect
                  content:
                    application/problem+json:
                      schema:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. AMF) to which the request is redirected'
                      required: true
                      schema:
                       type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                     schema:
                        type: string
                '308':
                  description: Permanent Redirect
                    application/problem+json:
                      schema:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. AMF) to which the request is redirected'
                      required: true
                      schema:
                        type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                     schema:
                        type: string
                '400':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/400'
                '404':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/404'
                '500':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/500'
                  $ref: 'TS29571_CommonData.yaml#/components/responses/503'
                default:
```

```
description: Unexpected error
patch:
    summary: update a parameter in the AMF registration for non-3GPP access
    {\tt operationId:} \ {\tt UpdateNon3GppRegistration}
        - Parameter update in the AMF registration for non-3GPP access
   parameters:
        - name: ueId
           in: path
           description: Identifier of the UE
           required: true
           schema:
               $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: supported-features
           in: query
           description: Features required to be supported by the target NF
           schema:
               \verb| fref: TS29571_CommonData.yaml| \#/components/schemas/SupportedFeatures | TS29571_CommonData.yaml| \#/components/schemas/SupportedFeatures | TS29571_CommonData.yaml| \#/components/schemas/SupportedFeatures | TS29571_CommonData.yaml| \#/components/schemas/SupportedFeatures | TS29571_CommonData.yaml| \#/components/schemas/SupportedFeatures | TS29571_CommonData.yaml| #/components/schemas/SupportedFeatures | TS2957_CommonData.yaml| #/components/schemas/schemas/schemas/schemas/schemas/schemas/schemas/schemas/schemas/schemas/schemas/schemas/schemas/schemas/schemas/schemas/schemas/schemas/schemas/sch
       content:
           application/merge-patch+json:
               schema:
                    $ref: '#/components/schemas/AmfNon3GppAccessRegistrationModification'
       required: true
    responses:
        '200':
           description: Expected response to a valid request
               application/json:
                   schema:
                       $ref: 'TS29571_CommonData.yaml#/components/schemas/PatchResult'
        '204':
           description: Expected response to a valid request
        '400':
           $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
           $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
           $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '422':
           description: Unprocessable Request
           content:
               application/problem+json:
                   schema:
                       $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
        '500':
           $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        15031:
           $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
           description: Unexpected error
get:
    summary: retrieve the AMF registration for non-3GPP access information
    operationId: GetNon3GppRegistration
   tags:
        - AMF non-3GPP-access Registration Info Retrieval
    parameters:
         - name: ueId
           in: path
           description: Identifier of the UE
           required: true
           schema:
               $ref: 'TS29571_CommonData.yaml#/components/schemas/VarUeId'
        - name: supported-features
           in: query
           schema:
               $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    responses:
         2001:
           description: Expected response to a valid request
           content:
               application/json:
                  schema:
                       $ref: '#/components/schemas/AmfNon3GppAccessRegistration'
        '400':
           $ref: 'TS29571_CommonData.yaml#/components/responses/400'
           $ref: 'TS29571_CommonData.yaml#/components/responses/403'
```

```
'404':
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      15001:
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
     default:
       description: Unexpected error
/{ueId}/registrations/smf-registrations:
 get:
   summary: retrieve the SMF registration information
   operationId: GetSmfRegistration
   tags:
      - SMF SmfRegistration
   parameters:
      - name: ueId
       in: path
       description: Identifier of the UE
       required: true
       schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/VarUeId'
      - name: single-nssai
       in: query
       content:
         application/json:
           schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
      - name: dnn
       in: query
       schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
      - name: supported-features
       in: query
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
   responses:
      '200':
       description: Expected response to a valid request
       content:
         application/json:
           schema:
              $ref: '#/components/schemas/SmfRegistrationInfo'
      '400':
        $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
       $ref: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      5031:
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
       description: Unexpected error
/{ueId}/registrations/smf-registrations/{pduSessionId}:
   summary: register as SMF
   operationId: Registration
   tags:
      - SMF SmfRegistration
   parameters:
      - name: ueId
       in: path
       description: Identifier of the UE
       required: true
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      - name: pduSessionId
       in: path
       description: Identifier of the PDU session
       required: true
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionId'
   requestBody:
     content:
       application/json:
```

```
$ref: '#/components/schemas/SmfRegistration'
       required: true
      responses:
        '201':
          description: Created
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/SmfRegistration'
          headers:
            Location:
              description: 'Contains the URI of the newly created resource, according to the
structure: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/smf-registrations/{pduSessionId}'
              required: true
              schema:
                type: string
        12001:
          description: Expected response to a valid request
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/SmfRegistration'
        '204':
          description: No content
        400:
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
      callbacks:
        deregistrationeNotification:
          '{request.body#/deregCallbackUri}':
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/DeregistrationData'
              responses:
                '204':
                  description: Successful Notification response
                '307':
                  description: Temporary Redirect
                  content:
                    application/problem+json:
                       $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. SMF) to which the request is redirected
                      required: true
                      schema:
                       type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                      schema:
                        type: string
                '308':
                  description: Permanent Redirect
                  content:
                    application/problem+json:
                      schema:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. SMF) to which the request is redirected'
```

```
required: true
                      schema:
                        type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                      schema:
                        type: string
                '400':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/400'
                  $ref: 'TS29571_CommonData.yaml#/components/responses/404'
                15001:
                  $ref: 'TS29571_CommonData.yaml#/components/responses/500'
                  $ref: 'TS29571_CommonData.yaml#/components/responses/503'
                default:
                  description: Unexpected error
        pcscfRestorationNotification:
          '{request.body#/pcscfRestorationCallbackUri}':
            post:
              requestBody:
                required: true
                content:
                  application/ison:
                    schema:
                      $ref: '#/components/schemas/PcscfRestorationNotification'
              responses:
                '204':
                  description: Successful Notification response
                '307':
                  description: Temporary Redirect
                  content:
                    application/problem+json:
                      schema:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. SMF) to which the request is redirected'
                      required: true
                      schema:
                        type: string
                    3gpp-Sbi-Target-Nf-Id:
                     description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                     schema:
                        type: string
                '308':
                  description: Permanent Redirect
                  content:
                    application/problem+json:
                      schema:
                        $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
                  headers:
                    Location:
                      description: 'Contains the new Callback URI of the target NF Service Consumer
(e.g. SMF) to which the request is redirected'
                      required: true
                      schema:
                        type: string
                    3gpp-Sbi-Target-Nf-Id:
                      description: 'Identifier of target NF (service) instance towards which the
notification is redirected'
                      schema:
                        type: string
                '400':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/400'
                '404':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/404'
                '500':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/500'
                503:
                  $ref: 'TS29571_CommonData.yaml#/components/responses/503'
                default:
                  description: Unexpected error
    delete:
      summary: delete an SMF registration
```

```
operationId: SmfDeregistration
   tags:
     - SMF Deregistration
   parameters:
      - name: ueId
       in: path
       description: Identifier of the UE
       required: true
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      - name: pduSessionId
       in: path
       description: Identifier of the PDU session
       required: true
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionId'
      - name: smf-set-id
       in: query
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/NfSetId'
   responses:
      '204':
       description: Expected response to a valid request
       $ref: 'TS29571 CommonData.yaml#/components/responses/400'
      '404':
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
       description: Unprocessable Request
       content:
         application/problem+json:
           schema:
             $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      5031:
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
     default:
       description: Unexpected error
 get:
   summary: get an SMF registration
   operationId: RetrieveSmfRegistration
   tags:
      - Retrieve SMF Registration
   parameters:
      - name: ueId
       in: path
       description: Identifier of the UE
       required: true
         $ref: 'TS29571 CommonData.yaml#/components/schemas/Supi'
      - name: pduSessionId
       in: path
       description: Identifier of the PDU session
       required: true
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionId'
    responses:
       description: Expected response to a valid request
       content:
         application/json:
           schema:
              $ref: '#/components/schemas/SmfRegistration'
      '400':
       $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
       $ref: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      '500':
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      503:
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
       description: Unexpected error
/{ueId}/registrations/smsf-3gpp-access:
```

```
summary: register as SMSF for 3GPP access
      operationId: 3GppSmsfRegistration
      tags:
        - SMSF registration for 3GPP access
      parameters:
        - name: ueId
          in: path
          description: Identifier of the UE
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      requestBody:
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/SmsfRegistration'
       required: true
      responses:
        '201':
          description: Created
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/SmsfRegistration'
          headers:
            Location:
              description: 'Contains the URI of the newly created resource, according to the
structure: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/smsf-3gpp-access'
              required: true
              schema:
                type: string
        '200':
          description: Expected response to a valid request
          content:
            application/json:
             schema:
                $ref: '#/components/schemas/SmsfRegistration'
        '204':
          description: No content
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        503:
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
    delete:
      summary: delete the SMSF registration for 3GPP access
      operationId: 3GppSmsfDeregistration
      tags:
        - SMSF Deregistration for 3GPP Access
      parameters:
        - name: ueId
          in: path
          description: Identifier of the UE
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: smsf-set-id
          in: query
          schema:
           $ref: 'TS29571_CommonData.yaml#/components/schemas/NfSetId'
      responses:
        '204':
          description: Expected response to a valid request
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          description: Unprocessable Request
          content:
```

```
application/problem+json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
        500:
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
      summary: retrieve the SMSF registration for 3GPP access information
      operationId: Get3GppSmsfRegistration
      tags:
        - SMSF 3GPP access Registration Info Retrieval
     parameters:
        - name: ueId
         in: path
         description: Identifier of the UE
         required: true
         schema:
           $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
        - name: supported-features
          in: query
         schema:
           $ref: 'TS29571 CommonData.yaml#/components/schemas/SupportedFeatures'
      responses:
        '200':
         description: Expected response to a valid request
         content:
           application/json:
             schema:
                $ref: '#/components/schemas/SmsfRegistration'
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        500:
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
         $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
         description: Unexpected error
  /{ueId}/registrations/smsf-non-3gpp-access:
   put:
     summary: register as SMSF for non-3GPP access
      operationId: Non3GppSmsfRegistration
      tags:
        - SMSF registration for non-3GPP access
      parameters:
        - name: ueId
          in: path
         description: Identifier of the UE
         required: true
          schema:
           $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      requestBody:
        content:
         application/json:
            schema:
              $ref: '#/components/schemas/SmsfRegistration'
       required: true
      responses:
        '201':
         description: Created
         content:
            application/json:
              schema:
                $ref: '#/components/schemas/SmsfRegistration'
          headers:
            Location:
              description: 'Contains the URI of the newly created resource, according to the
structure: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/smsf-non-3gpp-access'
              required: true
              schema:
                type: string
```

```
'200':
     description: Expected response to a valid request
     content:
        application/json:
          schema:
           $ref: '#/components/schemas/SmsfRegistration'
    '204':
     description: No content
    '400':
      $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      $ref: 'TS29571_CommonData.yaml#/components/responses/403'
    '404':
      $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      $ref: 'TS29571_CommonData.yaml#/components/responses/500'
    '503':
      $ref: 'TS29571_CommonData.yaml#/components/responses/503'
    default:
     description: Unexpected error
delete:
  summary: delete SMSF registration for non 3GPP access
  operationId: Non3GppSmsfDeregistration
 tags:
    - SMSF Deregistration for non-3GPP access
  parameters:
    - name: ueId
      in: path
     description: Identifier of the UE
     required: true
     schema:
       $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
    - name: smsf-set-id
      in: query
      schema:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/NfSetId'
 responses:
    '204':
     description: Expected response to a valid request
    '400':
      $ref: 'TS29571_CommonData.yaml#/components/responses/400'
     $ref: 'TS29571_CommonData.yaml#/components/responses/404'
    '422':
     description: Unprocessable Request
     content:
        application/problem+json:
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/ProblemDetails'
    '500':
      $ref: 'TS29571_CommonData.yaml#/components/responses/500'
     5031:
      $ref: 'TS29571_CommonData.yaml#/components/responses/503'
    default:
     description: Unexpected error
qet:
  summary: retrieve the SMSF registration for non-3GPP access information
  operationId: GetNon3GppSmsfRegistration
  taqs:
    - SMSF non-3GPP access Registration Info Retrieval
  parameters:
    - name: ueId
     in: path
     description: Identifier of the UE
     required: true
     schema:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
    - name: supported-features
      in: query
      schema:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  responses:
    '200':
     description: Expected response to a valid request
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/SmsfRegistration'
```

```
'400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{ueId}/registrations/ip-sm-gw:
    put:
     summary: Register an IP-SM-GW
      {\tt operationId:\ IpSmGwRegistration}
      tags:
        - IP-SM-GW registration
      parameters:
        - name: ueId
          in: path
          description: Identifier of the UE
          required: true
          schema:
           $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      requestBody:
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/IpSmGwRegistration'
        required: true
      responses:
        201':
          description: Created
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/IpSmGwRegistration'
          headers:
            Location:
              description: 'Contains the URI of the newly created resource, according to the
structure: {apiRoot}/nudm-uecm/v1/{ueId}/registrations/ip-sm-gw'
              required: true
              schema:
                type: string
          description: Expected response to a valid request
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/IpSmGwRegistration'
        12041:
          description: No content
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
          $ref: 'TS29571 CommonData.vaml#/components/responses/404'
        500:
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
    delete:
      summary: Delete the IP-SM-GW registration
      operationId: IpSmGwDeregistration
        - IP-SM-GW Deregistration
      parameters:
        - name: ueId
          in: path
          description: Identifier of the UE
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
```

```
responses:
      '204':
       description: Expected response to a valid request
      '400':
       $ref:
             'TS29571_CommonData.yaml#/components/responses/400'
      '404':
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      '500':
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
     default:
       description: Unexpected error
 get:
   summary: Retrieve the IP-SM-GW registration information
   operationId: GetIpSmGwRegistration
   tags:
      - IP-SM-GW Registration Info Retrieval
   parameters:
      - name: ueId
       in: path
       description: Identifier of the UE
       required: true
       schema:
         $ref: 'TS29571 CommonData.yaml#/components/schemas/Supi'
   responses:
      '200':
       description: Expected response to a valid request
       content:
         application/json:
           schema:
             $ref: '#/components/schemas/IpSmGwRegistration'
      '400':
       $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
       $ref: 'TS29571_CommonData.yaml#/components/responses/403'
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      500:
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
       description: Unexpected error
/restore-pcscf:
 post:
   summary: Trigger the Restoration of the P-CSCF
   operationId: Trigger P-CSCF Restoration
      - Trigger P-CSCF Restoration
   requestBody:
     content:
       application/json:
         schema:
           $ref: '#/components/schemas/TriggerRequest'
     required: true
   responses:
       description: Successful response
      '400':
       $ref: 'TS29571_CommonData.yaml#/components/responses/400'
       $ref: 'TS29571 CommonData.yaml#/components/responses/403'
      '404':
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      '500':
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '501':
       $ref: 'TS29571_CommonData.yaml#/components/responses/501'
      '503':
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
       description: Unexpected error
/{ueId}/registrations/location:
 get:
   summary: retrieve the target UE's location information
```

```
operationId: GetLocationInfo
      tags:
       - UE Location Information retrieval
      parameters:
        - name: ueId
         in: path
         description: Identifier of the UE
         required: true
          schema:
           $ref: 'TS29571_CommonData.yaml#/components/schemas/VarUeId'
        - name: supported-features
         in: query
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
      responses:
        '200':
         description: Expected response to a valid request
          content:
           application/json:
             schema:
               $ref: '#/components/schemas/LocationInfo'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
         $ref: 'TS29571 CommonData.vaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        503:
         $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
         description: Unexpected error
components:
 securitySchemes:
   oAuth2ClientCredentials:
      type: oauth2
      flows:
       clientCredentials:
         tokenUrl: '{nrfApiRoot}/oauth2/token'
            nudm-uecm: Access to the nudm-uecm API
 schemas:
# COMPLEX TYPES:
   Amf3GppAccessRegistration:
     type: object
      required:
       - amfInstanceId
       - deregCallbackUri
        - guami
        - ratType
      properties:
        amfInstanceId:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        supportedFeatures:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
       purgeFlag:
         $ref: '#/components/schemas/PurgeFlag'
       pei:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Pei'
        imsVoPs:
         $ref: '#/components/schemas/ImsVoPs'
        deregCallbackUri:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
        amfServiceNameDereg:
         $ref: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/ServiceName'
       pcscfRestorationCallbackUri:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
        amfServiceNamePcscfRest:
          $ref: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/ServiceName'
        initialRegistrationInd:
         type: boolean
        quami:
```

```
$ref: 'TS29571_CommonData.yaml#/components/schemas/Guami'
   backupAmfInfo:
     type: array
     items:
       $ref: 'TS29571_CommonData.yaml#/components/schemas/BackupAmfInfo'
    drFlag:
     $ref: '#/components/schemas/DualRegistrationFlag'
    ratType:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
    urrpIndicator:
     type: boolean
    amfEeSubscriptionId:
     type: string
    epsInterworkingInfo:
     $ref: '#/components/schemas/EpsInterworkingInfo'
    ueSrvccCapability:
     type: boolean
    registrationTime:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    vgmlcAddress:
     $ref: '#/components/schemas/VgmlcAddress'
     $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/ContextInfo'
    noEeSubscriptionInd:
      type: boolean
      default: false
Amf3GppAccessRegistrationModification:
  type: object
  required:
    - guami
 properties:
   guami:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Guami'
   purgeFlag:
     $ref: '#/components/schemas/PurgeFlag'
   pei:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Pei'
    imsVoPs:
     $ref: '#/components/schemas/ImsVoPs'
   backupAmfInfo:
      type: array
       $ref: 'TS29571_CommonData.yaml#/components/schemas/BackupAmfInfo'
    epsInterworkingInfo:
     $ref: '#/components/schemas/EpsInterworkingInfo'
    ueSrvccCapability:
     type: boolean
     nullable: true
   noEeSubscriptionInd:
     type: boolean
      default: false
EpsInterworkingInfo:
  type: object
  properties:
    epsIwkPgws:
     description: A map (list of key-value pairs where Dnn serves as key) of EpsIwkPgws
      type: object
      additionalProperties:
        $ref: '#/components/schemas/EpsIwkPgw'
EpsIwkPgw:
  type: object
  required:
   - pgwFqdn
    - smfInstanceId
  properties:
   pgwFqdn:
     type: string
    smfInstanceId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
AmfNon3GppAccessRegistration:
  type: object
  required:
```

```
- amfInstanceId
    - imsVoPs
    - deregCallbackUri
    - guami
    - ratType
 properties:
    amfInstanceId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    supportedFeatures:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    purgeFlag:
     $ref: '#/components/schemas/PurgeFlag'
    pei:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Pei'
    imsVoPs:
     $ref: '#/components/schemas/ImsVoPs'
    deregCallbackUri:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
    amfServiceNameDereg:
     $ref: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/ServiceName'
    pcscfRestorationCallbackUri:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
    amfServiceNamePcscfRest:
     $ref: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/ServiceName'
    quami:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Guami'
    backupAmfInfo:
     type: array
     items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/BackupAmfInfo'
     minItems: 1
    ratType:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
    urrpIndicator:
     type: boolean
    amfEeSubscriptionId:
     type: string
    registrationTime:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    vgmlcAddress:
     $ref: '#/components/schemas/VgmlcAddress'
    contextInfo:
     $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/ContextInfo'
{\tt AmfNon3GppAccessRegistrationModification:}
  type: object
  required:
    - guami
  properties:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Guami'
    purgeFlag:
     $ref: '#/components/schemas/PurgeFlag'
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Pei'
    imsVoPs:
      $ref: '#/components/schemas/ImsVoPs'
    backupAmfInfo:
      type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/BackupAmfInfo'
SmfRegistration:
  type: object
  required:
    - smfInstanceId
    - pduSessionId
    - singleNssai
    - plmnId
  properties:
    smfInstanceId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    smfSetId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/NfSetId'
    supportedFeatures:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    pduSessionId:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionId'
```

```
singleNssai:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
   dnn:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
    emergencyServices:
     type: boolean
   pcscfRestorationCallbackUri:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
   plmnId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    pawFadn:
     type: string
    epdgInd:
     type: boolean
     default: false
    deregCallbackUri:
     $ref: 'TS29571_CommonData.yam1#/components/schemas/Uri'
    registrationReason:
     $ref: '#/components/schemas/RegistrationReason'
   registrationTime:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    contextInfo:
      $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/ContextInfo'
SmsfRegistration:
  type: object
  required:
    - smsfInstanceId
    - plmnId
  properties:
   smsfInstanceId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    smsfSetId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/NfSetId'
    supportedFeatures:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
   plmnId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    smsfMAPAddress:
     $ref: '#/components/schemas/E164Number'
    smsfDiameterAddress:
     $ref: '#/components/schemas/NetworkNodeDiameterAddress'
    registrationTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
     $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/ContextInfo'
DeregistrationData:
  type: object
 required:
    - deregReason
  properties:
   deregReason:
     $ref: '#/components/schemas/DeregistrationReason'
   accessType:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
    pduSessionId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionId'
    newSmfInstanceId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
PcscfRestorationNotification:
  type: object
  required:
    - supi
 properties:
   supi:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
NetworkNodeDiameterAddress:
 type: object
 required:
    - name
    - realm
 properties:
   name:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DiameterIdentity'
```

```
realm:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DiameterIdentity'
TriggerRequest:
 type: object
  required:
    - supi
 properties:
    supi:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
SmfRegistrationInfo:
  type: object
  required:
    - smfRegistrationList
 properties:
    smfRegistrationList:
      type: array
      items:
        $ref: '#/components/schemas/SmfRegistration'
      minItems: 1
IpSmGwRegistration:
  type: object
  anyOf:
    - required: [ ipSmGwMapAddress ]
    - required: [ ipSmGwDiameterAddress ]
 properties:
    ipSmGwMapAddress:
     $ref: '#/components/schemas/E164Number'
    ipSmGwDiameterAddress:
     $ref: '#/components/schemas/NetworkNodeDiameterAddress'
    unriIndicator:
      type: boolean
     default: false
AmfDeregInfo:
  type: object
  required:
     - deregReason
 properties:
    deregReason:
      $ref: '#/components/schemas/DeregistrationReason'
LocationInfo:
  type: object
  required:
    - registrationLocationInfoList
 properties:
    supi:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
    registrationLocationInfoList:
      type: array
      items:
        $ref: '#/components/schemas/RegistrationLocationInfo'
     minItems: 1
     maxItems: 2
    supportedFeatures:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
RegistrationLocationInfo:
  type: object
  required:
    - amfInstanceId
    - accessTypeList
 properties:
    amfInstanceId:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    plmnId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    vgmlcAddress:
      $ref: '#/components/schemas/VgmlcAddress'
    accessTypeList:
     type: array
      items:
```

```
$ref: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
         minItems: 1
         maxItems: 2
    VgmlcAddress:
     type: object
     properties:
        vgmlcAddressIpv4:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        vgmlcAddressIpv6:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Addr'
        vamlcFadn:
            $ref: 'TS29510_Nnrf_NFManagement.yaml#/components/schemas/Fqdn'
    PeiUpdateInfo:
      type: object
      required:
        - pei
     properties:
       pei:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Pei'
    RegistrationDatasetNames:
      type: array
      items:
       $ref: '#/components/schemas/RegistrationDataSetName'
     minItems: 2
     uniqueItems: true
    RegistrationDataSets:
      type: object
      properties:
        amf3Gpp:
         $ref: '#/components/schemas/Amf3GppAccessRegistration'
        amfNon3Gpp:
         $ref: '#/components/schemas/AmfNon3GppAccessRegistration'
        smfRegistration:
         $ref: '#/components/schemas/SmfRegistrationInfo'
        smsf3Gpp:
         $ref: '#/components/schemas/SmsfRegistration'
        smsfNon3Gpp:
         $ref: '#/components/schemas/SmsfRegistration'
# SIMPLE TYPES:
    PurgeFlag:
     type: boolean
    E164Number:
     type: string
      pattern: '^[0-9]{1,15}$'
    DualRegistrationFlag:
     type: boolean
# ENUMS:
    ImsVoPs:
      anyOf:
        - type: string
         enum:
          - HOMOGENEOUS_SUPPORT
          - HOMOGENEOUS_NON_SUPPORT
          - NON_HOMOGENEOUS_OR_UNKNOWN
        - type: string
    DeregistrationReason:
      anyOf:
        - type: string
          - UE_INITIAL_REGISTRATION
          - UE_REGISTRATION_AREA_CHANGE
         - SUBSCRIPTION_WITHDRAWN
         - 5GS_TO_EPS_MOBILITY
          - 5GS_TO_EPS_MOBILITY_UE_INITIAL_REGISTRATION
          - REREGISTRATION_REQUIRED
          - SMF_CONTEXT_TRANSFERRED
```

```
- type: string
RegistrationReason:
  anyOf:
     - type: string
     enum:
      - SMF_CONTEXT_TRANSFERRED
    - type: string
RegistrationDataSetName:
  anyOf:
    - type: string
      enum:
      - AMF_3GPP
      - AMF_NON_3GPP
     - SMF_PDU_SESSIONS
      - SMSF_3GPP
      - SMSF_NON_3GPP
    - type: string
```

## A.4 Nudm\_UEAU API

```
openapi: 3.0.0
info:
  version: '1.1.2'
  title: 'Nudm_UEAU'
  description: |
    UDM UE Authentication Service.
    © 2020, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
   All rights reserved.
externalDocs:
  description: 3GPP TS 29.503 Unified Data Management Services, version 16.6.0
  url: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.503/
servers:
  - url: '{apiRoot}/nudm-ueau/v1'
   variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause clause 4.4 of 3GPP TS 29.501.
security:
  - oAuth2ClientCredentials:
    - nudm-ueau
  - {}
  /{supiOrSuci}/security-information/generate-auth-data:
      summary: Generate authentication data for the UE
      operationId: GenerateAuthData
      tags:
        - Generate Auth Data
      parameters:
        - name: supiOrSuci
          in: path
          description: SUPI or SUCI of the user
          required: true
           $ref: 'TS29571_CommonData.yaml#/components/schemas/SupiOrSuci'
      requestBody:
        content:
          application/json:
              $ref: '#/components/schemas/AuthenticationInfoRequest'
       required: true
      responses:
          description: Expected response to a valid request
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/AuthenticationInfoResult'
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
```

```
'403':
       $ref: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      '500':
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '501':
       $ref: 'TS29571_CommonData.yaml#/components/responses/501'
      '503':
       $ref: 'TS29571_CommonData.yaml#/components/responses/503'
      default:
       description: Unexpected error
/{supiOrSuci}/security-information-rg:
 get:
   summary: Get authentication data for the FN-RG
   operationId: GetRgAuthData
   tags:
      - Get Auth Data for FN-RG
   parameters:
      - name: supiOrSuci
       in: path
       description: SUPI or SUCI of the user
       required: true
       schema:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/SupiOrSuci'
      - name: authenticated-ind
       in: query
       description: Authenticated indication
       required: true
       schema:
          $ref: '#/components/schemas/AuthenticatedInd'
      - name: supported-features
       in: querv
       description: Supported Features
       schema:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
      - name: plmn-id
       in: query
       description: serving PLMN ID
         application/json:
            schema:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
      - name: If-None-Match
       in: header
       description: Validator for conditional requests, as described in RFC 7232, 3.2
       schema:
          type: string
      - name: If-Modified-Since
       in: header
       description: Validator for conditional requests, as described in RFC 7232, 3.3
       schema:
         type: string
   responses:
      '200':
       description: Expected response to a valid request
         application/json:
           schema:
              $ref: '#/components/schemas/RgAuthCtx'
      '400':
       $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      '403':
       $ref: 'TS29571_CommonData.yaml#/components/responses/403'
      '404':
       $ref: 'TS29571_CommonData.yaml#/components/responses/404'
       $ref: 'TS29571_CommonData.yaml#/components/responses/500'
      '503':
        $ref: 'TS29571_CommonData.yaml#/components/responses/503'
       description: Unexpected error
/{supi}/auth-events:
   summary: Create a new confirmation event
   operationId: ConfirmAuth
```

```
tags:
        - Confirm Auth
      parameters:
        - name: supi
          in: path
          description: SUPI of the user
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
      requestBody:
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/AuthEvent'
        required: true
      responses:
        '201':
          description: Expected response to a valid request
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/AuthEvent'
          headers:
            Location:
              description: 'Contains the URI of the newly created resource, according to the
structure: {apiRoot}/nudm-ueau/v1/{supi}/auth-events/{authEventId}'
              required: true
              schema:
                type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{supi}/hss-security-information/{hssAuthType}/generate-av:
    post:
      summary: Generate authentication data for the UE in EPS or IMS domain
      operationId: GenerateAv
      tags:
        - Generate HSS Authentication Vectors
      parameters:
        - name: supi
          in: path
          description: SUPI of the user
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: hssAuthType
          in: path
          description: Type of AV requested by HSS
          required: true
            $ref: '#/components/schemas/HssAuthTypeInUri'
      request.Body:
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/HssAuthenticationInfoRequest'
        required: true
      responses:
        '200':
          description: Expected response to a valid request
          content:
            application/json:
                $ref: '#/components/schemas/HssAuthenticationInfoResult'
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
```

```
500:
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '501':
         $ref: 'TS29571_CommonData.yaml#/components/responses/501'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
       default:
         description: Unexpected error
  /{supi}/auth-events/{authEventId}:
   put:
     summary: Deletes the authentication result in the UDM
      operationId: DeleteAuth
      tags:
        - Delete Auth
     parameters:
        - name: supi
         in: path
         description: SUPI of the user
         required: true
         schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: authEventId
         in: path
         description: authEvent Id
         required: true
         schema:
           type: string
     requestBody:
       content:
         application/json:
           schema:
              $ref: '#/components/schemas/AuthEvent'
       required: true
      responses:
        '204':
         description: Expected response to a successful authentication result removal
         $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
         $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        503:
         $ref: 'TS29571_CommonData.yaml#/components/responses/503'
       default:
         $ref: 'TS29571_CommonData.yaml#/components/responses/default'
components:
 securitySchemes:
   oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
         tokenUrl: '{nrfApiRoot}/oauth2/token'
         scopes:
           nudm-ueau: Access to the nudm-ueau API
 schemas:
# COMPLEX TYPES:
   AuthenticationInfoRequest:
      type: object
     required:
        - servingNetworkName
        - ausfInstanceId
     properties:
       supportedFeatures:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
       servingNetworkName:
         $ref: '#/components/schemas/ServingNetworkName'
       resynchronizationInfo:
         $ref: '#/components/schemas/ResynchronizationInfo'
         $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
       cellCagInfo:
```

```
type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/CagId'
     minItems: 1
    n5gcInd:
     type: boolean
     default: false
AuthenticationInfoResult:
  type: object
 required:
    - authType
 properties:
   authType:
     $ref: '#/components/schemas/AuthType'
    supportedFeatures:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    authenticationVector:
     $ref: '#/components/schemas/AuthenticationVector'
    supi:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
AuthenticationVector:
  oneOf:
    - $ref: '#/components/schemas/AvEapAkaPrime'
    - $ref: '#/components/schemas/Av5GHeAka'
 discriminator:
   propertyName: avType
    mapping:
      5G_HE_AKA: '#/components/schemas/Av5GHeAka'
      EAP_AKA_PRIME: '#/components/schemas/AvEapAkaPrime'
AvEapAkaPrime:
  type: object
  required:

    avType

    - rand
    - xres
   - autn
    - ckPrime
    - ikPrime
 properties:
    avType:
     $ref: '#/components/schemas/AvType'
     $ref: '#/components/schemas/Rand'
    xres:
     $ref: '#/components/schemas/Xres'
    autn:
     $ref: '#/components/schemas/Autn'
    ckPrime:
     $ref: '#/components/schemas/CkPrime'
    ikPrime:
     $ref: '#/components/schemas/IkPrime'
Av5GHeAka:
  type: object
  required:
   - avType
- rand
    - xresStar
    - autn
    - kausf
 properties:
    avType:
     $ref: '#/components/schemas/AvType'
    rand:
     $ref: '#/components/schemas/Rand'
    xresStar:
     $ref: '#/components/schemas/XresStar'
     $ref: '#/components/schemas/Autn'
    kausf:
     $ref: '#/components/schemas/Kausf'
ResynchronizationInfo:
  type: object
  required:
```

```
- rand
    - auts
 properties:
    rand:
     $ref: '#/components/schemas/Rand'
     $ref: '#/components/schemas/Auts'
AuthEvent:
 type: object
 required:
   - nfInstanceId
- success
    - timeStamp
    - authType
    - servingNetworkName
  properties:
    nfInstanceId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
    success:
     $ref: '#/components/schemas/Success'
    timeStamp:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    authType:
     $ref: '#/components/schemas/AuthType'
    servingNetworkName:
     $ref: '#/components/schemas/ServingNetworkName'
    authRemovalInd:
     type: boolean
     default: false
RgAuthCtx:
  type: object
  required:

    authInd

  properties:
   authInd:
     type: boolean
     default: false
    supi:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
    supportedFeatures:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
HssAuthenticationInfoRequest:
  type: object
  required:
    - hssAuthType
    - numOfRequestedVectors
  properties:
   supportedFeatures:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
   hssAuthType:
     $ref: '#/components/schemas/HssAuthType'
    numOfRequestedVectors:
     $ref: '#/components/schemas/NumOfRequestedVectors'
    requestingNodeType:
     $ref: '#/components/schemas/NodeType'
    servingNetworkId:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
    resynchronizationInfo:
     $ref: '#/components/schemas/ResynchronizationInfo'
     $ref: '#/components/schemas/AccessNetworkId'
HssAuthenticationInfoResult:
  type: object
  required:
    - hssAuthenticationVectors
 properties:
   supportedFeatures:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
   hssAuthenticationVectors:
      $ref: '#/components/schemas/HssAuthenticationVectors'
HssAuthenticationVectors:
  oneOf:
```

```
- type: array
         items:
            $ref: '#/components/schemas/AvEpsAka'
         minItems: 1
         maxItems: 5
        - type: array
         items:
            $ref: '#/components/schemas/AvImsGbaEapAka'
         minItems: 1
         maxItems: 5
        - type: array
         items:
            $ref: '#/components/schemas/AvEapAkaPrime'
         minItems: 1
         maxItems: 5
    AvEpsAka:
      type: object
      required:
       - avType
       - rand
       - xres
        - kasme
     properties:
       avType:
         $ref: '#/components/schemas/HssAvType'
         $ref: '#/components/schemas/Rand'
       xres:
         $ref: '#/components/schemas/Xres'
        autn:
         $ref: '#/components/schemas/Autn'
       kasme:
         $ref: '#/components/schemas/Kasme'
    AvImsGbaEapAka:
      type: object
      required:
       - avType
        - rand
        - xres
        - autn
       - ck
       - ik
     properties:
        avType:
         $ref: '#/components/schemas/HssAvType'
        rand:
         $ref: '#/components/schemas/Rand'
       xres:
         $ref: '#/components/schemas/Xres'
        autn:
         $ref: '#/components/schemas/Autn'
         $ref: '#/components/schemas/ConfidentialityKey'
        ik:
          $ref: '#/components/schemas/IntegrityKey'
# SIMPLE TYPES:
    Autn:
     type: string
     pattern: '^[A-Fa-f0-9]{32}$'
     type: string
     pattern: '^[A-Fa-f0-9]{28}$'
    CkPrime:
     type: string
     pattern: '^[A-Fa-f0-9]{32}$'
    IkPrime:
     type: string
     pattern: '^[A-Fa-f0-9]{32}$'
```

```
Kausf:
     type: string
     pattern: '^[A-Fa-f0-9]{64}$'
     type: string
     pattern: '^[A-Fa-f0-9]{32}$'
   Xres:
     type: string
     pattern: '^[A-Fa-f0-9]{8,32}$'
   XresStar:
     type: string
     pattern: '^[A-Fa-f0-9]{32}$'
   ServingNetworkName:
     type: string
     pattern: '^5G:mnc[0-9]{3}[.]mcc[0-9]{3}[.]3gppnetwork[.]org(:[A-F0-9]{11})?$'
   Success:
     type: boolean
   AuthenticatedInd:
     type: boolean
   ConfidentialityKey:
     type: string
     pattern: '^[A-Fa-f0-9]{32}$'
   IntegrityKey:
     type: string
     pattern: '^[A-Fa-f0-9]{32}$'
   Kasme:
     type: string
     pattern: '^[A-Fa-f0-9]{64}$'
   NumOfRequestedVectors:
     type: integer
     minimum: 1
     maximum: 5
# ENUMS:
   AuthType:
     anyOf:
        - type: string
         enum:
         - 5G_AKA
         - EAP_AKA_PRIME
         - EAP_TLS
        - type: string
   AvType:
      anyOf:
        - type: string
         enum:
         - 5G HE AKA
         - EAP_AKA_PRIME
        - type: string
   HssAuthType:
     anyOf:
        - type: string
         enum:
         - EPS_AKA
         - EAP_AKA
         - EAP_AKA_PRIME
         - IMS_AKA
         - GBA_AKA
          - UMTS_AKA
        - type: string
   HssAvType:
     anyOf:
       - type: string
```

```
enum:
      - EPS_AKA
      - EAP_AKA
      - IMS_AKA
      - GBA_AKA
      - UMTS_AKA
    - type: string
HssAuthTypeInUri:
  anyOf:
    - type: string
     enum:
      - eps-aka
      - eap-aka
      - eap-aka-prime
      - ims-aka
      - gba-aka
    - type: string
AccessNetworkId:
  anyOf:
    - type: string
     enum:
      - HRPD
      - WIMAX
      - WLAN
      - ETHERNET
    - type: string
NodeType:
  anyOf:
    - type: string
     enum:
      - AUSF
      - VLR
      - SGSN
     - S_CSCF
     - BSF
     - GAN_AAA_SERVER
      - WLAN_AAA_SERVER
      - MME
    - type: string
```

## A.5 Nudm\_EE API

```
openapi: 3.0.0
info:
 version: '1.1.1' title: 'Nudm_EE'
  description:
    Nudm Event Exposure Service.
    © 2020, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
externalDocs:
 description: 3GPP TS 29.503 Unified Data Management Services, version 16.6.0
 url: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.503/
  - url: '{apiRoot}/nudm-ee/v1'
   variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause clause 4.4 of 3GPP TS 29.501.
security:
  - oAuth2ClientCredentials:
   - nudm-ee
  - {}
paths:
  /{ueIdentity}/ee-subscriptions:
      summary: Subscribe
      operationId: CreateEeSubscription
```

```
tags:
        - Create EE Subscription
      parameters:
        - name: ueIdentity
          in: path
          description: Represents the scope of the UE for which the subscription is applied.
Contains the GPSI of the user or the external group ID or any UE.
          required: true
          schema:
            pattern: '^(msisdn-[0-9]{5,15}|.+|extid-[^@]+@[^@]+|extgroupid-[^@]+@[^@]+|anyUE)$'
      requestBody:
        content:
          application/json:
            schema:
             $ref: '#/components/schemas/EeSubscription'
        required: true
      responses:
        '201':
          description: Expected response to a valid request
          content:
            application/json:
              schema:
               $ref: '#/components/schemas/CreatedEeSubscription'
          headers:
            Location:
              description: 'Contains the URI of the newly created resource, according to the
structure: {apiRoot}/nudm-ee/v1/{ueIdentity}/ee-subscriptions/{subscriptionId}'
              required: true
              schema:
                type: string
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '501':
          $ref: 'TS29571_CommonData.yaml#/components/responses/501'
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
      callbacks:
        eventOccurrenceNotification:
          '{request.body#/callbackReference}':
            post:
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      type: array
                      items:
                        $ref: '#/components/schemas/MonitoringReport'
                      minItems: 1
              responses:
                '204':
                  description: Successful Notification response
                '400':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/400'
                '404':
                  $ref: 'TS29571_CommonData.yaml#/components/responses/404'
                500:
                  $ref: 'TS29571_CommonData.yaml#/components/responses/500'
                  $ref: 'TS29571_CommonData.yaml#/components/responses/503'
                default:
                  description: Unexpected error
  /{ueIdentity}/ee-subscriptions/{subscriptionId}:
    delete:
      summary: Unsubscribe
      operationId: DeleteEeSubscription
      tags:
        - Delete EE Subscription
```

```
parameters:
        - name: ueIdentity
         in: path
         description: Represents the scope of the UE for which the subscription is applied.
Contains the GPSI of the user or the external group ID or any UE.
         required: true
         schema:
            type: string
            pattern: '^(msisdn-[0-9]{5,15}|.+|extid-[^@]+|extgroupid-[^@]+|enyUE)$'
        - name: subscriptionId
         in: path
         description: Id of the EE Subscription
         required: true
          schema:
           type: string
      responses:
        '204':
         description: Successful response
        '400':
         $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
         $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
         $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        503:
         $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
         description: Unexpected error
   patch:
      summary: Patch
      operationId: UpdateEeSubscription
      tags:
        - Update EE Subscription
      parameters:
        - name: ueIdentity
          in: path
         description: Represents the scope of the UE for which the subscription is applied.
Contains the GPSI of the user or the external group ID or any UE.
         required: true
         schema:
            type: string
           pattern: '^(msisdn-[0-9]{5,15}|.+|extid-[^@]+@[^@]+|extgroupid-[^@]+@[^@]+|anyUE)$'
        - name: subscriptionId
          in: path
         description: Id of the EE Subscription
         required: true
         schema:
            type: string
        - name: supported-features
         in: query
         description: Features required to be supported by the target NF
         schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
      requestBody:
        content:
         application/json-patch+json:
            schema:
              type: array
                $ref: 'TS29571 CommonData.yaml#/components/schemas/PatchItem'
              minItems: 1
        required: true
      responses:
         description: Expected response to a valid request
          content:
            application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/PatchResult'
        12041:
          description: Successful response
         $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
         description: Unexpected error
```

```
components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{nrfApiRoot}/oauth2/token'
          scopes:
            nudm-ee: Access to the nudm-ee API
  schemas:
# COMPLEX TYPES:
    CreatedEeSubscription:
      type: object
      required:
        - eeSubscription
      properties:
        eeSubscription:
            $ref: '#/components/schemas/EeSubscription'
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Uinteger'
        eventReports:
            type: array
            items:
              $ref: '#/components/schemas/MonitoringReport'
            minItems: 1
        epcStatusInd:
          type: boolean
    EeSubscription:
      type: object
      required:
         - callbackReference
        - monitoringConfigurations
      properties:
        callbackReference:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
        monitoringConfigurations:
         description: A map (list of key-value pairs where ReferenceId serves as key) of
MonitoringConfigurations
          type: object
          additionalProperties:
            $ref: '#/components/schemas/MonitoringConfiguration'
          minProperties: 1
        reportingOptions:
          $ref: '#/components/schemas/ReportingOptions'
        supportedFeatures:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
        subscriptionId:
          type: string
        contextInfo:
         $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/ContextInfo'
        epcAppliedInd:
          type: boolean
          default: false
        scefDiamHost:
          $ref: 'TS29571 CommonData.yaml#/components/schemas/DiameterIdentity'
        scefDiamRealm:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DiameterIdentity'
        notifyCorrelationId:
          type: string
    MonitoringConfiguration:
      type: object
      required:
        - eventType
      properties:
        eventType:
         $ref: '#/components/schemas/EventType'
        \verb|immediateFlag|:
          type: boolean
        locationReportingConfiguration:
          $ref: '#/components/schemas/LocationReportingConfiguration'
        associationType:
```

```
$ref: '#/components/schemas/AssociationType'
    datalinkReportCfg:
     $ref: '#/components/schemas/DatalinkReportingConfiguration'
    lossConnectivityCfg:
      $ref: '#/components/schemas/LossConnectivityCfg'
    maximumLatency:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
    maximumResponseTime:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
    suggestedPacketNumDl:
     type: integer
     minimum: 1
    {\tt pduSessionStatusCfg:}
     $ref: '#/components/schemas/PduSessionStatusCfg'
    reachabilityForSmsCfg:
     $ref: '#/components/schemas/ReachabilityForSmsConfiguration'
    mtcProviderInformation:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/MtcProviderInformation'
    afId:
     type: string
LossConnectivityCfg:
  type: object
 properties:
   maxDetectionTime:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
LocationReportingConfiguration:
 type: object
  required:
    - currentLocation
 properties:
   currentLocation:
     type: boolean
   oneTime:
     type: boolean
    accuracy:
   $ref: '#/components/schemas/LocationAccuracy'
    n3gppAccuracy:
     $ref: '#/components/schemas/LocationAccuracy'
ReportingOptions:
  type: object
  properties:
   reportMode:
     $ref: '#/components/schemas/EventReportMode'
    maxNumOfReports:
     $ref: '#/components/schemas/MaxNumOfReports'
    expiry:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    samplingRatio:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/SamplingRatio'
    quardTime:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
    reportPeriod:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
MonitoringReport:
  type: object
  required:
    - referenceId
    - eventType
    - timeStamp
  properties:
    referenceId:
     $ref: '#/components/schemas/ReferenceId'
    eventType:
     $ref: '#/components/schemas/EventType'
    report:
     $ref: '#/components/schemas/Report'
    reachabilityForSmsReport:
     $ref: '#/components/schemas/ReachabilityForSmsReport'
    gpsi:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
```

```
Report:
 oneOf:
    - - $ref: '#/components/schemas/ChangeOfSupiPeiAssociationReport'
    - $ref: '#/components/schemas/RoamingStatusReport'
    - $ref: '#/components/schemas/CnTypeChangeReport'
    - $ref: '#/components/schemas/CmInfoReport'
ReachabilityForSmsReport:
  type: object
  required:
   - smsfAccessType
 properties:
    smsfAccessType:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
    maxAvailabilityTime:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
ChangeOfSupiPeiAssociationReport:
  type: object
 required:
    - newPei
 properties:
    newPei:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Pei'
RoamingStatusReport:
  type: object
  required:
    - roaming
    - newServingPlmn
 properties:
   roaming:
     type:
        boolean
    newServingPlmn:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
CnTypeChangeReport:
  type: object
  required:
    - newCnType
 properties:
   newCnType:
     $ref: '#/components/schemas/CnType'
    \verb"oldCnType":
      $ref: '#/components/schemas/CnType'
DatalinkReportingConfiguration:
  type: object
  properties:
    dddTrafficDes:
     type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DddTrafficDescriptor'
     minItems: 1
    dnn:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
    slice:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
    dddStatusList:
     type: array
      items:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/DlDataDeliveryStatus'
      minItems: 1
CmInfoReport:
  type: object
 properties:
   oldCmInfoList:
      type: array
      items:
        $ref: 'TS29518_Namf_EventExposure.yaml#/components/schemas/CmInfo'
     minItems: 1
     maxItems: 2
    newCmInfoList:
      type: array
        $ref: 'TS29518_Namf_EventExposure.yaml#/components/schemas/CmInfo'
     minItems: 1
```

```
maxItems: 2
      required:
        - newCmInfoList
    PduSessionStatusCfg:
      type: object
      properties:
        dnn:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
# SIMPLE TYPES:
   ReferenceId:
      type: integer
   MaxNumOfReports:
      type: integer
# ENUMS:
    ReachabilityForSmsConfiguration:
      anyOf:
        - type: string
          enum:
          - REACHABILITY_FOR_SMS_OVER_NAS
          - REACHABILITY_FOR_SMS_OVER_IP
        - type: string
    EventType:
      anyOf:
        - type: string
         enum:
          - LOSS_OF_CONNECTIVITY
          - UE_REACHABILITY_FOR_DATA
          - UE_REACHABILITY_FOR_SMS
          - LOCATION_REPORTING
          - CHANGE_OF_SUPI_PEI_ASSOCIATION
          - ROAMING_STATUS
          - COMMUNICATION_FAILURE
          - AVAILABILITY_AFTER_DDN_FAILURE
          - CN_TYPE_CHANGE
          - DL_DATA_DELIVERY_STATUS
          - PDN_CONNECTIVITY_STATUS
          - UE_CONNECTION_MANAGEMENT_STATE
        - type: string
    LocationAccuracy:
      anyOf:
        - type: string
         enum:
          - CELL_LEVEL
          - TA_LEVEL
          - N3IWF_LEVEL
          - UE_IP
          - UE_PORT
        - type: string
    CnType:
      anyOf:
        - type: string
         enum:
          - SINGLE_4G
          - SINGLE_5G
          - DUAL_4G5G
        - type: string
    AssociationType:
      anyOf:
        - type: string
          enum:
          - IMEI_CHANGE
          - IMEISV_CHANGE
        - type: string
    EventReportMode:
      anyOf:
       - type: string
```

- enum:
   PERIODIC
   ON\_EVENT\_DETECTION
   type: string

## A.6 Nudm PP API

```
openapi: 3.0.0
info:
  version: '1.1.2'
 title: 'Nudm_PP'
  description: |
   Nudm Parameter Provision Service.
    © 2020, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
   All rights reserved.
externalDocs:
  description: 3GPP TS 29.503 Unified Data Management Services, version 16.6.0
  url: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.503/'
  - url: '{apiRoot}/nudm-pp/v1'
   variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause clause 4.4 of 3GPP TS 29.501.
security:
  - oAuth2ClientCredentials:
    - nudm-pp
  - {}
paths:
  /{ueId}/pp-data:
   patch:
      summary: provision parameters
      operationId: Update
      tags:
         - Subscription Data Update
      parameters:
        - name: ueId
          in: path
          description: Identifier of the UE
          required: true
          schema:
            anyOf:
              - - $ref: 'TS29571_CommonData.yaml#/components/schemas/VarUeId'
              - - $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/ExtGroupId'
        - name: supported-features
          in: querv
          description: Features required to be supported by the target NF
            $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
      requestBody:
        content:
          application/merge-patch+json:
            schema:
              $ref: '#/components/schemas/PpData'
        required: true
      responses:
        '200':
          description: Expected response to a valid request
          content:
            application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/PatchResult'
        '204':
          description: Expected response to a valid request
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        503:
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /5g-vn-groups/{extGroupId}:
```

```
put:
  summary: create a 5G VN Group
  operationId: Create 5G VN Group
  tags:
    - 5G VN Group Creation
  parameters:
    - name: extGroupId
      in: path
      description: External Identifier of the Group
      required: true
      schema:
        $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/ExtGroupId'
  requestBody:
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/5GVnGroupConfiguration'
    required: true
  responses:
    '201':
      description: Expected response to a valid request
    '400':
      $ref: 'TS29571_CommonData.yaml#/components/responses/400'
      $ref: 'TS29571 CommonData.yaml#/components/responses/403'
    '404':
      $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      $ref: 'TS29571_CommonData.yaml#/components/responses/500'
    503:
      $ref: 'TS29571_CommonData.yaml#/components/responses/503'
    default:
      description: Unexpected error
delete:
  summary: delete a 5G VN Group
  operationId: Delete 5G VN Group
  tags:
    - 5G VN Group Deletion
  parameters:
    - name: extGroupId
      in: path
      description: External Identifier of the Group
      required: true
      schema:
        $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/ExtGroupId'
  responses:
     204:
      description: Expected response to a valid request
    '400':
      $ref: 'TS29571_CommonData.yaml#/components/responses/400'
    '403':
      $ref: 'TS29571_CommonData.yaml#/components/responses/403'
    '404':
      $ref: 'TS29571_CommonData.yaml#/components/responses/404'
      $ref: 'TS29571_CommonData.yaml#/components/responses/500'
     503:
      $ref: 'TS29571_CommonData.yaml#/components/responses/503'
    default:
     description: Unexpected error
patch:
  summary: modify a 5G VN Group
  operationId: Modify 5G VN Group
  tags:
    - 5G VN Group Modification
  parameters:
    - name: extGroupId
     in: path
      description: External Identifier of the group
      required: true
        $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/ExtGroupId'
    - name: supported-features
      in: query
      description: Features required to be supported by the target NF
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  requestBody:
```

```
content:
          application/merge-patch+json:
            schema:
              $ref: '#/components/schemas/5GVnGroupConfiguration'
        required: true
      responses:
         204':
          description: Expected response to a valid request
        '200':
          description: Expected response to a valid request
          content:
            application/json:
              schema:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/PatchResult'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
      summary: get 5G VN Group
      operationId: Get 5G VN Group
      tags:
        - 5G VN Group Modification
      parameters:
        - name: extGroupId
          in: path
          description: External Identifier of the group
          required: true
          schema:
            $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/ExtGroupId'
      responses:
        '200':
          description: Expected response to a valid request
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/5GVnGroupConfiguration'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        5001:
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        503:
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{nrfApiRoot}/oauth2/token'
          scopes:
            nudm-pp: Access to the nudm-pp API
  schemas:
# COMPLEX TYPES:
    PpData:
      type: object
     properties:
        communicationCharacteristics:
```

```
$ref: '#/components/schemas/CommunicationCharacteristics'
    supportedFeatures:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    \verb"expected UeBehaviour Parameters:
      $ref: '#/components/schemas/ExpectedUeBehaviour'
    ecRestriction:
     $ref: '#/components/schemas/EcRestriction'
    acsInfo:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/AcsInfoRm'
     $ref: 'TS29571_CommonData.yaml#/components/schemas/StnSrRm'
    lcsPrivacy:
     $ref: '#/components/schemas/LcsPrivacy'
    sorInfo:
     $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/SorInfo'
CommunicationCharacteristics:
  type: object
  properties:
   ppSubsRegTimer:
     $ref: '#/components/schemas/PpSubsRegTimer'
    ppActiveTime:
      $ref: '#/components/schemas/PpActiveTime'
    ppDlPacketCount:
     $ref: '#/components/schemas/PpDlPacketCount'
    ppDlPacketCountExt:
     $ref: '#/components/schemas/PpDlPacketCountExt'
    ppMaximumResponseTime:
     $ref: '#/components/schemas/PpMaximumResponseTime'
    ppMaximumLatency:
      $ref: '#/components/schemas/PpMaximumLatency'
PpSubsRegTimer:
  type: object
  required:
   - subsRegTimer
    - afInstanceId
    - referenceId
  properties:
    subsRegTimer:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
    afInstanceId:
      type: string
    referenceId:
     $ref: '#/components/schemas/ReferenceId'
    validityTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    mtcProviderInformation:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/MtcProviderInformation'
 nullable: true
PpActiveTime:
  type: object
  required:
    - activeTime
    - afInstanceId
    - referenceId
  properties:
    activeTime:
     $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
    afInstanceId:
     type: string
    referenceId:
     $ref: '#/components/schemas/ReferenceId'
    validityTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    mtcProviderInformation:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/MtcProviderInformation'
  nullable: true
5GVnGroupConfiguration:
  type: object
  properties:
    5gVnGroupData:
     $ref: '#/components/schemas/5GVnGroupData'
    members:
     type: array
```

```
$ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
         minItems: 1
       referenceId:
          $ref: '#/components/schemas/ReferenceId'
        afInstanceId:
         type: string
        internalGroupIdentifier:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
        mtcProviderInformation:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/MtcProviderInformation'
   5GVnGroupData:
      type: object
      required:
        - dnn
        - sNssai
      properties:
        dnn:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
        sNssai:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
        pduSessionTypes:
         type: array
         items:
           $ref: 'TS29571_CommonData.yaml#/components/schemas/PduSessionType'
         minItems: 1
        appDescriptors:
          type: array
         items:
            $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/AppDescriptor'
         minItems: 1
        secondaryAuth:
          type: boolean
        dnAaaAddress:
          $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/IpAddress'
   ExpectedUeBehaviour:
      type: object
      required:
        - afInstanceId
        - referenceId
     properties:
       afInstanceId:
         type: string
       referenceId:
         $ref: '#/components/schemas/ReferenceId'
        stationaryIndication:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/StationaryIndicationRm'
        communicationDurationTime:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSecRm'
        scheduledCommunicationType:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/ScheduledCommunicationTypeRm'
        periodicTime:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSecRm'
        scheduledCommunicationTime:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/ScheduledCommunicationTimeRm'
        expectedUmts:
          type: array
          items:
            $ref: '#/components/schemas/LocationArea'
          minItems: 1
         nullable: true
         description: Identifies the UE's expected geographical movement. The attribute is only
applicable in 5G.
        trafficProfile:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/TrafficProfileRm'
        batteryIndication:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/BatteryIndicationRm'
        validityTime:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        mtcProviderInformation:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/MtcProviderInformation'
   LocationArea:
      type: object
     properties:
       geographicAreas:
```

```
type: array
          items:
            $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/GeographicArea'
         minItems: 0
          description: Identifies a list of geographic area of the user where the UE is located.
        civicAddresses:
          type: array
          items:
            $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/CivicAddress'
         description: Identifies a list of civic addresses of the user where the UE is located.
        nwAreaInfo:
          $ref: '#/components/schemas/NetworkAreaInfo'
   NetworkAreaInfo:
     description: Describes a network area information in which the NF service consumer requests
the number of UEs.
      type: object
     properties:
       ecgis:
         description: Contains a list of E-UTRA cell identities.
          type: array
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Ecgi'
         minItems: 1
       ncgis:
         description: Contains a list of NR cell identities.
          type: array
         items:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Ncgi'
         minItems: 1
        qRanNodeIds:
         description: Contains a list of NG RAN nodes.
          type: array
          items:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/GlobalRanNodeId'
         minItems: 1
        tais:
          description: Contains a list of tracking area identities.
          type: array
           $ref: 'TS29571_CommonData.yaml#/components/schemas/Tai'
         minItems: 1
   EcRestriction:
      type: object
      required:
        - afInstanceId
       - referenceId
     properties:
       afInstanceId:
         type: string
        referenceId:
          $ref: '#/components/schemas/ReferenceId'
       plmnEcInfos:
         type: array
          items:
            $ref: '#/components/schemas/PlmnEcInfo'
         minItems: 1
       mtcProviderInformation:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/MtcProviderInformation'
   PlmnEcInfo:
      type: object
      required:
        - plmnId
     properties:
       plmnId:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        ecRestrictionDataWb:
          $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/EcRestrictionDataWb'
       ecRestrictionDataNb:
         type: boolean
         default: false
   PpDlPacketCountExt:
     type: object
```

```
required:
        - afInstanceId
        - referenceId
      properties:
       afInstanceId:
         type: string
       referenceId:
         $ref: '#/components/schemas/ReferenceId'
        validityTime:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
       mtcProviderInformation:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/MtcProviderInformation'
      nullable: true
   PpMaximumResponseTime:
      type: object
      required:
        - maximumResponseTime
        - afInstanceId
        - referenceId
     properties:
        maximumResponseTime:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
       afInstanceId:
         type: string
        referenceId:
         $ref: '#/components/schemas/ReferenceId'
        validityTime:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
       mtcProviderInformation:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/MtcProviderInformation'
      nullable: true
   PpMaximumLatency:
      type: object
      required:
       - maximumLatency
        - afInstanceId
       - referenceId
      properties:
       maximumLatency:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
       afInstanceId:
          type: string
       referenceId:
         $ref: '#/components/schemas/ReferenceId'
        validityTime:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        mtcProviderInformation:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/MtcProviderInformation'
     nullable: true
   LcsPrivacy:
      type: object
     properties:
       afInstanceId:
         type: string
        referenceId:
         $ref: '#/components/schemas/ReferenceId'
       lpi:
         $ref: 'TS29503_Nudm_SDM.yaml#/components/schemas/Lpi'
        mtcProviderInformation:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/MtcProviderInformation'
# SIMPLE TYPES:
   ReferenceId:
      type: integer
   PpDlPacketCount:
     type: integer
     nullable: true
```

# ENUMS:

#### A.7 Nudm\_NIDDAU API

```
openapi: 3.0.0
info:
    version: '1.0.1'
    title: 'Nudm_NIDDAU'
    description: |
        Nudm NIDD Authorization Service.
        © 2020, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
        All rights reserved.
externalDocs:
    description: 3GPP TS 29.503 Unified Data Management Services, version 16.6.0
    url: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.503/
servers:
    - url: '{apiRoot}/nudm-niddau/v1'
        variables:
            apiRoot:
                default: https://example.com
                description: apiRoot as defined in clause clause 4.4 of 3GPP TS 29.501.
security:
     - oAuth2ClientCredentials:

    nudm-niddau

    - {}
    /{ueIdentity}/authorize:
        post:
            summary: Authorize the NIDD configuration request.
             operationId: AuthorizeNiddData
            tags:
                 - Authorize the NIDD configuration request
             parameters:
                  - name: ueIdentity
                     in: path
                     description: Represents the scope of the UE for which the NIDD configuration are
authorized. Contains the GPSI of the user or the external group ID.
                     required: true
                     schema:
                         type: string
                         pattern: \c^{(msisdn-[0-9]\{5,15\}} \cdot + \c^{(msisdn-[0-9]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[^0]+0[
             requestBody:
                 content:
                    application/json:
                         schema:
                             $ref: '#/components/schemas/AuthorizationInfo'
                required: true
             responses:
                  '200':
                     description: Expected response to a valid request
                     content:
                         application/json:
                                  $ref: '#/components/schemas/AuthorizationData'
                 '400':
                     $ref: 'TS29571_CommonData.yaml#/components/responses/400'
                     $ref: 'TS29571 CommonData.vaml#/components/responses/403'
                  '404':
                     $ref: 'TS29571_CommonData.yaml#/components/responses/404'
                     $ref: 'TS29571_CommonData.yaml#/components/responses/500'
                  '501':
                     $ref: 'TS29571_CommonData.yaml#/components/responses/501'
                     $ref: 'TS29571_CommonData.yaml#/components/responses/503'
                 default:
                     description: Unexpected error
             callbacks:
                 niddAuthUpdateNotification:
                     '{request.body#/authUpdateCallbackUri}':
                         post:
```

```
requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/NiddAuthUpdateNotification'
              responses:
                '204':
                  description: Expected response to a valid request
components:
  securitySchemes:
   oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{nrfApiRoot}/oauth2/token'
          scopes:
            nudm-niddau: Access to the nudm-niddau API
  schemas:
# COMPLEX TYPES:
    AuthorizationData:
      type: object
      required:
      - authorizationData
      properties:
        authorizationData:
          type: array
          items:
            $ref: '#/components/schemas/UserIdentifier'
          minItems: 1
          uniqueItems: true
        validityTime:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    UserIdentifier:
      type: object
      required:
        - supi
      properties:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        gpsi:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
        validityTime:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
    NiddAuthUpdateInfo:
      type: object
      required:
        - authorizationData
      properties:
        authorizationData:
          $ref: '#/components/schemas/AuthorizationData'
        invalidityInd:
          type: boolean
    NiddAuthUpdateNotification:
      type: object
      required:
        - niddAuthUpdateInfoList
      properties:
        niddAuthUpdateInfoList:
          type: array
          items:
            $ref: '#/components/schemas/NiddAuthUpdateInfo'
          minItems: 1
    AuthorizationInfo:
      type: object
      required:
      - snssai
       - dnn
       - mtcProviderInformation
```

```
- authUpdateCallbackUri
properties:
snssai:
$ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
dnn:
$ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
mtcProviderInformation:
$ref: 'TS29571_CommonData.yaml#/components/schemas/MtcProviderInformation'
authUpdateCallbackUri:
$ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
afId:
type: string

# SIMPLE TYPES:
```

#### A.8 Nudm\_MT API

```
openapi: 3.0.0
info:
 version: '1.0.1'
  title: 'Nudm_MT'
  description:
   UDM MT Service.
   © 2020, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
   All rights reserved.
externalDocs:
  description: 3GPP TS 29.503 Unified Data Management Services, version 16.5.0
  url: 'http://www.3gpp.org/ftp/Specs/archive/29_series/29.503/'
  - url: '{apiRoot}/nudm-mt/v1'
   variables:
      apiRoot:
        default: https://example.com
       description: apiRoot as defined in clause clause 4.4 of 3GPP TS 29.501.
security:
  - oAuth2ClientCredentials:
    - nudm-mt
  - {}
paths:
  /{supi}:
   get:
      summary: Query Information for the UE
      operationId: QueryUeInfo
      tags:
       - Query UE Info
      parameters:
        - name: supi
         in: path
          description: Identifier of the UE
          required: true
          schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
        - name: fields
          in: query
         description: attributes to be retrieved
          required: true
          schema:
           type: array
           items:
             type: string
           minItems: 1
          style: form
          explode: false
        - name: supported-features
```

```
in: query
          description: Supported Features
         schema:
             $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
      responses:
        '200':
         description: Expected response to a valid request
         content:
            application/json:
             schema:
               $ref: '#/components/schemas/UeInfo'
        '400':
         $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '404':
         $ref: 'TS29571_CommonData.yaml#/components/responses/404'
         $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '501':
          $ref: 'TS29571_CommonData.yaml#/components/responses/501'
        '503':
         $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          description: Unexpected error
  /{supi}/loc-info/provide-loc-info:
    post:
     summary: Provides the UE's 5GS location information
      operationId: ProvideLocationInfo
      tags:
       - Provide UE Location
     parameters:
        - name: supi
         in: path
         description: Identifier of the UE
         required: true
         schema:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
     requestBody:
        content:
         application/json:
            schema:
              $ref: '#/components/schemas/LocationInfoRequest'
       required: true
      responses:
        '200':
         description: Expected response to a valid request
         content:
            application/json:
              schema:
                $ref: '#/components/schemas/LocationInfoResult'
        '400':
         $ref: 'TS29571_CommonData.yaml#/components/responses/400'
         404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '500':
         $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        501:
         $ref: 'TS29571_CommonData.yaml#/components/responses/501'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
         description: Unexpected error
components:
 securitySchemes:
   oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{nrfApiRoot}/oauth2/token'
          scopes:
            nudm-mt: Access to the nudm-mt API
 schemas:
# COMPLEX TYPES:
```

# ENUMS:

```
UeInfo:
      type: object
     properties:
       tadsInfo:
         $ref: 'TS29518_Namf_MT.yaml#/components/schemas/UeContextInfo'
         $ref: 'TS29518_Namf_EventExposure.yaml#/components/schemas/5GsUserState'
        5qSrvccInfo:
          $ref: '#/components/schemas/5GSrvccInfo'
   5GSrvccInfo:
      type: object
      required:
       - ue5GSrvccCapability
     properties:
       ue5GSrvccCapability:
         type: boolean
        stnSr:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/StnSr'
       cMsisdn:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/CMsisdn'
   LocationInfoRequest:
      type: object
     properties:
       req5gsLoc:
         type: boolean
         default: false
       reqCurrentLoc:
         type: boolean
         default: false
       reqRatType:
         type: boolean
         default: false
        reqTimeZone:
         type: boolean
         default: false
       reaServinaNode:
         type: boolean
         default: false
        supportedFeatures:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
   LocationInfoResult:
      type: object
     properties:
        vPlmnId:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        amfInstanceId:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        smsfInstanceId:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/NfInstanceId'
        ncgi:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Ncgi'
        ecgi:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Ecgi'
        tai:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/Tai'
       currentLoc:
         type: boolean
        geoInfo:
         $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/GeographicArea'
        locatoinAge:
         $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/AgeOfLocationEstimate'
        ratType:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/RatType'
        timezone:
         $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
        {\tt supportedFeatures:}
          $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
# SIMPLE TYPES:
```

## Annex B (informative): Stateless UDMs

Figure B-1 shows a scenario where the stateless UDM receives and processes a request from an NF.

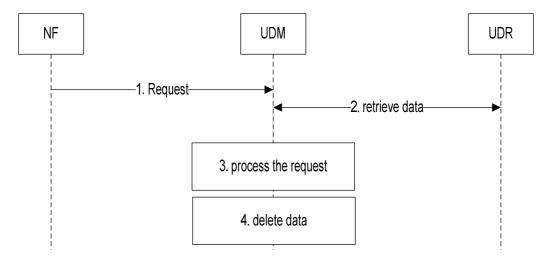


Figure B-1: Stateless UDM

- 1. The stateless UDM receives a request from an NF. This can be a request to perform an Nudm service, or a Notification that the UDM has previously subscribed to at the NF by means of a service the UDM consumes from the NF. In the later case the NF can be the UDR.
- 2. The UDM retrieves data from the UDR that are required to process the request. This step can be skipped if the request was a notification from the UDR and contained enough information so that the UDM can process the request.
- 3. The UDM processes the received request. This can include consuming services from other NFs, consuming services from the UDR (e.g. to update data or subscribe to notifications), and sending notifications to NFs that have subscribed at the UDM to receive notifications, and includes sending the response to the NF (all not shown in the figure).
- 4. The UDM locally deletes the data retrieved in step 2 and/or received in step 1.

Figure B-2 shows a scenario where an AMF subscribes to notifications of data change (permanent provisioned subscription data) at the stateless UDM. The UDM (UDM 1) stores the subscription to notification in the UE's context data at the UDR.

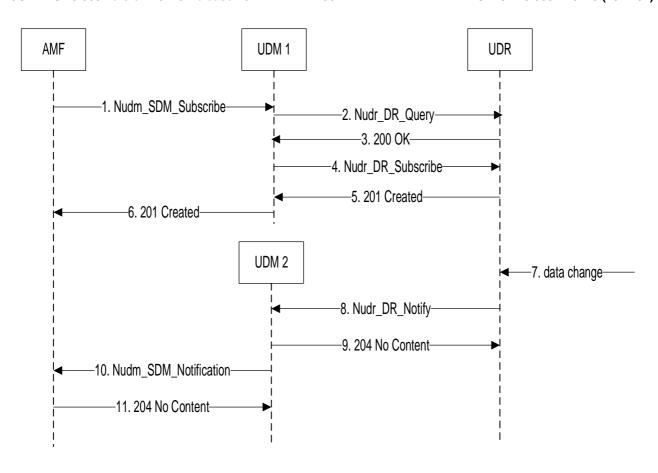


Figure B-2: Subscription to notification

- 1. The stateless UDM 1 receives a subscribe request from an AMF; see clause 5.2.2.3.2.
- 2.-3 The UDM retrieves UE context data from the UDR to be able to perform required plausibility checks; see 3GPP TS 29.504 [9] clause 5.2.2.2.2.
- 4. The UDM creates a new sdm subscription at the UDR; see 3GPP TS 29.504 [9] clause 5.2.2.6.3.
- 5. The UDR sends a 201 Created response containig a subscription ID
- 6. The UDM send a 201 Created response passing the subscription ID received in step 5 to the AMF.
- 7. Permanent provisioned Subscription data are modified at the UDR.
- 8. The UDR selects a suitable UDM and sends a Notification; see 3GPP TS 29.504 [9] clause 5.2.2.8. In addition to the data that have changed, the Notification request message can contain enough (unchanged) information (e.g. the information that has been created in step 4) allowing the UDM to perform step 10 without the need to additionally retrieve information from the UDR.
- 9. The UDM responds with 204 No Content.
- 10. The UDM notifies the AMF according to the callback URI of the AMF contained in the Notification received in step 8; see clause 5.2.2.5.2.
- 11. The AMF responds with 204 No Content.

Figure B-3 shows a scenario where an AMF registers at the stateless UDM. The UDM (UDM 1) stores the registration in the UE's context data at the UDR. The AMF then requests to update the registration e.g. due to change of PEI. This request is sent to UDM2 which belongs to the same UDM group as UDM1.

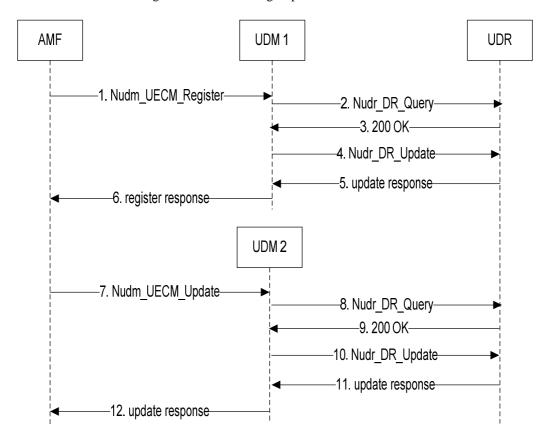


Figure B-3: AMF Registration and Update

- 1. The AMF discovers (by means of NRF query) and selects an UDM and sends the register request;
- 2.-3 The UDM retrieves UE context data from the UDR e.g. to be able to perform required plausibility checks;
- 4.-5 The UDM updates UE context data in the UDR. The UDM also performs other actions not shown in the figure, e.g deregister an old AMF, notify a subscribed NEF, ...
- 6. The UDM acknowldeges the AMF registration. The AMF stores the UDM group ID as discovered and selected in step 1. The UDM locally deletes the data retrieved in step 3.
- 7. The AMF sends an update request (e.g. change of PEI) to one of the available UDMs (UDM2) that belongs to the same UDM group as UDM1.
- 8.-9. The UDM retrieves UE context data from the UDR e.g. to be able to perform required plausibility checks;
- 10.-11.The UDM updates UE context data in the UDR.The UDM also performs other actions not shown in the figure, e.g. notify a subscribed NEF, ...
- 12. The UDM sends update response to the AMF and locally deletes the data retrieved in step 9.
- NOTE: When a previously received Location Header or Callback URI is used for a subsequent UDM contact, the authority part may need to be replaced to point to the selected UDM.

Figure B-4 shows a scenario where an AF requests a subscription for all UEs (any UE) for a given network event. The NEF discovers all UDM NFs providing the necessary service to perform a bulk subscription. If one or several UDM Group IDs are received, NEF selects only one instance of UDM for each Group ID in order to perform the bulk subscription.

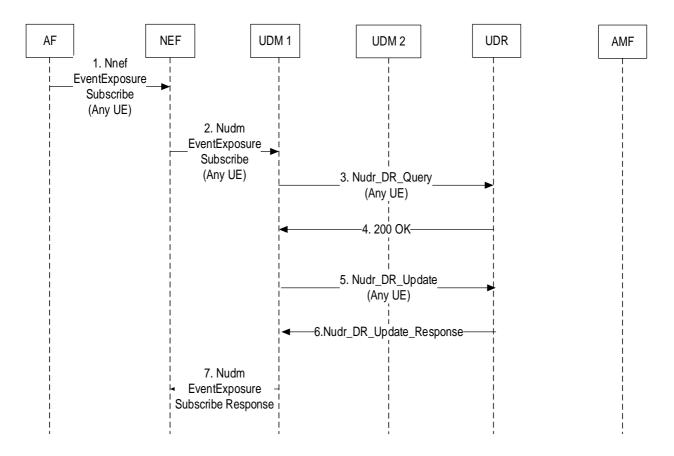


Figure B-4: Any UE Subscription

- 1. An AF subscribes to a network event (e.g. SUPI-PEI association change) for any UE (i.e. all UEs)
- 2. The NEF discovers (by means of NRF query) all UDM instances supporting the required service (e.g. nudm-ee). The NEF selects an UDM instance (e.g. UDM 1) from each UDM Group ID discovered (UDM 1 and UDM 2 are in the same UDM Group ID) and sends the subscribe request. The NEF also stores the UDM Group ID information to select a UDM for subsequent subscriptions.
- 3-4. The UDM retrieves data from the UDR for group of UEs, e.g. to be able to perform required plausibility checks
- 5-6. The UDM stores data for group of UEs in the UDR.
- 7. The UDM acknowldeges the NEF subscription request. The UDM locally deletes the data retrieved in step 3.

Steps 7-12 in Figure B-3 are performed. As result of the subscription, NEF is notified by UDM 2 (change of PEI). Subsequently, when the event occurs for any UE (within the SUPI range, if applicable, served by the UDM Group ID), NEF is notified by either UDM1 or UDM 2.

# Annex C (informative): SUCI encoding

The structure of the Subscription Concealed Identifier (SUCI) is defined in 3GPP TS 23.003 [8].

When SUCI needs to be sent as a character string (e.g. as a string in a JSON payload of any of the service operations defined in the APIs defined in this specification), the SUCI is composed as an UTF-8 character string, where the different components are separated by the "minus" character "-" (UTF-8 0x2D).

These components shall be formatted as follows:

- 1) SUPI Type: a single decimal digit, from 0 to 7, formatted as a single UTF-8 character (UTF-8 0x30 to 0x37)
- 2) Home Network Identifier.

When the SUPI Type is an IMSI, the Home Network Identifier consists on 2 components: MCC and MNC, separated by the "minus" character; these components are formatted as a string of 3 characters for MCC and a string of 2 or 3 characters for MNC (UTF-8 0x30 to 0x39).

When the SUPI type is a Network Specific Identifier, Global Line Identifier (GLI) or Global Cable Identifier (GCI) the Home Network Identifier consists of a string of characters with a variable length, formatted as an UTF-8 character string.

- 3) Routing Indicator, consisting of 1 to 4 decimal digits formatted as a string of 1 to 4 characters (UTF-8 0x30 to 0x39).
- 4) Protection Scheme Identifier, consisting in a value in the range of 0 to 15, representing a single hexadecimal digit, formatted as a single UTF-8 character (UTF-8 0x30 to 0x39, or 0x41 to 0x46, or 0x61 to 0x66).
- 5) Home Network Public Key Identifier, consisting in a value in the range 0 to 255, formatted as a sequence of 1 to 3 decimal digits, formatted of 1 to 3 UTF-8 characters (UTF-8 0x30 to 0x39).
- 6) Scheme Output, consisting of a string of UTF-8 characters with a variable length, or a sequence of hexadecimal digits, dependent on the used protection scheme. It represents the output of a public key protection scheme specified in Annex C of 3GPP TS 33.501 [6] or the output of a protection scheme specified by the HPLMN.

#### **EXAMPLES:**

SUPI is IMSI-based; MCC=123, MNC=45, MSIN: 0123456789

SUPI type: 0 (IMSI)

Routing Identifier: 012

Protection Scheme: 0 (NULL scheme)

Home Network Public Key Identifier: 0

Scheme output = MSIN (cleartext)

SUCI UTF-8 string:

" 0 - 123 - 45 - 012 - 0 - 0 - 0123456789 "

NOTE: According to 3GPP TS 33.501 [6] (see annex C.2) the NULL scheme returns the same output as the input (i.e. MSIN in this example), which can be packed BCD coded. However, when formatted as character string in JSON, the scheme output is expected to be reformatted from packed BCD (5 octets in this example) to a sequence of decimal digits in UTF-8 (10 characters in this example).

- SUPI is IMSI-based, MCC=123, MNC=45, MSIN: 9876543210 (coded as 10 hexadecimal digits using 5 octets packed BCD coding: 89, 67, 45, 23, 01)

SUPI type: 0 (IMSI)

Routing Identifier: 0002

Protection Scheme: 1 (Profile A)

Home Network Public Key Identifier: 17

Scheme output = ECC ephemeral public key (32 octets, first bolded part below) + Encrypted MSIN (where MSIN has 10 digits i.e. 5 octets coded as hexadecimal digits using packed BCD coding, italic part below) + MAC tag (8 octets, last bolded part below) = 50 octets = 100 hexadecimal characters (NOTE: the encrypted content below is fictitious).

SUCI UTF-8 string:

"0-123-45-0002-1-17-

 ${\tt e9b9916c911f448d8792e6b2f387f85d3ecab9040049427d9edbb5431b0bc711023be6a057b45d936238aebeb7"}$ 

SUPI is NAI-based, SUPI = alice@example.com

SUPI type = 1 (Network Specific Identifier)

Routing Identifier: 84

Protection Scheme: 2 (Profile B)

Home Network Public Key Identifier: 250

Scheme output = ECC ephemeral public key (33 octets, first bolded part below) + Encrypted username of NAI (5 octets, italic part below) + MAC tag (8 octets, last bolded part below) = 46 octets = 92 hexadecimal characters (NOTE: the encrypted content below is fictitious)

SUCI UTF-8 string:

"1-example.com-84-2-250-

e9b9916c911f448d8792e6b2f387f85d3ecab9040049427d9edbb5431b0bc71195023be6a057b45d936238aebeb7"

- SUPI is NAI-based; SUPI = 00-00-5E-00-53-00@operator.com

SUPI type: 3 (GCI)

Routing Identifier: 012

Protection Scheme: 0 (NULL scheme)

Home Network Public Key Identifier: 0

Scheme output = 00-00-5E-00-53-00 (cleartext)

SUCI UTF-8 string:

"3-operator.com-012-0-0-00-5E-00-53-00"

# Annex D (informative): Change history

						Change history	
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New
2017-10	CT4#80	C4-175320				TS skeleton	<b>version</b> 0.1.0
2017-10	CT4#80	C4-175362				Implementation of pCRs agreed at CT4#80.	0.2.0
2017-12	CT4#81	C4-176150				Implementation of pCRs agreed at CT4#81	0.3.0
2017 12	011//01	C4-176153				Important of porto agreed at or mor	0.0.0
		C4-176423					
		C4-176365					
		C4-176424					
		C4-176425					
2018-01	CT4#82	C4-181277				Implementation of pCRs agreed at CT4#82	0.4.0
		C4-181278 C4-181239					
		C4-181241					
		C4-181245					
		C4-181280					
		C4-181282					
		C4-181131					
		C4-181247					
		C4-181284					
		C4-181250					
		C4-181273 C4-181252					
		C4-181254					
2018-03	CT4#83	C4-182178				Implementation of pCRs agreed at CT4#83	0.5.0
2010 00	0111100	C4-182270				Important of porto agreed at or mee	0.0.0
		C4-182354					
		C4-182352					
		C4-182274					
		C4-182400					
		C4-182402					
		C4-182356 C4-182351					
		C4-182401					
		C4-182268					
2018-04	CT4#84	C4-183124				Implementation of pCRs agreed at CT4#84	0.6.0
		C4-183143					
		C4-183221					
		C4-183225					
		C4-183228					
		C4-183230 C4-183232					
		C4-183234					
		C4-183244					
		C4-183300					
		C4-183302					
		C4-183304					
		C4-183305					
		C4-183306					
		C4-183307					
		C4-183308 C4-183374					
		C4-183381					
		C4-183382					
		C4-183425					
		C4-183427					
		C4-183430					
		C4-183480					
		C4-183483					
		C4-183486 C4-183508					
		C4-183508		1			
		1 (,4-10.3309					II

2018-05	CT4#85					Himplementation of nCRs agreed at CIA#85	0.7.0
		C4-184351 C4-184356				Implementation of pCRs agreed at CT4#85	0.7.0
ļ l		C4-184210					
1		C4-184211					
		C4-184358					
		C4-184359					
		C4-184558					
		C4-184559					
		C4-184381					
		C4-184556					
		C4-184423					
		C4-184557 C4-184310					
		C4-184572					
		C4-184622					
2018-06	CT#80	CP-181001				Presented for information and approval.	1.0.0
	CT#80	CP-181196				Approved in CT#80	15.0.0
	CT#81	CP-182056	0001	3	В	UDM receives notification of target/new AMF after AMF planned	15.1.0
2010 00	01//01	01 102000	0001	Ŭ		removal	10.1.0
2018-09	CT#81	CP-182170	0002	1	F	DeregistrationData alignment with stage 2	15.1.0
	CT#81	CP-182172	0003	6	F	Event subscription alignment with stage 2	15.1.0
	CT#81	CP-182056	0005	5	F	Data Change Notification	15.1.0
	CT#81	CP-182056	0003	1	F	NfInstanceId	15.1.0
	CT#81	CP-182049	0004	3	F	UDM support for dynamic 5QIs and for standard 5QIs whose	15.1.0
	2.701	J. 1020-10			•	default QoS characteristics are overridden	.0.1.0
2018-09	CT#81	CP-182068	0007	4	В	Add support for 5G Trace to Nudm_SDM	15.1.0
	CT#81	CP-182056	0008	4	В	Shared Data	15.1.0
	CT#81	CP-182056	0009	1	F	Feature Negotiation	15.1.0
	CT#81	CP-182056	0010	2	F	Nudm SDM Get	15.1.0
	CT#81	CP-182056	0011	1	F	Allowing multiple monitoring reports in a single event occurrence	15.1.0
20.000	01//01	01 102000	0011		•	notification	10.1.0
2018-09	CT#81	CP-182056	0015	1	F	UDM Data change notification	15.1.0
	CT#81	CP-182056	0016	3	F	Nudm_SDM_Info Service Operation Description	15.1.0
	CT#81	CP-182056	0022		F	Authentication Info Result	15.1.0
	CT#81	CP-182056	0025	2	В	Add MicoAllowed in am-data	15.1.0
	CT#81	CP-182056	0026	2	В	Introduction of PLMN Id in UECM & UE Authentication Services	15.1.0
	CT#81	CP-182056	0028	2	F	Mobility Restriction	15.1.0
	CT#81	CP-182056	0029	1	F	SMSF addresses	15.1.0
	CT#81	CP-182056	0030	4	F	SMS subscription data	15.1.0
	CT#81	CP-182056	0031		F	Clause Numbering	15.1.0
	CT#81	CP-182056	0032	1	F	Formal OpenAPI corrections	15.1.0
	CT#81	CP-182056	0033	-	F	GMLC	15.1.0
	CT#81	CP-182056	0034		F	AUSF Instance Id	15.1.0
	CT#81	CP-182056	0036	2	F	Avoid stale sdm-subscriptions	15.1.0
	CT#81	CP-182056	0037		В	Nudm_SDM retrieval of SMS Management Subscription data	15.1.0
	CT#81	CP-182056	0038	1	F	Nudm_UECM Errors	15.1.0
	CT#81	CP-182056	0039	-	F	P-CSCF restoration callbacks	15.1.0
	CT#81	CP-182056	0040	1	F	Nudm_UEAU Errors	15.1.0
	CT#81	CP-182056	0041	1	F	Nudm_EE Errors	15.1.0
	CT#81	CP-182056	0042	1	F	Nudm_PP Errors	15.1.0
	CT#81	CP-182056	0043	2	F	UDM Group	15.1.0
	CT#81	CP-182056	0045	1	F	SUCI coding	15.1.0
	CT#81	CP-182056	0046	2	F	BackUp AMF Info	15.1.0
	CT#81	CP-182056	0047	2	F	Interworking with EPS indication	15.1.0
	CT#81	CP-182171	0048	2	F	Nudm_SDM_Subscribe for SMF	15.1.0
	CT#81	CP-182056	0050	1	F	User Plane Security Policy	15.1.0
	CT#81	CP-182056	0051	•	F	Description of Structured data types	15.1.0
	CT#81	CP-182056	0054	1	F	Provide DNN with LADN indicator per NSSAI	15.1.0
	CT#81	CP-182056	0055	'	F	UE Context In SMF Data Retrieval	15.1.0
	CT#81	CP-182056	0057		F	Time Stamp in EE Notify	15.1.0
	CT#81	CP-182056	0058		F	Naming Conventions	15.1.0
	CT#81	CP-182056	0059		F	Storage and retrieval of PGW FQDN	15.1.0
	CT#81	CP-182056	0060		F	API version number update	15.1.0
	CT#82	CP-183014	0061	1	F	Remove key attributes from map elements	15.2.0
	CT#82	CP-183014	0062	2	F	imsVoPS for non-3GPP access	15.2.0
	CT#82	CP-183014	0062	2	F	Internal-Group Identifier	15.2.0
	CT#82	CP-183014	0064	2	F	Stateless AMF support updates	15.2.0
	CT#82	CP-183014	0065	2	F	Location Reporting Configuration in Nudm_EE service	15.2.0
	J 1 π U Z			1	F	Nudm_SDM Errors	15.2.0
2018-12	CT#82	CP-183014	LUUDD				
2018-12 2018-12	CT#82	CP-183014 CP-183164	0066				
2018-12 2018-12 2018-12	CT#82 CT#82 CT#82	CP-183014 CP-183164 CP-183014	0067	4	F F	Shared Data completion  Cardinality for arrays	15.2.0 15.2.0

2018-12	CT#82	CP-183014	0070	2	F	Adding headers for cache control and conditional request to the	15.2.0
						Nudm_SubscriberDataManagement Service API	
2018-12	CT#82	CP-183014	0072	3	<u>_F_</u>	Initial Registration	15.2.0
2018-12	CT#82	CP-183014	0076	1	F	Correcting Nudm_UEAuthentication service description	15.2.0
2018-12 2018-12	CT#82 CT#82	CP-183014 CP-183014	0078 0079	1 2	F F	Add Serving Network Name to AuthEvent Remove PLMN-ID from AMF registration in OpenAPI	15.2.0 15.2.0
2018-12	CT#82	CP-183014	0080		F	Make ARP mandatory in QoS parameters	15.2.0
2018-12	CT#82	CP-183014	0081	1	F	RAT type	15.2.0
2018-12	CT#82	CP-183014	0082	1	F	Correction in UDM error and response codes	15.2.0
2018-12	CT#82	CP-183014	0083	1	F	Retrieving UE SMSF Context with its own URI	15.2.0
2018-12	CT#82	CP-183014	0084	1	F	Data type associated with Subscribed Default QoS for Default QoS	15.2.0
						Flow	
2018-12	CT#82	CP-183014	0085	1	<u>F</u>	Alignment of pattern for External identifier	15.2.0
2018-12	CT#82	CP-183014	0086	1	F	Callback URI for Deregistration Notification	15.2.0
2018-12 2018-12	CT#82	CP-183014	0088	1	F F	Static Ip Address in DNN Configuration	15.2.0
2018-12	CT#82 CT#82	CP-183014 CP-183014	0090	1	F	ImsVoPs type and attribute name correction  Clarification on nullable attributes in AmfRegistration types	15.2.0 15.2.0
2018-12	CT#82	CP-183014	0091	_ '	F	Retrieval of multiple datasets	15.2.0
2018-12	CT#82	CP-183014	0094	2	F	DeRegistration Reason: Re-registration Required	15.2.0
2018-12	CT#82	CP-183014	0095		F	APIRoot Clarification	15.2.0
2018-12	CT#82	CP-183014	0098		F	Shared Data Ids	15.2.0
2018-12	CT#82	CP-183014	0099	1	F	Subscription lifetime	15.2.0
2018-12	CT#82	CP-183014	0100	3	F	Secured packet in SorInfo	15.2.0
2018-12	CT#82	CP-183014	0103	1	F	Abbreviations	15.2.0
2018-12	CT#82	CP-183014	0104	1	F	Nudm_UECM_Deregistration clarification	15.2.0
2018-12	CT#82	CP-183014	0105		F	Location Header	15.2.0
2018-12	CT#82	CP-183014	0107	1	<u>F</u>	SUCI Encoding	15.2.0
2018-12	CT#82	CP-183014	0108	1	F F	S-NSSAI information in SmfRegistration SUCI NAI Clarification	15.2.0
2018-12 2018-12	CT#82 CT#82	CP-183014 CP-183014	0109 0110	1	F	Bulk subscriptions in UDM NF correction	15.2.0 15.2.0
2018-12	CT#82	CP-183014	0111	1	F	Introduction of Barring	15.2.0
2018-12	CT#82	CP-183014	0112	_ '	F	UDM Corrections	15.2.0
2018-12	CT#82	CP-183014	0114	2	F	Optionality of OAuth2	15.2.0
2018-12	CT#82	CP-183014	0115		F	Implement MCS priority indicator	15.2.0
2018-12	CT#82	CP-183014	0116		F	API version	15.2.0
2018-12	CT#82	CP-183014	0117	1	F	Shared Authentication Subscription	15.2.0
2018-12	CT#82	CP-183014	0118		F	ExternalDocs update	15.2.0
2018-12						'TS29505_Nudr_DataRepository.yaml' changed to 'TS29505_Subscription_Data.yaml' in Nudm_SDM API	15.2.1
2019-03	CT#83	CP-190019	0119	1	F	Content of attribute singleNssais	15.3.0
2019-03	CT#83	CP-190019	0120	1	F	Formal OpenAPI corrections	15.3.0
2019-03	CT#83	CP-190019	0121	1	F	SdmSubscription identification	15.3.0
2019-03	CT#83	CP-190019	0122	1	F	Clarification on SMS barring	15.3.0
2019-03	CT#83	CP-190019	0123	1	F	Allow retrieval of AMF registrations with SUPI	15.3.0
2019-03	CT#83	CP-190019			F	Address Editor's Note on naming conventions	15.3.0
2019-03	CT#83	CP-190019	0126		F	Remove Editor's Note on authorization	15.3.0
2019-03 2019-03	CT#83 CT#83	CP-190019 CP-190019	0127 0128	1	F F	Remove Editor's Note on data retrieval Sdm Subscription Modification	15.3.0 15.3.0
2019-03	CT#83	CP-190019 CP-190019	0130	1	F	LADN Indicator removal	15.3.0
2019-03	CT#83	CP-190019	0131	1	F	Subscribed DNN List	15.3.0
2019-03	CT#83	CP-190019	0134	2	F	Emergency Session	15.3.0
2019-03	CT#83	CP-190019	0137	1	F	Application Errors	15.3.0
2019-03	CT#83	CP-190019	0138	1	F	Plmn ID in SdmSubscriptions	15.3.0
2019-03	CT#83	CP-190019	0139	1	F	URRP Indicator	15.3.0
2019-03	CT#83	CP-190019	0141	1	F	Handling of Multi-PDU during EPS Interworking	15.3.0
2019-03	CT#83	CP-190152	0143	4	F	UE parameters update support	15.3.0
2019-03	CT#83	CP-190019	0144	1	F	Cardinality of Dateset-names	15.3.0
2019-03	CT#83	CP-190019	0145	2	F	Removal of SharedAuthenticationSubscription	15.3.0
2019-03	CT#83	CP-190019	0146	1	F	Update method for event subscription	15.3.0
2019-03 2019-03	CT#83	CP-190019	0147	2	F F	SOR correction Storage of OpenAPI specification files	15.3.0
	CT#83	CP-190019	0148 0149	1	F	API version update	15.3.0 15.3.0
	CT#92	CP-100204		1			15.3.0
2019-03	CT#83 CT#84	CP-190204 CP-191030		1	-	II ocation Header Description	
2019-03 2019-06	CT#84	CP-191030	0150	1	F F	Location Header Description  OperationId	
2019-03 2019-06 2019-06	CT#84 CT#84	CP-191030 CP-191030	0150 0151		F F	OperationId	15.4.0
2019-03 2019-06	CT#84	CP-191030	0150	1	F		
2019-03 2019-06 2019-06 2019-06	CT#84 CT#84 CT#84	CP-191030 CP-191030 CP-191030	0150 0151 0154		F F	OperationId Adding SubsId to EESubscription Essential Corrections and Re-arrange Clause Structure Partial Deletion of Monitored Resources	15.4.0 15.4.0
2019-03 2019-06 2019-06 2019-06 2019-06	CT#84 CT#84 CT#84 CT#84	CP-191030 CP-191030 CP-191030 CP-191030	0150 0151 0154 0155	1 2	F F	OperationId Adding SubsId to EESubscription Essential Corrections and Re-arrange Clause Structure Partial Deletion of Monitored Resources Correct the reference in ServingNetworkName in	15.4.0 15.4.0 15.4.0
2019-03 2019-06 2019-06 2019-06 2019-06 2019-06 2019-06	CT#84 CT#84 CT#84 CT#84 CT#84 CT#84	CP-191030 CP-191030 CP-191030 CP-191030 CP-191030 CP-191030	0150 0151 0154 0155 0156 0158	1 2 2 1	F F F	OperationId Adding SubsId to EESubscription Essential Corrections and Re-arrange Clause Structure Partial Deletion of Monitored Resources Correct the reference in ServingNetworkName in AuthenticationInfoRequest	15.4.0 15.4.0 15.4.0 15.4.0 15.4.0
2019-03 2019-06 2019-06 2019-06 2019-06 2019-06 2019-06	CT#84 CT#84 CT#84 CT#84 CT#84 CT#84	CP-191030 CP-191030 CP-191030 CP-191030 CP-191030 CP-191030 CP-191030	0150 0151 0154 0155 0156 0158	1 2 2 1	F F F F	OperationId Adding SubsId to EESubscription Essential Corrections and Re-arrange Clause Structure Partial Deletion of Monitored Resources Correct the reference in ServingNetworkName in AuthenticationInfoRequest Add trace data retrieval procedure	15.4.0 15.4.0 15.4.0 15.4.0 15.4.0
2019-03 2019-06 2019-06 2019-06 2019-06 2019-06 2019-06	CT#84 CT#84 CT#84 CT#84 CT#84 CT#84	CP-191030 CP-191030 CP-191030 CP-191030 CP-191030 CP-191030	0150 0151 0154 0155 0156 0158	1 2 2 1	F F F	OperationId Adding SubsId to EESubscription Essential Corrections and Re-arrange Clause Structure Partial Deletion of Monitored Resources Correct the reference in ServingNetworkName in AuthenticationInfoRequest	15.4.0 15.4.0 15.4.0 15.4.0 15.4.0

2019-06   CT#84   CP-191030   O164   F   CR O1281 was not correctly implemented   15.4.0   2019-06   CT#84   CP-191030   O167   1   F   Some OpenAP1 specification fillies   15.4.0   2019-06   CT#84   CP-191030   O167   1   F   Some Observation incorrect attribute name   19.4.0   2019-06   CT#84   CP-191030   O168   F   Coatlon headed in redirect reposition   15.4.0   2019-06   CT#84   CP-191030   O168   F   Coatlon headed in redirect reposition   15.4.0   2019-06   CT#84   CP-191030   O168   F   Some Open   15.4.0   2019-06   CT#84   CP-191030   O196   F   Some Open   15.4.0   2019-06   CT#84   CP-191030   O196   F   Some Open   15.4.0   2019-06   CT#84   CP-191030   O196   F   F   Some Open   15.4.0   2019-06   CT#84   CP-191030   O201   F   Some Open   15.4.0   2019-06   CT#84   CP-191030   O204   F   Sole Open   15.4.0   2019-06   CT#84   CP-191030   O204   F   Sole Open   15.4.0   2019-06   CT#84   CP-191030   O204   F   Sole Open   15.4.0   2019-06   CT#84   CP-191030   O168   S   Sole Open   15.4.0   2019-06   CT#84   CP-191050   O168   S   Sole Open   15.4.0   2019-06   CT#84   CP-191050   O176   S   Sole Open   15.4.0   2019-06   CT#84   CP-191050   O177   S   B   Add PI-U Season contravely at inter RAT mobility to and from Nb-1000   2019-06   CT#84   CP-191050   O177   S   B   Add Service opin inter In AM subscription Data to support   2019-06   CT#84   CP-191050   O177   S   B   Add Service opin inter In AM subscription Data to support   2019-06   CT#84   CP-191050   O177   S   B   Add Service opin inter In AM subscription to support   2019-06   CT#84   CP-191050   O177   S   B   Add Service opin inter In AM subscription to support   2019-06   CT#84   CP-191050   O177   S   B   Add Service opin inter In AM subscription to support   2019-06   CT#84   CP-191050   O177   S   Subscription to event 'Change of Core Network Type'   I6.0.0   2019-06   CT#84   CP-191050   O178   S   Subscription Data in Training   I6.0.0   2019-06   CT#84   CP-191050   O177   S   Subscription Data in Training   I6.0.0   2019-0							<b>,</b>	
2019-06   CT884   CP-191030   O167   1   F   Sdm-Subscription incorrect attribute name   15.4.0   2019-06   CT884   CP-191030   O168   1   F   Application error correction   15.4.0   2019-06   CT884   CP-191030   O169   F   Application error correction   15.4.0   2019-06   CT884   CP-191030   O193   1   F   Shraped Dissertation   15.4.0   2019-06   CT884   CP-191030   O193   1   F   Shraped Dissertation   15.4.0   2019-06   CT884   CP-191030   O196   1   F   Shraped Dissertation   15.4.0   2019-06   CT884   CP-191030   O196   1   F   Shraped Dissertation   15.4.0   2019-06   CT884   CP-191030   O204   F   F   Shraped Dissertation   15.4.0   2019-06   CT884   CP-191030   O204   F   F   Shraped Dissertation   15.4.0   2019-06   CT884   CP-191050   O204   F   F   Shraped Dissertation   15.4.0   2019-06   CT884   CP-191050   O204   F   F   Shraped Dissertation   15.4.0   2019-06   CT884   CP-191050   O176   C   B   Non-cachested Soft response   16.0.0   2019-06   CT884   CP-191050   O176   C   B   Non-cachested Off-septime   15.4.0   2019-06   CT884   CP-191050   O176   C   B   Add PUS session continuity at inter RAT mobility to and from NB-16.0   2019-06   CT884   CP-191050   O176   C   B   Add Service Gap timer in AM subscription Data to support   16.0.0   2019-06   CT884   CP-191050   O177   C   B   Add Service Gap timer in AM subscription Data to support   16.0.0   2019-06   CT884   CP-191050   O178   C   B   Update SM dista supporting shall data transfer   16.0.0   2019-06   CT884   CP-191050   O178   C   B   Update SM dista supporting shall data transfer   16.0.0   2019-06   CT884   CP-191050   O178   C   B   Update SM dista supporting shall data transfer   16.0.0   2019-06   CT884   CP-191050   O178   C   B   Update SM dista supporting shall data transfer   16.0.0   2019-06   CT885   CP-192103   O221   D   D18200   C   B   Update SM dista supporting shall data transfer   16.0.0   2019-09   CT885   CP-192103   O221   D   D18200   C   D18200   C   D18200   C   D18200   C   D18200   C   D18200   C   D18200	2019-06	CT#84	CP-191030	0164		F		15.4.0
2019-06   CT844   CP-191030   0169   F   Location header in redirect response   15.4.0								
2019-06   CT844   CP-191030   0189   F   Application error correction   154.0   2019-06   CT844   CP-191030   01995   1 F   Storage of SubscriptionId   154.0   2019-06   CT844   CP-191030   01996   1 F   Storage of SubscriptionId   154.0   2019-06   CT844   CP-191030   01996   1 F   Copyright Note in YAMI, likes   154.0   2019-06   CT844   CP-191030   0202   2 F   Copyright Note in YAMI, likes   154.0   2019-06   CT846   CP-191030   0202   F   F   ODB for SMF   154.0   2019-06   CT846   CP-191030   0202   F   SUCI encoding   154.0   2019-06   CT846   CP-191030   0202   F   SUCI encoding   154.0   2019-06   CT846   CP-191030   0700   F   SUCI encoding   154.0   2019-06   CT846   CP-191050   0176   Z   B   Nutri m NIDAU shortward in service   156.0   2019-06   CT846   CP-191050   0177   Z   B   Nutri m NIDAU shortward in service   156.0   2019-06   CT846   CP-191050   0177   Z   B   On cacheable 501 response   156.0   2019-06   CT846   CP-191050   0177   Z   B   On cacheable 501 response   156.0   2019-06   CT846   CP-191050   0177   Z   B   On cacheable 501 response   156.0   2019-06   CT846   CP-191050   0177   Z   B   Under SM Cabecraption data   156.0   2019-06   CT846   CP-191050   0177   Z   B   Under SM Cates under the subscription Data t to support   166.0   2019-06   CT846   CP-191050   0177   Z   B   Under SM Cates under the subscription Data t to support   166.0   2019-06   CT846   CP-191050   0177   Z   B   Under SM Cates under the subscription Data t to support   166.0   2019-06   CT846   CP-191050   0177   Z   B   Under SM Cates under the subscription Data t transfer   166.0   2019-06   CT846   CP-191050   0177   Z   B   Under SM Cates under the subscription Data t transfer   166.0   2019-09   CT846   CP-192103   0211   1 A   DNN Barring   166.0   2019-09   CT846   CP-192103   0221   1 B   Nutri M DATA   02010   0201	2019-06	CT#84	CP-191030	0167	1	F	Sdm-Subscription incorrect attribute name	15.4.0
2019-06   CT844   CP-191030   0193   1 F   Storage of SubscriptionId   15.4.0	2019-06	CT#84	CP-191030	0168	1	F	Location header in redirect response	15.4.0
2019-06   CT844 CP-191030   0195   1 F   Storage of SubscriptionId   15.4.0	2019-06	CT#84	CP-191030	0169		F	Application error correction	15.4.0
2019-06   CTR44   CP-191030   0195   1   F   Shared Data Ids   15.4.0   2019-06   CTR44   CP-191030   0196   T   F   Copyright Note in YAMI, lifes   15.4.0   2019-06   CTR44   CP-191030   0202   Z   F   Copyright Note in YAMI, lifes   15.4.0   2019-06   CTR44   CP-191030   0202   Z   F   SUCI encoding   15.4.0   2019-06   CTR44   CP-191030   0202   Z   F   SUCI encoding   15.4.0   2019-06   CTR44   CP-191030   0202   Z   F   SUCI encoding   15.4.0   2019-06   CTR44   CP-191050   0176   Z   B   Nuder in NIDAU throiziation service   15.4.0   2019-06   CTR44   CP-191050   0176   Z   B   Nuder in NIDAU throiziation service   16.0.0   2019-06   CTR44   CP-191050   0177   Z   B   Add PRU Season contributly at inter RAT mobility to and from NE   2019-06   CTR44   CP-191050   0177   Z   B   Add Sences Cap Protect And Sences Cap Protect Season   2019-06   CTR44   CP-191050   0177   Z   B   Add Sences Cap Protect Season   2019-06   CTR44   CP-191050   0177   Z   B   Add Sences Cap Protect Season   2019-06   CTR44   CP-191050   0177   Z   B   Add Sences Cap Protect Season   2019-06   CTR44   CP-191050   0177   Z   B   Add Sences Cap Protect Season   2019-06   CTR44   CP-191050   0177   Z   B   Add Sences Cap Protect Season   2019-06   CTR44   CP-191050   0177   Z   B   Add Sences Cap Protect Season   2019-06   CTR44   CP-191050   0177   Z   B   Add Sences Cap Protect Season   2019-06   CTR44   CP-191050   0177   Z   B   Subscription Data for Tracing   16.00   2019-06   CTR44   CP-191060   0178   Z   B   Subscription Data for Tracing   16.00   2019-09   CTR45   CP-192103   0221   1   A   DNN Barring   16.00   2019-09   CTR45   CP-192103   0221   1   A   DNN Barring   16.10   2019-09   CTR45   CP-192103   0221   1   A   DNN Barring   16.10   2019-09   CTR45   CP-192103   0221   2   B   Closed Access Group   16.10   2019-09   CTR45   CP-192103   0221   2   B   Closed Access Group   16.10   2019-09   CTR45   CP-192103   0221   2   B   Closed Access Group   16.10   2019-09   CTR45   CP-192103   0221   CTR45   CP-192103   022	2019-06			0193	1	F	Storage of SubscriptionId	15.4.0
2019-06   CT#84   CP-191030   0291   F   Copyright Note in YAMIL-files   15.4.0						F		
2019-06   CT844   CP-191030   0202   2   F   DOB for SMF   15.4.0   2019-06   CT844   CP-191030   0202   2   F   SUCI encoding   15.4.0   2019-06   CT844   CP-191050   0163   3   8   Nudm. NIDDA-thorization service   15.4.0   2019-06   CT844   CP-191057   0170   1   B   Non cacheable 501 response   16.0.0   16.0.0   2019-06   CT844   CP-191050   0176   2   B   Add PDU Session continuity at inter RAT mobility to and from NB-1020   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   17.0   1   B   Non cacheable 501 response   16.0.0   1   1   1   1   1   1   1   1   1								
2019-06   CT844   CP-191030   0202   2   F   SUCI encoding   154.0					<u> </u>			
2019-06   CT#84   CP-191030   0204   F   SCPP TS 29.503 API version update   15.4.0					_			
2019-06   CT884   CP-191050   0183   3   B   Nudm_NIDDAuthorization service   16.0.0   2019-06   CT884   CP-191050   0176   2   B   Add PDU Session continuity at inter RAT mobility to and from NB- 16.0.0   2019-06   CT884   CP-191050   0177   2   B   Add Service Gap timer in AM subscription Data to support   16.0.0   2019-06   CT884   CP-191050   0178   2   B   Add Service Gap timer in AM subscription Data to support   16.0.0   2019-06   CT884   CP-191050   0178   2   B   Update SM data supporting small data transfer   16.0.0   2019-06   CT884   CP-191057   0198   B   Subscription to event *Change of Core Network Type*   16.0.0   2019-06   CT884   CP-191057   0199   B   Subscription to event *Change of Core Network Type*   16.0.0   2019-06   CT884   CP-191057   0199   B   Subscription to event *Change of Core Network Type*   16.0.0   2019-09   CT865   CP-192103   0211   1   A   Monitore Resource URI   16.0.0   2019-09   CT865   CP-192103   0211   1   A   Monitore Resource URI   16.1.0   2019-09   CT865   CP-192103   0211   1   A   Monitore Resource URI   16.1.0   2019-09   CT865   CP-192103   0221   2   B   P-CSCF Restoration Trigger   16.1.0   2019-09   CT865   CP-192103   0221   2   B   P-CSCF Restoration Trigger   16.1.0   2019-09   CT865   CP-192130   0220   B   SMS Altering   16.1.0   2019-09   CT865   CP-192130   0220   B   SMS Altering   16.1.0   2019-09   CT865   CP-192130   0221   B   CREATE								
2019-06   CT894   CP-191050   0176   1   B. Non cacheable 501 response   16.0.0								
2019-06   CTR84   CP-191050   D176   Z   B Add PDU Session continuity at inter RAT mobility to and from NB- 16.0.0							_	
2019-06   CT#84   CP-191050   0178   2								16.0.0
2019-06   CT#94   CP-191050   0177   2   B   Add Service Gap timer in AM subscription Data to support   16.0.0	2019-06	CT#84	CP-191050	0176	2	В		16.0.0
2019-06   CT#94   CP-191050   0178   2   B   Update SM data supporting small data transfer   16.0.0								
2019-06   CTM94   CP-191050   0178   2   B   Update SM data supporting small data transfer   16.0.0	2019-06	CT#84	CP-191050	0177	2	В	Add Service Gap timer in AM subscription Data t to support	16.0.0
2019-06   CTM84   CP-191057   0197   1   B   Subscription to event 'Change of Core Network Type'   16.0.0							Overload Control for small data	
2019-06   CTM84   CP-191057   0197   1   B   Subscription to event 'Change of Core Network Type'   16.0.0	2019-06	CT#84	CP-191050	0178	2	В	Update SM data supporting small data transfer	16.0.0
2019-06   CT#84   CP-191048   Q203   F   3GPF TS 29.503 API version update   16.0.0	2019-06		CP-191057	0197	1	В		16.0.0
2019-06   CT#85   CP-191048   D203   F   GSPP TS 29 503 API version update   16.0.0								
2019-09   CT#85   CP-192103   0221   1 A   DNN Barring   16.1.0   2019-09   CT#85   CP-192130   0221   1 A   Montrored Resource URI   16.1.0   2019-09   CT#85   CP-192131   0209   1 B   Network Sticing Subscription Change   16.1.0   2019-09   CT#85   CP-192191   0209   2 B   SMS Alterting   16.1.0   2019-09   CT#85   CP-192032   0212   1 B   Closed Access Group   16.1.0   2019-09   CT#85   CP-192032   0212   1 B   Closed Access Group   16.1.0   2019-09   CT#85   CP-192032   0212   1 B   Closed Access Group   16.1.0   2019-09   CT#85   CP-192133   0213   2 B   VN-Group parameter provisioning   16.1.0   2019-09   CT#85   CP-192188   0214   1 B   Providing 5G SRVCC Related Subscription to AMF   16.1.0   2019-09   CT#85   CP-192188   0215   1 B   Report 5G SRVCC Related Subscription to AMF   16.1.0   2019-09   CT#85   CP-192188   0215   1 B   Report 5G SRVCC Capability to UDM   16.1.0   2019-09   CT#85   CP-192187   0217   1 B   Subscription on redundant sessions   16.1.0   2019-09   CT#85   CP-192123   0219   2 B   Indicating partially implemented PATCH   16.1.0   2019-09   CT#85   CP-192123   0222   3 B   Sides report of SRVCC Related Subscription Data   16.1.0   2019-09   CT#85   CP-192123   0222   3 B   Sides Specific Authentication and Authorization Data   16.1.0   2019-09   CT#85   CP-192123   0222   3 B   Sides Specific Authentication and Authorization Data   16.1.0   2019-09   CT#85   CP-192123   0223   5 F   Correction on the subscription Id sent to the consumer   16.1.0   2019-09   CT#85   CP-192123   0223   5 F   Correction on the subscription data   16.1.0   2019-09   CT#85   CP-192123   0223   5 F   Correction on the subscription data   16.1.0   2019-09   CT#85   CP-192123   0223   5 F   Correction on the subscription description   16.1.0   2019-09   CT#85   CP-192123   0239   F   Correction on the subscription description   16.1.0   2019-09   CT#85   CP-192123   0239   F   Correction on the subscription description   16.1.0   2019-09   CT#85   CP-192123   0235   5 F   Correction to shared Data   CP-								
2019-09   CT#85   CP-192133   2026   1   A   Monitored Resource URI   16.1.0   2019-09   CT#85   CP-192191   2027   2   B   P-CSCF Restoration Trigger   16.1.0   2019-09   CT#85   CP-192191   2029   B   SMS Alerting   16.1.0   2019-09   CT#85   CP-192191   2029   B   SMS Alerting   16.1.0   2019-09   CT#85   CP-192032   2012   1   B   Closed Access Group   16.1.0   2019-09   CT#85   CP-192133   2013   2   B   VN-Group parameter provisioning   16.1.0   2019-09   CT#85   CP-192138   2014   1   B   Providing SG SRVCC Related Subscription to AMF   16.1.0   2019-09   CT#85   CP-192138   2014   1   B   Providing SG SRVCC Related Subscription to AMF   16.1.0   2019-09   CT#85   CP-192138   2015   1   B   Report SG SRVCC Capability to UDM   VPGW-SMF   16.1.0   2019-09   CT#85   CP-192138   2015   1   B   Report SG SRVCC Capability to UDM   VPGW-SMF   16.1.0   2019-09   CT#85   CP-192130   2019   2   B   Indicating partially implemented PATCH   16.1.0   2019-09   CT#85   CP-192130   2019   2   B   Indicating partially implemented PATCH   16.1.0   2019-09   CT#85   CP-192123   2019   2   B   Indicating partially implemented PATCH   16.1.0   2019-09   CT#85   CP-192026   2024   2   B   SG VN group data   16.1.0   2019-09   CT#85   CP-192123   2029   3   B   Add NB-10T   UP Application and Authorization Data   16.1.0   2019-09   CT#85   CP-192123   2022   3   B   Add NB-10T   UP Application or rors   16.1.0   2019-09   CT#85   CP-192132   2022   3   B   Add NB-10T   UP Application or rors   16.1.0   2019-09   CT#85   CP-192132   2022   3   B   Add NB-10T   UP Application of VM All Subscription data   16.1.0   2019-09   CT#85   CP-192132   2022   F   Correction of NB subscription data   16.1.0   2019-09   CT#85   CP-192132   2023   B   Granted Validity Time for NIDD authorisation   16.1.0   2019-09   CT#85   CP-192132   2029   F   Correction of NB subscription description   16.1.0   2019-09   CT#85   CP-192132   2029   F   Correction of NB subscription description   16.1.0   2019-09   CT#85   CP-192139   CP-192130   CP-19			CP-102102		1			
2019-09   CT#85   CP-192191   2029   B   SMS Alerting   16.1.0   2019-09   CT#85   CP-192191   2029   B   SMS Alerting   16.1.0   2019-09   CT#85   CP-192191   2029   B   SMS Alerting   16.1.0   2019-09   CT#85   CP-192193   2012   1   B   Closed Access Group   16.1.0   2019-09   CT#85   CP-192188   2014   1   B   Providing SG SRVCC Related Subscription to AMF   16.1.0   2019-09   CT#85   CP-192188   2014   1   B   Providing SG SRVCC Related Subscription to AMF   16.1.0   2019-09   CT#85   CP-192188   2014   1   B   Providing SG SRVCC Related Subscription to AMF   16.1.0   2019-09   CT#85   CP-192187   2016   F   Retrieve Subscribed S-NSSAl from UDM by PGW+SMF   16.1.0   2019-09   CT#85   CP-192187   2017   1   B   Subscription on redundant sessions   16.1.0   2019-09   CT#85   CP-192123   2019   2   B   Indicating partially implemented PATCH   16.1.0   2019-09   CT#85   CP-192123   2023   1   F   UDM Application errors   16.1.0   2019-09   CT#85   CP-192123   2023   1   F   UDM Application errors   16.1.0   2019-09   CT#85   CP-192123   2023   2   B   SG VN group data   16.1.0   2019-09   CT#85   CP-192123   2023   2   F   Correction on the subscription of Mathematical   16.1.0   2019-09   CT#85   CP-192123   2028   3   B   Add NB-1oT UE Priority in AM subscription data   16.1.0   2019-09   CT#85   CP-192132   2023   2   F   Correction of CN Type change event   16.1.0   2019-09   CT#85   CP-192132   2023   2   F   Correction of CN Type change event   16.1.0   2019-09   CT#85   CP-192132   2023   2   F   Correction of CN Type change event   16.1.0   2019-09   CT#85   CP-192132   2023   2   F   Correction of CN Type change event   16.1.0   2019-09   CT#85   CP-192132   2033   E   Repreted UE Behaviour Parameters provisioning   16.1.0   2019-09   CT#85   CP-192132   2033   E   Repreted UE Behaviour Parameters provisioning   16.1.0   2019-09   CT#85   CP-192132   2033   E   Repreted UE Behaviour Parameters provisioning   16.1.0   2019-12   CT#86   CP-193049   2056   E   B   Sepreted UE Behaviour Parameters provi								
2019-09   CT#85   CP-192191   2020   B   MS Alerting   16.1.0								
2019-09   CT#85   CP-192032   2012   1   B   Closed Access Group   16.1.0								
2019-09   CT#85   CP-192133   Q212   1   B   Closed Access Group   16.1.0					2			
2019-09   CT#85   CP-192183   Q214   1   B   Providing 56 SRVCC Related Subscription to AMF   16.1.0								
2019-09			CP-192032					
2019-09   CT#85   CP-192183   CP-19218   CP-192187	2019-09	CT#85	CP-192133	0213	2	В		
2019-09   CT#85   CP-192123   O217   1   B   Subscription or redundant sessions   16.1.0	2019-09	CT#85	CP-192188	0214	1	В	Providing 5G SRVCC Related Subscription to AMF	16.1.0
2019-09   CT#85   CP-192123   O217   1   B   Subscription or redundant sessions   16.1.0	2019-09	CT#85	CP-192188	0215	1	В	Report 5G SRVCC Capability to UDM	16.1.0
2019-09   CT#85   CP-192123   O219   2   B   Indicating partially implemented PATCH   16.1.0						F		16.1.0
2019-09   CT#85   CP-192123   0219   2   B   Indicating partially implemented PATCH   16.1.0   2019-09   CT#85   CP-192026   0222   3   B   Slice Specific Authentication and Authorization Data   16.1.0   2019-09   CT#85   CP-192123   0223   1   F   UDM Application errors   16.1.0   2019-09   CT#85   CP-192123   0225   2   B   5G VN group data   16.1.0   2019-09   CT#85   CP-192123   0225   2   F   Correction on the subscription Id sent to the consumer   16.1.0   2019-09   CT#85   CP-192123   0228   3   B   Add NB-IoT UE Priority in AM subscription data   16.1.0   2019-09   CT#85   CP-192132   0229   3   B   Granted Validity Time for NIDD authorisation   16.1.0   2019-09   CT#85   CP-102132   0232   F   Correction of CN Type change event   16.1.0   2019-09   CT#85   CP-102132   0232   F   Correction of CN Type change event   16.1.0   2019-09   CT#85   CP-192132   0233   D   Setwork configuration Parameters Provisioning   16.1.0   2019-09   CT#85   CP-192092   0234   3   B   Expected UE Behaviour Parameters provision   16.1.0   2019-09   CT#85   CP-192132   0235   D   B   Id translation for MSISDN-less MO SMS service   16.1.0   2019-09   CT#85   CP-192132   0239   F   Correction to sharedDataSubscription description   16.1.0   2019-09   CT#85   CP-192130   0234   S   B   Services invoked by NWDAF   16.1.0   2019-09   CT#85   CP-192130   0241   B   Services invoked by NWDAF   16.1.0   2019-10   CT#86   CP-193050   0268   2   A   Missing AssociationType parameter   16.2.0   2019-12   CT#86   CP-193050   0250   2   B   Services invoked by NWDAF   16.2.0   2019-12   CT#86   CP-193050   0250   2   B   Services invoked by NWDAF   16.2.0   2019-12   CT#86   CP-193050   0250   2   B   Serving Network Name in SNPN   16.2.0   2019-12   CT#86   CP-193050   0250   2   B   Serving Network Name in SNPN   16.2.0   2019-12   CT#86   CP-193050   0250   2   B   Serving Network Name in SNPN   16.2.0   2019-12   CT#86   CP-193050   0250   2   B   Serving Network Name in SNPN   16.2.0   2019-12   CT#86   CP-193049   0256   5   B					1			
2019-09   CT#85   CP-192026   0222   3   B   Siice Specific Authentication and Authorization Data   16.1.0								
2019-09   CT#85   CP-192123   0224   2   B   5G VN group data   16.1.0								
2019-09   CT#85   CP-192025   C224   2 B   5G VN group data   16.1.0								
2019-09   CT#85   CP-192123   0225   2   F   Correction on the subscription Id sent to the consumer   16.1.0								
CP-192132   O228   3   B   Add NB-IoT UE Priority in AM subscription data   16.1.0								
CP19-09								
2019-09							Add NB-IoT UE Priority in AM subscription data	
2019-09				0229	3			
2019-09   CT#85   CP-192092   0234   3   B   Expected UE Behaviour Parameters provision   16.1.0   2019-09   CT#85   CP-192132   0235   2   B   Id translation for MSISDN-less MO SMS service   16.1.0   2019-09   CT#85   CP-192123   0239   F   Correction to sharedDataSubscription description   16.1.0   2019-09   CT#85   CP-192135   0241   B   Services invoked by NWDAF   16.1.0   2019-09   CT#85   CP-192120   0243   F   API Version Update   16.1.0   2019-12   CT#86   CP-193027   0268   2   A   Missing AssociationType parameter   16.2.0   2019-12   CT#86   CP-193054   0208   5   B   Domain Selection Info Retrieval   16.2.0   2019-12   CT#86   CP-193054   0208   5   B   Domain Selection Info Retrieval   16.2.0   2019-12   CT#86   CP-193054   0250   2   B   Serving Network Name in SNPN   16.2.0   2019-12   CT#86   CP-193046   0252   3   B   QoS for wireline access network   16.2.0   2019-12   CT#86   CP-193046   0252   3   B   QoS for wireline access network   16.2.0   2019-12   CT#86   CP-193055   0253   2   B   LCS privacy   16.2.0   2019-12   CT#86   CP-193049   0256   4   B   Retrieve Enhance Coverage Restriction Data   16.2.0   2019-12   CT#86   CP-193049   0255   5   B   Update Enhance Coverage Restriction Data   16.2.0   2019-12   CT#86   CP-193049   0258   5   B   BatteryIndication and scheduledCommunicationType parameter   16.2.0   2019-12   CT#86   CP-193049   0258   6   B   BatteryIndication and scheduledCommunicationType parameter   16.2.0   2019-12   CT#86   CP-193049   0256   5   B   Update Enhance Coverage Restriction Data   16.2.0   2019-12   CT#86   CP-193049   0256   5   B   Update Enhance Coverage Restriction Data   16.2.0   2019-12   CT#86   CP-193049   0256   5   B   Update Enhance Coverage Restriction Data   16.2.0   2019-12   CT#86   CP-193049   0256   5   B   Update Enhance Coverage Restriction Data   16.2.0   2019-12   CT#86   CP-193049   0256   4   B   Retrieve Enhance Coverage Restriction Data   16.2.0   2019-12   CT#86   CP-193049   0256   4   B   Network Configuration Parameters in SDM								
2019-09	2019-09	CT#85	CP-192132	0233	2	В	Network configuration Parameters Provisioning	16.1.0
2019-09	2019-09	CT#85	CP-192092	0234	3	В	Expected UE Behaviour Parameters provision	16.1.0
C199-09				0235		В		16.1.0
Description						F		
C199-09						_		
2019-12         CT#86         CP-193027         0268         2         A         Missing AssociationType parameter         16.2.0           2019-12         CT#86         CP-193054         0208         5         B         Domain Selection Info Retrieval         16.2.0           2019-12         CT#86         CP-193048         0247         B         Subscribed NSSAI from the UDM         16.2.0           2019-12         CT#86         CP-193046         0252         3         B         Serving Network Name in SNPN         16.2.0           2019-12         CT#86         CP-193046         0252         3         B         QOS for wireline access network         16.2.0           2019-12         CT#86         CP-193055         0253         2         B         LCS privacy         16.2.0           2019-12         CT#86         CP-193055         0254         1         B         Mobile Originated Data         16.2.0           2019-12         CT#86         CP-193049         0255         4         B         Retrieve Enhance Coverage Restriction Data         16.2.0           2019-12         CT#86         CP-193049         0258         6         B         BatterlyIndication and scheduledCommunicationType parameter provision         16.2.0								
CT#86					2			
CT#86								
2019-12   CT#86   CP-193050   O250   Z   B   Serving Network Name in SNPN   16.2.0					5			
2019-12         CT#86         CP-193046         0252         3         B         QoS for wireline access network         16.2.0           2019-12         CT#86         CP-193055         0253         2         B         LCS privacy         16.2.0           2019-12         CT#86         CP-193049         0255         4         B         Mobile Originated Data         16.2.0           2019-12         CT#86         CP-193049         0255         4         B         Retrieve Enhance Coverage Restriction Data         16.2.0           2019-12         CT#86         CP-193049         0258         6         B         BatteryIndication and scheduledCommunicationType parameter provision         16.2.0           2019-12         CT#86         CP-193049         0259         2         F         Correct Identifier Translation in Resource Overview         16.2.0           2019-12         CT#86         CP-193049         0259         2         F         Correct Identifier Translation in Resource Overview         16.2.0           2019-12         CT#86         CP-193049         0260         1         B         Extend PpDIPacketCount         16.2.0           2019-12         CT#86         CP-193050         0262         2         B         5G VN group data in Sh								
2019-12         CT#86         CP-193055         0253         2         B         LCS privacy         16.2.0           2019-12         CT#86         CP-193055         0254         1         B         Mobile Originated Data         16.2.0           2019-12         CT#86         CP-193049         0255         4         B         Retrieve Enhance Coverage Restriction Data         16.2.0           2019-12         CT#86         CP-193049         0256         5         B         Update Enhance Coverage Restriction Data         16.2.0           2019-12         CT#86         CP-193049         0258         6         B         BatteryIndication and scheduledCommunicationType parameter provision         16.2.0           2019-12         CT#86         CP-193049         0259         2         F         Correct Identifier Translation in Resource Overview         16.2.0           2019-12         CT#86         CP-193049         0260         1         B         Extend PpDIPacketCount         16.2.0           2019-12         CT#86         CP-193050         0262         2         B         5G VN group data in SharedData         16.2.0           2019-12         CT#86         CP-193050         0263         1         B         5G VN group data in SharedData <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
2019-12         CT#86         CP-193055         0254         1         B         Mobile Originated Data         16.2.0           2019-12         CT#86         CP-193049         0255         4         B         Retrieve Enhance Coverage Restriction Data         16.2.0           2019-12         CT#86         CP-193049         0256         5         B         Update Enhance Coverage Restriction Data         16.2.0           2019-12         CT#86         CP-193049         0258         6         B         BatteryIndication and scheduledCommunicationType parameter provision         16.2.0           2019-12         CT#86         CP-193049         0259         2         F         Correct Identifier Translation in Resource Overview         16.2.0           2019-12         CT#86         CP-193049         0260         1         B         Extend PpDIPacketCount         16.2.0           2019-12         CT#86         CP-193049         0260         1         B         Extend PpDIPacketCount         16.2.0           2019-12         CT#86         CP-193050         0262         2         B         5G VN group data in SharedData         16.2.0           2019-12         CT#86         CP-193050         0263         1         B         Network Configuration P								
2019-12         CT#86         CP-193049         0255         4         B         Retrieve Enhance Coverage Restriction Data         16.2.0           2019-12         CT#86         CP-193049         0256         5         B         Update Enhance Coverage Restriction Data         16.2.0           2019-12         CT#86         CP-193049         0258         6         B         BatteryIndication and scheduledCommunicationType parameter provision         16.2.0           2019-12         CT#86         CP-193049         0259         2         F         Correct Identifier Translation in Resource Overview         16.2.0           2019-12         CT#86         CP-193049         0260         1         B         Extend PpDIPacketCount         16.2.0           2019-12         CT#86         CP-193279         0261         6         B         UE expected behaviour in SDM         16.2.0           2019-12         CT#86         CP-193050         0262         2         B         5G VN group data in SharedData         16.2.0           2019-12         CT#86         CP-193050         0263         1         B         5G VN group data in PP         16.2.0           2019-12         CT#86         CP-193049         0265         4         B         Network Configura	2019-12	CT#86	CP-193055	0253	2	В		16.2.0
2019-12         CT#86         CP-193049         0255         4         B         Retrieve Enhance Coverage Restriction Data         16.2.0           2019-12         CT#86         CP-193049         0256         5         B         Update Enhance Coverage Restriction Data         16.2.0           2019-12         CT#86         CP-193049         0258         6         B         BatteryIndication and scheduledCommunicationType parameter provision         16.2.0           2019-12         CT#86         CP-193049         0259         2         F         Correct Identifier Translation in Resource Overview         16.2.0           2019-12         CT#86         CP-193049         0260         1         B         Extend PpDIPacketCount         16.2.0           2019-12         CT#86         CP-193279         0261         6         B         UE expected behaviour in SDM         16.2.0           2019-12         CT#86         CP-193050         0262         2         B         5G VN group data in SharedData         16.2.0           2019-12         CT#86         CP-193050         0263         1         B         5G VN group data in PP         16.2.0           2019-12         CT#86         CP-193049         0265         4         B         Network Configura	2019-12	CT#86	CP-193055	0254	1	В	Mobile Originated Data	16.2.0
2019-12         CT#86         CP-193049         0256         5         B         Update Enhance Coverage Restriction Data         16.2.0           2019-12         CT#86         CP-193049         0258         6         B         BatteryIndication and scheduledCommunicationType parameter provision         16.2.0           2019-12         CT#86         CP-193049         0259         2         F         Correct Identifier Translation in Resource Overview         16.2.0           2019-12         CT#86         CP-193049         0260         1         B         Extend PpDIPacketCount         16.2.0           2019-12         CT#86         CP-193079         0261         6         B         UE expected behaviour in SDM         16.2.0           2019-12         CT#86         CP-193050         0262         2         B         5G VN group data in SharedData         16.2.0           2019-12         CT#86         CP-193050         0263         1         B         5G VN group data in PP         16.2.0           2019-12         CT#86         CP-193049         0265         4         B         Network Configuration Parameters in SDM         16.2.0           2019-12         CT#86         CP-193063         0269         B         Downlink Data Delivery Status Event <td>2019-12</td> <td>CT#86</td> <td></td> <td>0255</td> <td>4</td> <td>В</td> <td></td> <td></td>	2019-12	CT#86		0255	4	В		
2019-12         CT#86         CP-193049         0258         6         B BatteryIndication and scheduledCommunicationType parameter provision         16.2.0           2019-12         CT#86         CP-193049         0259         2         F Correct Identifier Translation in Resource Overview         16.2.0           2019-12         CT#86         CP-193049         0260         1         B Extend PpDIPacketCount         16.2.0           2019-12         CT#86         CP-193279         0261         6         B UE expected behaviour in SDM         16.2.0           2019-12         CT#86         CP-193050         0262         2         B 5G VN group data in SharedData         16.2.0           2019-12         CT#86         CP-193050         0263         1         B 5G VN group data in PP         16.2.0           2019-12         CT#86         CP-193049         0265         4         B Network Configuration Parameters in SDM         16.2.0           2019-12         CT#86         CP-193063         0266         1         B Location report for non-3GPP access         16.2.0           2019-12         CT#86         CP-193049         0269         B Downlink Data Delivery Status Event         16.2.0           2019-12         CT#86         CP-193027         0272         1 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
Description   Description								
2019-12         CT#86         CP-193049         0259         2         F         Correct Identifier Translation in Resource Overview         16.2.0           2019-12         CT#86         CP-193049         0260         1         B         Extend PpDIPacketCount         16.2.0           2019-12         CT#86         CP-193279         0261         6         B         UE expected behaviour in SDM         16.2.0           2019-12         CT#86         CP-193050         0262         2         B         5G VN group data in SharedData         16.2.0           2019-12         CT#86         CP-193050         0263         1         B         5G VN group data in PP         16.2.0           2019-12         CT#86         CP-193049         0265         4         B         Network Configuration Parameters in SDM         16.2.0           2019-12         CT#86         CP-193063         0266         1         B         Location report for non-3GPP access         16.2.0           2019-12         CT#86         CP-193049         0269         B         Downlink Data Delivery Status Event         16.2.0           2019-12         CT#86         CP-193027         0272         1         A         Nssai Inclusion Allowed         16.2.0	2010.12	Ο 1 πΟΟ	01 100040	0200	"			10.2.0
2019-12         CT#86         CP-193049         0260         1         B         Extend PpDIPacketCount         16.2.0           2019-12         CT#86         CP-193279         0261         6         B         UE expected behaviour in SDM         16.2.0           2019-12         CT#86         CP-193050         0262         2         B         5G VN group data in SharedData         16.2.0           2019-12         CT#86         CP-193050         0263         1         B         5G VN group data in PP         16.2.0           2019-12         CT#86         CP-193049         0265         4         B         Network Configuration Parameters in SDM         16.2.0           2019-12         CT#86         CP-193063         0266         1         B         Location report for non-3GPP access         16.2.0           2019-12         CT#86         CP-193049         0269         B         Downlink Data Delivery Status Event         16.2.0           2019-12         CT#86         CP-193036         0270         2         F         Correction on notifications for AMF registration in UDM         16.2.0           2019-12         CT#86         CP-193027         0272         1         A         Nssai Inclusion Allowed         16.2.0	2010-12	CT#86	CP-103040	0250	2	F		1620
2019-12         CT#86         CP-193279         0261         6         B         UE expected behaviour in SDM         16.2.0           2019-12         CT#86         CP-193050         0262         2         B         5G VN group data in SharedData         16.2.0           2019-12         CT#86         CP-193050         0263         1         B         5G VN group data in PP         16.2.0           2019-12         CT#86         CP-193049         0265         4         B         Network Configuration Parameters in SDM         16.2.0           2019-12         CT#86         CP-193063         0266         1         B         Location report for non-3GPP access         16.2.0           2019-12         CT#86         CP-193049         0269         B         Downlink Data Delivery Status Event         16.2.0           2019-12         CT#86         CP-193036         0270         2         F         Correction on notifications for AMF registration in UDM         16.2.0           2019-12         CT#86         CP-193027         0272         1         A         Nssai Inclusion Allowed         16.2.0           2019-12         CT#86         CP-193027         0280         A         Regular Expression of SuciOrSupi         16.2.0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>								
2019-12         CT#86         CP-193050         0262         2         B         5G VN group data in SharedData         16.2.0           2019-12         CT#86         CP-193050         0263         1         B         5G VN group data in PP         16.2.0           2019-12         CT#86         CP-193049         0265         4         B         Network Configuration Parameters in SDM         16.2.0           2019-12         CT#86         CP-193063         0266         1         B         Location report for non-3GPP access         16.2.0           2019-12         CT#86         CP-193049         0269         B         Downlink Data Delivery Status Event         16.2.0           2019-12         CT#86         CP-193036         0270         2         F         Correction on notifications for AMF registration in UDM         16.2.0           2019-12         CT#86         CP-193027         0272         1         A         Nssai Inclusion Allowed         16.2.0           2019-12         CT#86         CP-193027         0280         A         Regular Expression of SuciOrSupi         16.2.0           2019-12         CT#86         CP-193031         0300         1         A         Wildcard DNN         16.2.0								
2019-12         CT#86         CP-193050         0263         1         B         5G VN group data in PP         16.2.0           2019-12         CT#86         CP-193049         0265         4         B         Network Configuration Parameters in SDM         16.2.0           2019-12         CT#86         CP-193063         0266         1         B         Location report for non-3GPP access         16.2.0           2019-12         CT#86         CP-193049         0269         B         Downlink Data Delivery Status Event         16.2.0           2019-12         CT#86         CP-193036         0270         2         F         Correction on notifications for AMF registration in UDM         16.2.0           2019-12         CT#86         CP-193027         0272         1         A         Nssai Inclusion Allowed         16.2.0           2019-12         CT#86         CP-193027         0280         A         Regular Expression of SuciOrSupi         16.2.0           2019-12         CT#86         CP-193027         0299         A         Availability after DDN Failure         16.2.0           2019-12         CT#86         CP-193031         0300         1         A         Wildcard DNN         16.2.0								
2019-12         CT#86         CP-193049         0265         4         B         Network Configuration Parameters in SDM         16.2.0           2019-12         CT#86         CP-193063         0266         1         B         Location report for non-3GPP access         16.2.0           2019-12         CT#86         CP-193049         0269         B         Downlink Data Delivery Status Event         16.2.0           2019-12         CT#86         CP-193036         0270         2         F         Correction on notifications for AMF registration in UDM         16.2.0           2019-12         CT#86         CP-193027         0272         1         A         Nssai Inclusion Allowed         16.2.0           2019-12         CT#86         CP-193027         0280         A         Regular Expression of SuciOrSupi         16.2.0           2019-12         CT#86         CP-193027         0299         A         Availability after DDN Failure         16.2.0           2019-12         CT#86         CP-193031         0300         1         A         Wildcard DNN         16.2.0								
2019-12         CT#86         CP-193063         0266         1         B         Location report for non-3GPP access         16.2.0           2019-12         CT#86         CP-193049         0269         B         Downlink Data Delivery Status Event         16.2.0           2019-12         CT#86         CP-193036         0270         2         F         Correction on notifications for AMF registration in UDM         16.2.0           2019-12         CT#86         CP-193027         0272         1         A         Nssai Inclusion Allowed         16.2.0           2019-12         CT#86         CP-193027         0280         A         Regular Expression of SuciOrSupi         16.2.0           2019-12         CT#86         CP-193027         0299         A         A vailability after DDN Failure         16.2.0           2019-12         CT#86         CP-193031         0300         1         A         Wildcard DNN         16.2.0						В		
2019-12         CT#86         CP-193063         0266         1         B         Location report for non-3GPP access         16.2.0           2019-12         CT#86         CP-193049         0269         B         Downlink Data Delivery Status Event         16.2.0           2019-12         CT#86         CP-193036         0270         2         F         Correction on notifications for AMF registration in UDM         16.2.0           2019-12         CT#86         CP-193027         0272         1         A         Nssai Inclusion Allowed         16.2.0           2019-12         CT#86         CP-193027         0280         A         Regular Expression of SuciOrSupi         16.2.0           2019-12         CT#86         CP-193027         0299         A         A vailability after DDN Failure         16.2.0           2019-12         CT#86         CP-193031         0300         1         A         Wildcard DNN         16.2.0	2019-12	CT#86	CP-193049	0265	4	В	Network Configuration Parameters in SDM	16.2.0
2019-12         CT#86         CP-193049         0269         B         Downlink Data Delivery Status Event         16.2.0           2019-12         CT#86         CP-193036         0270         2         F         Correction on notifications for AMF registration in UDM         16.2.0           2019-12         CT#86         CP-193027         0272         1         A         Nssai Inclusion Allowed         16.2.0           2019-12         CT#86         CP-193027         0280         A         Regular Expression of SuciOrSupi         16.2.0           2019-12         CT#86         CP-193027         0299         A         A vailability after DDN Failure         16.2.0           2019-12         CT#86         CP-193031         0300         1         A         Wildcard DNN         16.2.0	2019-12	CT#86	CP-193063	0266	1	В		16.2.0
2019-12         CT#86         CP-193036         0270         2         F         Correction on notifications for AMF registration in UDM         16.2.0           2019-12         CT#86         CP-193027         0272         1         A         Nssai Inclusion Allowed         16.2.0           2019-12         CT#86         CP-193027         0280         A         Regular Expression of SuciOrSupi         16.2.0           2019-12         CT#86         CP-193027         0299         A         A vailability after DDN Failure         16.2.0           2019-12         CT#86         CP-193031         0300         1         A         Wildcard DNN         16.2.0								
2019-12         CT#86         CP-193027         0272         1         A         Nssai Inclusion Allowed         16.2.0           2019-12         CT#86         CP-193027         0280         A         Regular Expression of SuciOrSupi         16.2.0           2019-12         CT#86         CP-193027         0299         A         A vailability after DDN Failure         16.2.0           2019-12         CT#86         CP-193031         0300         1         A         Wildcard DNN         16.2.0					2			
2019-12         CT#86         CP-193027         0280         A         Regular Expression of SuciOrSupi         16.2.0           2019-12         CT#86         CP-193027         0299         A         Availability after DDN Failure         16.2.0           2019-12         CT#86         CP-193031         0300         1         A         Wildcard DNN         16.2.0								
2019-12         CT#86         CP-193027         0299         A Availability after DDN Failure         16.2.0           2019-12         CT#86         CP-193031         0300         1 A Wildcard DNN         16.2.0					<del>- '</del>			
2019-12 CT#86 CP-193031 0300 1 A Wildcard DNN 16.2.0								
					- 4			
2019-12   C1#60   CP-193021   U302     A   Content Types in Nuam_EE   16.2.0					1			
	∠u19-12	C1#86	CP-19302/	0302		Α	Content Types in Nuam_EE	16.2.0

0040.40	OT#00	OD 400050	10075	1	_	AND to AME Devictorities	40.00
2019-12	CT#86	CP-193050	0275		В	NID in AMF Registration	16.2.0
2019-12	CT#86	CP-193063	0276		F	Registration Time	16.2.0
2019-12 2019-12	CT#86	CP-193053	0281 0282	1	B B	Group Identifier Translation	16.2.0 16.2.0
$\vdash$	CT#86	CP-193036			В	Updating support for subscription-based access restriction  NIDD Authorization Update Notify	
2019-12	CT#86 CT#86	CP-193049 CP-193049	0283 0284	2	В	NIDD Authorization Opdate Notify  NIDD Authorization Authorize	16.2.0
		CP-193049 CP-193063	0287	1	В	Subscription level Charging Characteristics	16.2.0
2019-12	CT#86				В		16.2.0
2019-12	CT#86	CP-193281	0288 0289	4	В	SMF Instance Id retrieval	16.2.0 16.2.0
	CT#86	CP-193280				Expected UE Behaviour parameters	16.2.0
2019-12	CT#86	CP-193046	0290	1	B B	ACS information in ParameterProvision  ACS information	
2019-12 2019-12	CT#86 CT#86	CP-193046	0291 0292	1 2	В		16.2.0 16.2.0
2019-12	CT#86	CP-193046 CP-193039	0292		В	Authentication Indication from W-AGF Indication of access from ePDG	16.2.0
2019-12	CT#86	CP-193059 CP-193057	0293	1	В	DeregistrationNotification for SMF Context Transfer	16.2.0
2019-12	CT#86	CP-193057 CP-193052	0294	1 2	В	Group Reporting Guard Time	16.2.0
2019-12	CT#86	CP-193032	0296	1	F	Add reference to TS 29.524	16.2.0
2019-12	CT#86	CP-193030 CP-193282	0297		В	Frame Routes	16.2.0
				5 2	В		
2019-12	CT#86	CP-193063	0303		F	Subscription Data Consistency with Immediate Report	16.2.0
2019-12 2019-12	CT#86	CP-193055	0305	4	F	Revisions on UDM Reference Model Figure NIDD Configuration	16.2.0
$\vdash$	CT#86	CP-193049	0306	1			16.2.0
2019-12	CT#86	CP-193054 CP-193044	0307	2	B F	Retrieval of Authentication Vectors for HSS	16.2.0
2019-12	CT#86		0310	_		API version update	16.2.0
2020-03	CT#87e	CP-200019	0244	2	В	AMF Deregistration	16.3.0
2020-03	CT#87e	CP-200039	0311	1	F	Add Corresponding API descriptions in clause 5.1  NID	16.3.0
2020-03	CT#87e	CP-200032	0312	1	F F	Copyright Note	16.3.0
2020-03	CT#87e	CP-200020	0313 0314	1	F		16.3.0
2020-03	CT#87e	CP-200020		1		References	16.3.0
2020-03	CT#87e	CP-200020	0315	2 1	F	Eps Interworking Info	16.3.0
2020-03	CT#87e	CP-200020	0317	1	г	Presence condition of monitoredResourceUris in SdmSubsModification	16.3.0
2020-03	CT#87e	CP-200176	0318	2	В	Nudm_MT service completion	16.3.0
2020-03	CT#87e	CP-200178	0319	3 1	В	Nudm_MT_ProvideLocationInfo service operation	16.3.0
2020-03	CT#87e	CP-200019	0320	1	F		16.3.0
			0320		F	Spare Data Type Definition of RgAuthenticationInfo	
2020-03	CT#87e CT#87e	CP-200020 CP-200020	0321	1 2	_г В	Clarification on SM-Data Retrieval	16.3.0 16.3.0
					F	NF deregistrations	
2020-03	CT#87e	CP-200020	0323	1	В	Supported Features in PATCH STN-SR	16.3.0
2020-03	CT#87e	CP-200019	0324	1	F		16.3.0
2020-03	CT#87e	CP-200029	0327	2		Dynamic SOR update trigger	16.3.0
2020-03	CT#87e	CP-200033	0328	1	В	Availability after DDN Failure Event	16.3.0
2020-03	CT#87e	CP-200033	0329	1	В	Configuration of Downlink data delivery status Events	16.3.0
2020-03	CT#87e	CP-200240		1	В	External Group Identifier in NIDD information	16.3.0
2020-03	CT#87e	CP-200033	0331	3	В	Retrieve the status of Enhanced Coverage Restriction	16.3.0
2020-03	CT#87e	CP-200239	0332	3	В	Subscribed eDRX and PTW value	16.3.0
2020-03	CT#87e	CP-200033	0333		В	Provision of parameters Maximum Response Time and Maximum	16.3.0
2020.02	OT#07-	CD 200000	0004	_	_	Latency Option of Brokley Dataile	4000
2020-03	CT#87e	CP-200020	0334	2	В	Optionality of ProblemDetails	16.3.0
2020-03	CT#87e	CP-200031	0335	2	В	ATSSS Support Indication in UE Subscription	16.3.0
2020-03	CT#87e	CP-200016	0336	1	В	SMF Set ID in SMF Registration	16.3.0
2020-03	CT#87e	CP-200016	0337	1	В	SMSF Set ID in SMSF Registration	16.3.0
2020-03	CT#87e	CP-200020	0338		В	SMF Registration Retrieval	16.3.0
2020-03	CT#87e	CP-200045	0339	1	В	Clarification on ODB Setting	16.3.0
2020-03	CT#87e	CP-200020	0340	1	F	Registration Time for NF Registration	16.3.0
2020-03	CT#87e	CP-200020	0341	1	В	Patch Result for partial PATCH	16.3.0
2020-03	CT#87e	CP-200020	0342		F	EpslwkPgw for EPS interworking	16.3.0
2020-03	CT#87e	CP-200031	0345		В	Update on additionalSnssaiData	16.3.0
2020-03	CT#87e	CP-200020	0346		F	DNN includes DNN NI	16.3.0
2020-03	CT#87e	CP-200039	0347	1	D	Editorial corrections	16.3.0
2020-03	CT#87e	CP-200039	0348	1	F	Correction-add type definition in the Table title	16.3.0
2020-03	CT#87e	CP-200039	0349	1	F	Correction-specify resource type in the clause title	16.3.0
2020-03	CT#87e	CP-200039	0350	1	F	Miscellaneous corrections and clarifications	16.3.0
2020-03	CT#87e	CP-200029	0352	3	В	SoR Update Indicator	16.3.0
2020-03	CT#87e	CP-200035 CP-200027	0353	1	В	SUPI pattern	16.3.0
	OT"07	ニーションロロロン /	0354	1	В	Addition of IAB-Operation Allowed indication to	16.3.0
2020-03	CT#87e	C1 -200021	I			AccessAndMobilitySubscriptionData	<u> </u>
2020-03			0055		1		4000
2020-03	CT#87e	CP-200036	0355		В	Subscription data for V2X	16.3.0
2020-03 2020-03 2020-03	CT#87e CT#87e	CP-200036 CP-200183	0357	1	F	Subscription data for V2X Initial Registration procedure on a CAG Cell	16.3.0
2020-03 2020-03 2020-03 2020-03	CT#87e CT#87e CT#87e	CP-200036 CP-200183 CP-200020	0357 0358	1	F F	Subscription data for V2X Initial Registration procedure on a CAG Cell UDM service update for the authentication result removal	16.3.0 16.3.0
2020-03 2020-03 2020-03 2020-03	CT#87e CT#87e CT#87e CT#87e	CP-200036 CP-200183 CP-200020 CP-200037	0357 0358 0359	1	F F B	Subscription data for V2X Initial Registration procedure on a CAG Cell UDM service update for the authentication result removal PDN connectivity Status event	16.3.0 16.3.0 16.3.0
2020-03 2020-03 2020-03 2020-03 2020-03 2020-03	CT#87e CT#87e CT#87e CT#87e CT#87e	CP-200036 CP-200183 CP-200020 CP-200037 CP-200018	0357 0358 0359 0360	1 1 3	F F B	Subscription data for V2X Initial Registration procedure on a CAG Cell UDM service update for the authentication result removal PDN connectivity Status event UE Location Privacy Profile Update	16.3.0 16.3.0 16.3.0 16.3.0
2020-03 2020-03 2020-03 2020-03	CT#87e CT#87e CT#87e CT#87e	CP-200036 CP-200183 CP-200020 CP-200037	0357 0358 0359	1	F F B	Subscription data for V2X Initial Registration procedure on a CAG Cell UDM service update for the authentication result removal PDN connectivity Status event	16.3.0 16.3.0 16.3.0

2020-09   CT897e   CP-200018   0386   1 B   Provision of UE LCS privacy profile								
2000-09   CTR8Fe   CP-200018   0388   1   B   VGMLC address registration   16.3.0   2020-09   CTR8Fe   CP-200020   0372   F   Attributes and its applicability for specific procedures or operations   16.3.0   2020-09   CTR8Fe   CP-200022   0374   F   Attributes and its applicability for specific procedures or operations   16.3.0   2020-07   CTR86e   CP-201033   0377   1   B   6G SRVCC Info retrieval   16.4.0   2020-07   CTR86e   CP-201033   0379   F   Aftributes and its applicability for specific procedures or operations   16.4.0   2020-07   CTR86e   CP-201034   0380   F   Epitimervolriquifito   16.4.0   2020-07   CTR86e   CP-201034   0386   F   Epitimervolriquifito   16.4.0   2020-07   CTR86e   CP-201034   0386   F   Epitimervolriquifito   16.4.0   2020-07   CTR86e   CP-201034   0386   F   Epitimervolriquifito   16.4.0   2020-07   CTR88e   CP-201034   0386   F   Supported Headers Tables for Request and Response codes   16.4.0   2020-07   CTR88e   CP-201034   0386   F   Core Network Restrictions C-verview Tables   16.4.0   2020-07   CTR88e   CP-201034   0386   F   Core Network Restrictions C-verview Tables   16.4.0   2020-07   CTR88e   CP-201034   0386   F   Core Network Restrictions   16.4.0   2020-07   CTR88e   CP-201034   0386   F   Core Network Restrictions   16.4.0   2020-07   CTR88e   CP-201035   0389   C   CUDM Author Vector Generation for HSS   16.4.0   2020-07   CTR88e   CP-201036   0380   Z   F   Clarification on Infinstanced in AuthEvent in   16.4.0   2020-07   CTR88e   CP-201036   0380   Z   F   Clarification on Infinstanced in AuthEvent in   16.4.0   2020-07   CTR88e   CP-201036   0390   Z   F   Clarification or Infinstanced in AuthEvent in   16.4.0   2020-07   CTR88e   CP-201036   0390   Z   F   Clarification or Infinstanced in AuthEvent in   16.4.0   2020-07   CTR88e   CP-201036   0396   F   Epitimer Reported National Process   16.4.0   2020-07   CTR88e   CP-201036   0396   F   Epitemer Report Information for event Lass of Connectity   16.4.0   2020-07   CTR88e   CP-201036   0396   F   Epitemer	2020-03	CT#87e	CP-200018	0365	3	В	Provision of UE LCS privacy profile	16.3.0
2020-03   CF#674   CP-200019   3989   B   PET Lipidate   10.3.0	2020-03	CT#87e		0366	1	В		16.3.0
2020-03   CT#8/Fe   CP-200052   0374   F   Attributes and its applicability for specific procedures or operations   163.0   2020-07   CT#88e   CP-201032   0377   F   API version and External doc update   164.0   2020-07   CT#88e   CP-201032   0377   F   API version and External doc update   164.0   2020-07   CT#88e   CP-201034   0380   F   EpsintervorkingInfo   164.0   2020-07   CT#88e   CP-201032   0381   F   F   AFI	2020-03	CT#87e	CP-200018	0368	1	В	VGMLC address registration	16.3.0
2020-07   CT#88e   CP_201052   3374   F   API version and External doc update   16.3.0   16.4.0   16	2020-03	CT#87e	CP-200019	0369		В	PEI Update	16.3.0
2020-07   CT#88e   CP_201052   3374   F   API version and External doc update   16.3.0   16.4.0   16	2020-03	CT#87e	CP-200020	0372		F	Attributes and its applicability for specific procedures or operations	16.3.0
2002-07   CTR88e   CP-201033   3377   1   B   5G SRVCC Info retrieval   16.4.0   1								
2020-07   CT#886   CP_201032   0397   F   Alf   16.4.0					1			
2020-07   CT#886   CP-201032   3381   F   EgainterworkingInfo   16.4.0   2020-07   CT#886   CP-201032   3382   F   VgminArdress   16.4.0   2020-07   CT#886   CP-201036   3384   F   Supported Headers Tables for Request and Response codes   16.4.0   2020-07   CT#886   CP-201036   3385   I F   Add new Notifications Overview Tables   16.4.0   2020-07   CT#886   CP-201034   3385   I F   Add new Notifications Overview Tables   16.4.0   2020-07   CT#886   CP-201034   3388   I F   Add new Notifications Overview Tables   16.4.0   2020-07   CT#886   CP-201034   3388   I F   Supported Nestrictions   16.4.0   2020-07   CT#886   CP-201034   3388   I F   SDM data resynchronization   16.4.0   2020-07   CT#886   CP-201034   3388   I F   SDM data resynchronization   16.4.0   2020-07   CT#886   CP-201036   3398   I F   SDM data resynchronization   16.4.0   2020-07   CT#886   CP-201046   3393   I F   SDM data resynchronization   16.4.0   2020-07   CT#886   CP-201047   3392   I F   Supported from niffstanced in AuthEvent in   16.4.0   2020-07   CT#886   CP-201046   3393   I B   Montoring Configuration for New Sice specific authentication and   16.4.0   2020-07   CT#886   CP-201046   3393   I B   SDM data respectively   SDM service   16.4.0   2020-07   CT#886   CP-201046   3393   I B   SDM data respectively   SDM service   16.4.0   2020-07   CT#886   CP-201046   3393   I B   SDM data respectively   SDM service   16.4.0   2020-07   CT#886   CP-201048   3398   I B   SDM data respectively   SDM service   16.4.0   2020-07   CT#886   CP-201034   3398   I B   SDM data respectively   SDM service   16.4.0   2020-07   CT#886   CP-201034   3398   I B   SDM service   SDM service   16.4.0   2020-07   CT#886   CP-201034   3398   I B   SDM service   SDM service   16.4.0   2020-07   CT#886   CP-201034   3398   I B   SDM service   SDM service   SDM service   16.4.0   2020-07   CT#886   CP-201034   3089   I B   SDM service   SDM service   SDM service   SDM service   SDM service   SDM service   SDM service   SDM service   SDM service   SDM service					-			
2020-07   CT#886   CP-201032   0381   F   CmInfoReport   16.4.0								
2020-07   CT888e   P-201056   0384   F   VgmlcAddress   16.40								
2020-07   CT888e   CP-201056   0384   1   F   Supported Headers Tables for Request and Response codes   16.4.0   2020-07   CT888e   CP-201034   0386   F   Core Network Restrictions   16.4.0   2020-07   CT888e   CP-201035   0386   F   Core Network Restrictions   16.4.0   2020-07   CT888e   CP-201034   0388   F   SDM data re-synchronization   16.4.0   2020-07   CT888e   CP-201033   0389   F   SDM data re-synchronization   16.4.0   2020-07   CT888e   CP-201033   0389   C   DM Authn. Vector Generation for HSS   16.4.0   2020-07   CT888e   CP-201056   0390   Z   F   Clarification on infinstanceld in AuthEvent in   16.4.0   2020-07   CT888e   CP-201046   0393   J   B   Feature negotiation for NW slice specific authentication and authorization   2020-07   CT888e   CP-201046   0393   J   B   Feature negotiation for NW slice specific authentication and authorization   2020-07   CT888e   CP-201046   0394   J   B   Define the value range of NB-Io-T UE priority   16.4.0   2020-07   CT888e   CP-201046   0394   J   B   Define the value range of NB-Io-T UE priority   16.4.0   2020-07   CT888e   CP-201046   0394   J   B   Define the value range of NB-Io-T UE priority   16.4.0   2020-07   CT888e   CP-201046   0394   J   B   Define the value range of NB-Io-T UE priority   16.4.0   2020-07   CT888e   CP-201034   0398   J   B   Define the value range of NB-Io-T UE priority   16.4.0   2020-07   CT888e   CP-201034   0398   J   B   Define the value range of NB-Io-T UE priority   16.4.0   2020-07   CT888e   CP-201034   0394   J   F   Support of Inter-RAT HO from NR SA to EN-DC   16.4.0   2020-07   CT888e   CP-201034   0394   J   F   Correct Cardinality of Sont Service Invocation   16.4.0   2020-07   CT888e   CP-201035   0401   J   F   DMP interpretation or handover during P-CSCF Restoration   16.4.0   2020-07   CT888e   CP-201035   0401   J   F   DMP interpretation or handover during P-CSCF Restoration   16.4.0   2020-07   CT888e   CP-201036   0401   J   F   DMP interpretation or handover during P-CSCF Restoration   16.4.0   2020-07								
2020-07   CT#88e   CP-201056   0385   1   F   Add new Notifications Overview Tables   16.4.0								
2020-07   CT#88e   P-201034   0386   F   Core Network Restrictions   16.4.0   2020-07   CT#88e   P-201035   0388   F   SDM data re-synchronization   16.4.0   2020-07   CT#88e   P-201035   0388   F   SDM data re-synchronization   16.4.0   2020-07   CT#88e   P-201056   0390   Z   F   Carrification on filnstanceld in AuthEvent in   16.4.0   2020-07   CT#88e   P-201056   0390   Z   F   Carrification on filnstanceld in AuthEvent in   16.4.0   2020-07   CT#88e   P-201047   0392   I   B   Feature negotiation for NW slice specific authentication and authorization   2020-07   2020-07   CT#88e   P-201046   0393   I   B   Define the value range of NB-IoT UE priority   16.4.0   2020-07   CT#88e   P-201046   0394   3   B   Monitoring Configuration for revent Loss of Connectivity   16.4.0   2020-07   CT#88e   P-201046   0394   3   B   Monitoring Configuration for event Loss of Connectivity   16.4.0   2020-07   CT#88e   P-201036   0396   I   F   Support of inter-RAT HO from NR SA to EN-DC   16.4.0   2020-07   CT#88e   P-201032   0397   Z   F   Correct the definition of LOS Privacy in SDM service   16.4.0   2020-07   CT#88e   P-201033   0400   I   F   POPG Indication in UeContextInsmiDiata   16.4.0   2020-07   CT#88e   P-201034   0401   I   F   UBM Initiated AUSF Service Invocation   16.4.0   2020-07   CT#88e   P-201034   0401   I   F   UBM Initiated AUSF Service Invocation   16.4.0   2020-07   CT#88e   P-201035   0402   I   B   Secondary Authentication and Authorization Information in 5G NN   16.4.0   2020-07   CT#88e   P-201035   0401   I   F   UBM Initiated AUSF Service Invocation   16.4.0   2020-07   CT#88e   P-201036   0401   I   F   UBM Initiated AUSF Service Invocation   16.4.0   2020-07   CT#88e   P-201036   0401   I   F   DIFF SERVICE Invocation   16.4.0   2020-07   CT#88e   P-201036   0401   I   F   Notification of Indication Information in 5G NN   16.4.0   2020-07   CT#88e   P-201046   0404   I   F   Notification of Indication Information in 5G NN   16.4.0   2020-07   CT#88e   P-201046   0404   I   F   Notificatio					1			
10.20-07   CTH886   CP-201034   0.388   F   SDM data re-synchronization   16.4.0	2020-07	CT#88e	CP-201056	0385	1	F	Add new Notifications Overview Tables	16.4.0
2020-07   CTH88e   CP-201056   0390   2   F   County   CTH88e   CP-201056   0390   2   F   Clarification on rifinstanceld in AuthEvent in   16.40   2020-07   CTH88e   CP-201047   0392   1   B   Feature negotiation for NW siles specific authentication and authorization   16.40   2020-07   CTH88e   CP-201046   0393   1   B   Define the value range of NB-IoT UE priority   16.40   2020-07   CTH88e   CP-201046   0394   3   B   Monitoring Configuration for event Loss of Connectivity   16.40   2020-07   CTH88e   CP-201056   0396   1   F   Support of Inter-RAT HO from NR SA to EN-DC   16.40   2020-07   CTH88e   CP-201032   0397   2   F   Correct the definition of U.S Privacy in SISM service   16.40   2020-07   CTH88e   CP-201034   0398   1   B   Ongoing registration or handwore during P-CSCF Restoration   16.40   2020-07   CTH88e   CP-201035   0400   1   F   SPDG Indication in UEContextinSmfData   16.40   2020-07   CTH88e   CP-201035   0400   1   F   SPDG Indication in UEContextinSmfData   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication and Authorization Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication and Authorization Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication in Authorization Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0410   1   F   Add Declaration Information In Secondary Authentication Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0411   1   F   Add Declaration Information Information in SG VN   16.40   2020-07   CTH88e   CP-201035   041	2020-07	CT#88e	CP-201034	0386		F	Core Network Restrictions	16.4.0
2020-07   CTH88e   CP-201056   0390   2   F   County   CTH88e   CP-201056   0390   2   F   Clarification on rifinstanceld in AuthEvent in   16.40   2020-07   CTH88e   CP-201047   0392   1   B   Feature negotiation for NW siles specific authentication and authorization   16.40   2020-07   CTH88e   CP-201046   0393   1   B   Define the value range of NB-IoT UE priority   16.40   2020-07   CTH88e   CP-201046   0394   3   B   Monitoring Configuration for event Loss of Connectivity   16.40   2020-07   CTH88e   CP-201056   0396   1   F   Support of Inter-RAT HO from NR SA to EN-DC   16.40   2020-07   CTH88e   CP-201032   0397   2   F   Correct the definition of U.S Privacy in SISM service   16.40   2020-07   CTH88e   CP-201034   0398   1   B   Ongoing registration or handwore during P-CSCF Restoration   16.40   2020-07   CTH88e   CP-201035   0400   1   F   SPDG Indication in UEContextinSmfData   16.40   2020-07   CTH88e   CP-201035   0400   1   F   SPDG Indication in UEContextinSmfData   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication and Authorization Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication and Authorization Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication in Authorization Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0402   1   B   Secondary Authentication Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0410   1   F   Add Declaration Information In Secondary Authentication Information in SG VN   16.40   2020-07   CTH88e   CP-201035   0411   1   F   Add Declaration Information Information in SG VN   16.40   2020-07   CTH88e   CP-201035   041	2020-07	CT#88e	CP-201067	0387	1	В	MDT user consent	16.4.0
2020-07   CTH886   CP-201033   03899   C   UDM Authn. Vector Generation for HSS   16.40   2020-07   CTH886   CP-201046   0393   2   F   Clarification on Inflastancel in AuthEventin   16.40   2020-07   CTH886   CP-201046   0393   1   B   Feature regotation for NW slice specific authentication and authorization   16.40   2020-07   CTH886   CP-201046   03934   3   B   Monitorization   16.40   2020-07   CTH886   CP-201046   0394   3   B   Monitorization for event Loss of Connectivity   16.40   2020-07   CTH886   CP-201032   0397   2   F   Correct the definition of LCS Privacy in SDM service   16.40   2020-07   CTH886   CP-201032   0397   2   F   Correct the definition of LCS Privacy in SDM service   16.40   2020-07   CTH886   CP-201034   0398   1   B   Department of the Privacy in SDM service   16.40   2020-07   CTH886   CP-201034   0400   1   F   UDM Initiated AUST Service Invocation   16.40   2020-07   CTH886   CP-201034   0401   1   F   UDM Initiated AUST Service Invocation   16.40   2020-07   CTH886   CP-201034   0401   1   F   UDM Initiated AUST Service Invocation   16.40   2020-07   CTH886   CP-201034   0401   1   F   UDM Initiated AUST Service Invocation   16.40   2020-07   CTH886   CP-201034   0403   F   Clarification of Implicit Unsubscribe   CP-201034   0403   F   Clarification of Implicit Unsubscribe   CP-201034   0403   F   Clarification of Implicit Unsubscribe   CP-201034   0400   F   Notification Correlation ID in sub-ontity of EE service   16.40   2020-07   CTH886   CP-201046   0404   F   Notification Correlation ID in sub-ontity of EE service   16.40   2020-07   CTH886   CP-201046   0410   F   Notification Correlation ID in Sub-ontity of EE service   16.40   2020-07   CTH886   CP-201046   0410   F   Notification Correlation Subscription Change Indicator in   16.40   2020-07   CTH886   CP-201046   0410   F   Notification Correlation Subscription Change Indicator in   16.40   2020-07   CTH886   CP-201046   0410   F   Notification Correlation Subscription Change Indicator in   16.40   2020-07   CTH88						F	SDM data re-synchronization	16.4.0
2020-07   CT#88e   CP-201047   0392   1   B   Feature negotiation on rInstanced in AuthEvent in Nudm UEAuthentication   16.40   2020-07   CT#88e   CP-201046   0393   1   B   Feature negotiation for NW slice specific authentication and authorization   16.40   2020-07   CT#88e   CP-201046   0393   1   B   Define the value range of NB-IoT UE priority   16.4.0   2020-07   CT#88e   CP-201056   0396   1   F   Support of inter-RAT HO from NR SA to EN-DC   16.40   2020-07   CT#88e   CP-201032   0397   2   F   Correct the definition of LCS Privacy in SDM service   16.4.0   2020-07   CT#88e   CP-201034   0398   1   B   Ongoing registration or handwore during P-CSCF Restoration   16.4.0   2020-07   CT#88e   CP-201035   0400   1   F   EPDG Indication in UEContextifs-mitoral   16.4.0   2020-07   CT#88e   CP-201035   0400   1   F   EPDG Indication in UEContextifs-mitoral   16.4.0   2020-07   CT#88e   CP-201035   0400   1   F   EPDG Indication in UEContextifs-mitoral   16.4.0   2020-07   CT#88e   CP-201035   0402   1   B   EPDG Indication in UEContextifs-mitoral   16.4.0   2020-07   CT#88e   CP-201035   0402   1   B   EPDG Indication in UEContextifs-mitoral   16.4.0   2020-07   CT#88e   CP-201035   0402   1   B   EPDG Indication in UEContextifs-mitoral   16.4.0   2020-07   CT#88e   CP-201035   0402   1   B   EPDG Indication in UEContextifs-mitoral   16.4.0   2020-07   CT#88e   CP-201035   0402   1   B   EPDG Indication in UEContextifs-mitoral   16.4.0   2020-07   CT#88e   CP-201035   0407   1   B   HSS Authentication Info Request   16.4.0   2020-07   CT#88e   CP-201036   0411   F   EVERAGE   CP-201045   0412   F   EVERAGE   CP-201045   0412   F   EVERAGE   CP-201045   0412   F   EVERAGE   CP-201045   0412   F   Add a CAG information in Subscription Data   16.4.0   2020-07   CT#88e   CP-201045   0412   F   EVERAGE   CP-201045   0412   F   Add a CAG information Subscription Catal part   16.4.0   2020-07   CT#88e   CP-201045   0412   F   EVERAGE   CP-201045   0412   F   EVERAGE   CP-201045   0412   F   EVERAGE   CP-201045   04								
Nudm   UEAuthentication   Nudm   UEAuthentication   Nudm   UEAuthentication   Number   Numb					2			
2020-07   CT#88e   CP-201046   0392   1   B   Feature negotiation for NW slice specific authentication and a Burborization   Burborization	2020-07	C1#006	C1 -201030	0330	_			10.4.0
authorization	2020.07	CT#000	CD 201047	0202	1	D	Footure pogetiation for NW alice apositic authentication and	16.4.0
2020-07   CT#88e   CP-201046   0393   1   B   Define the value range of NB-IoT LE priority   16.4.0   2020-07   CT#88e   CP-201056   0398   1   F   Support of inter-RAT HO from NR SA to EN-PC   16.4.0   2020-07   CT#88e   CP-201032   0397   2   F   Correct the definition of LCS Privacy in SDM service   16.4.0   2020-07   CT#88e   CP-201034   0398   1   B   Ongoing registration of LSC Privacy in SDM service   16.4.0   2020-07   CT#88e   CP-201034   0398   1   B   Ongoing registration of LSC Privacy in SDM service   16.4.0   2020-07   CT#88e   CP-201034   0401   1   F   DIDM Initiated AUSF Service Invocation   16.4.0   2020-07   CT#88e   CP-201034   0401   1   F   UDM Initiated AUSF Service Invocation   16.4.0   2020-07   CT#88e   CP-201034   0403   F   Carrect Cardinality of sortinicExpectation   16.4.0   2020-07   CT#88e   CP-201034   0403   F   Carrect Cardinality of sortinicExpectation   16.4.0   2020-07   CT#88e   CP-201034   0403   F   Carrect Cardinality of sortinicExpectation   16.4.0   2020-07   CT#88e   CP-201034   0403   F   Carrect Cardinality of Service Invocation Information in SG VN   2020-07   CT#88e   CP-201035   0404   1   F   Notification Correlation ID in sub-notify of EE service   16.4.0   2020-07   CT#88e   CP-201039   0404   1   F   Notification Correlation ID in sub-notify of EE service   16.4.0   2020-07   CT#88e   CP-201039   0408   3   B   UE Reachability for SM   S   2020-07   CT#88e   CP-201056   0410   1   F   Datatype column in Resource URI variables Table   16.4.0   2020-07   CT#88e   CP-201046   0416   1   B   Report of UE Max availability time   2020-07   CT#88e   CP-201046   0416   1   B   Report of UE Max availability time   2020-07   CT#88e   CP-201046   0416   1   B   Report of UE Max availability time   2020-07   CT#88e   CP-201046   0416   1   B   Report of UE Max availability time   2020-07   CT#88e   CP-201046   0416   1   B   Report of UE Max availability time   2020-07   CT#88e   CP-201046   0416   1   B   DECM multiple registration data sets retrieval   16.4.0   2020	2020-07	C1#666	CP-201047	0392	'	Ь		16.4.0
2020-07   CT#88e   CP-201056   0394   3   8   Monitoring Configuration for event Loss of Connectivity   16.4.0	2022 27	OT#00-	OD 004040	0000	<b>—</b>	_		40.40
2020-07   CT#886   CP-201032   0396   1   F   Support of Inter-RAT HD from NR SA to ENDC   16.4.0								
2020-07   CT#88e   CP-201034   0397   2   F   Correct the definition of LOS Privacy in SDM service   16.4.0								
2020-07   CT#88e   CP-201042   398   1								
2020-07   CT#88e   CP-201034   0400   1   F   EPG Indication in UeContextInSmfData   16.4.0								
2020-07   CT#88e   CP-201034   O400   1   F   ePDG Indication in UeContextInSmfData   16.4.0	2020-07	CT#88e	CP-201034	0398	1	В		16.4.0
2020-07   CT#88e   CP-201034   O400   1   F   ePDG Indication in UeContextInSmfData   16.4.0	2020-07	CT#88e	CP-201042	0399		F	Correct Cardinality of sorInfoExpectInd	16.4.0
2020-07   CT#88e   CP-201045   0401   1   F   UDM Initiated AUSF Service Invocation   16.4.0					1	F		16.4.0
2020-07   CT#88e   CP-201034   0403   F   Clarification of Implicit Unsubscribe   16.4.0								
Corup Data								
2020-07   CT#88e   CP-201034   0403   F   Clarification of Implicit Unsubscribe   16.4.0   2020-07   CT#88e   CP-201033   0407   1   B   HSS Authentication ID in sub-notify of EE service   16.4.0   2020-07   CT#88e   CP-201039   0408   3   B   UE Reachability Event   16.4.0   2020-07   CT#88e   CP-201056   0410   1   F   Datatype column in Resource URI variables Table   16.4.0   2020-07   CT#88e   CP-201056   0410   1   F   Datatype column in Resource URI variables Table   16.4.0   2020-07   CT#88e   CP-201056   0411   1   F   Add Operation Name column in Custom Operations table   16.4.0   2020-07   CT#88e   CP-201045   0412   1   F   Add operation Name column in Custom Operations table   16.4.0   AccessAndMobilitySubscriptionData   CT#88e   CP-201046   0416   1   B   Report of UE Max availability time   16.4.0   AccessAndMobilitySubscriptionData   CT#88e   CP-201034   0417   1   B   UECM multiple registration data sets retrieval   16.4.0   2020-07   CT#88e   CP-201034   0417   1   B   UECM multiple registration data sets retrieval   16.4.0   2020-07   CT#88e   CP-201034   0420   1   F   Implicit Unsubscribe   16.4.0   2020-07   CT#88e   CP-201034   0417   1   B   MDT Configuration data for 5G   16.4.0   2020-07   CT#88e   CP-201042   0325   2   B   SoR Info parameter Provisioning   16.4.0   2020-07   CT#88e   CP-201034   0383   2   F   PEI   16.4.0   2020-07   CT#88e   CP-201042   0325   2   B   SoR Info parameter Provisioning   16.4.0   2020-07   CT#88e   CP-201044   0424   F   Elst of specific data types   16.4.0   2020-07   CT#88e   CP-201044   0424   F   Elst of specific data types   16.4.0   2020-07   CT#88e   CP-201044   0425   F   F   El Context in AMF Data   16.4.0   2020-07   CT#88e   CP-201044   0424   F   Elst of specific data types   16.4.0   2020-07   CT#88e   CP-201048   0424   F   Elst of specific data types   16.4.0   2020-07   CT#88e   CP-201048   0430   F   Retrieval of multiple data sets   16.4.0   2020-07   CT#88e   CP-201048   0434   F   Elst of specific data types   16.4.0   2020-07   C	2020 07	01//000	01 2010-10	0402				10.4.0
2020-07   CT#88e   CP-201046   0404	2020.07	CT#000	CD 201024	0402				16.4.0
2020-07   CT#88e   CP-201033   0407   1 B   HSS Authentication Info Request   16.4.0   2020-07   CT#88e   CP-201019   0408   3 B   UE Reachability Event   16.4.0   2020-07   CT#88e   CP-201019   0409   3 F   UE Reachability For SMS   16.4.0   2020-07   CT#88e   CP-201056   0410   1 F   Datatype column in Resource URI variables Table   16.4.0   2020-07   CT#88e   CP-201045   0411   1 F   Add Operation Name column in Custom Operations table   16.4.0   2020-07   CT#88e   CP-201046   0416   1 B   Report of UE Max availability fume   16.4.0   2020-07   CT#88e   CP-201046   0416   1 B   Report of UE Max availability fume   16.4.0   2020-07   CT#88e   CP-201034   0417   1 B   UECM multiple registration data sets retrieval   16.4.0   2020-07   CT#88e   CP-201034   0420   1 F   Implicit Unsubscribe   16.4.0   2020-07   CT#88e   CP-201034   0420   1 F   Implicit Unsubscribe   16.4.0   2020-07   CT#88e   CP-201034   0420   1 F   Implicit Unsubscribe   16.4.0   2020-07   CT#88e   CP-201034   0420   1 F   Implicit Unsubscribe   16.4.0   2020-07   CT#88e   CP-201034   0420   1 F   Implicit Unsubscribe   16.4.0   2020-07   CT#88e   CP-201034   0383   2 F   PEI   16.4.0   2020-07   CT#88e   CP-201034   0383   2 F   PEI   16.4.0   2020-07   CT#88e   CP-201034   0383   2 F   PEI   16.4.0   2020-07   CT#88e   CP-201034   0383   2 F   PEI   16.4.0   2020-07   CT#88e   CP-201034   0383   2 F   PEI   16.4.0   2020-07   CT#88e   CP-201034   0424   F   Uist of specific data types   16.4.0   2020-07   CT#88e   CP-201034   0425   F   NID in AMF-registrations   16.4.0   2020-07   CT#88e   CP-201034   0425   F   NID in AMF-registrations   16.4.0   2020-07   CT#88e   CP-201034   0425   F   NID in AMF-registrations   16.4.0   2020-07   CT#88e   CP-201034   0436   F   Retrieval of multiple data sets   16.4.0   2020-07   CT#88e   CP-201030   0431   F   DeregistrationData   16.4.0   2020-07   CT#88e   CP-201030   0431   F   Removal of MG-TMBR   CF-201034   0430   T   Retrieval of multiple registrations   16.4.0   2020-07   CT#88e   CP-201034					- 1			
2020-07   CT#88e   CP-201019   0408   3   B   UE Reachability Event   16.4.0   2020-07   CT#88e   CP-201056   0410   1   F   Datatype column in Resource URI variables Table   16.4.0   2020-07   CT#88e   CP-201056   0411   1   F   Add Operation Name column in Custom Operations table   16.4.0   2020-07   CT#88e   CP-201045   0412   1   F   Add Operation Name column in Custom Operations table   16.4.0   2020-07   CT#88e   CP-201046   0416   1   B   Report of UE Max availability time   16.4.0   2020-07   CT#88e   CP-201032   0418   1   F   OpenAPI file description on Registration data sets retrieval   16.4.0   2020-07   CT#88e   CP-201032   0418   1   F   OpenAPI file description on Registration CustomInfo data type   16.4.0   2020-07   CT#88e   CP-201034   0420   1   F   Implicit Unsubscribe   16.4.0   2020-07   CT#88e   CP-201042   0325   2   B   SoR Info parameter Provisioning   16.4.0   2020-07   CT#88e   CP-201042   0325   2   B   SoR Info parameter Provisioning   16.4.0   2020-07   CT#88e   CP-201042   0325   2   B   SoR Info parameter Provisioning   16.4.0   2020-07   CT#88e   CP-201044   0423   1   F   UE Context in AMF Data   16.4.0   2020-07   CT#88e   CP-201034   0423   1   F   UE Context in AMF Data   16.4.0   2020-07   CT#88e   CP-201034   0423   1   F   UE Context in AMF Data   16.4.0   2020-07   CT#88e   CP-201034   0427   F   Retrieval of multiple data sets   16.4.0   2020-07   CT#88e   CP-201034   0427   F   Retrieval of multiple data sets   16.4.0   2020-07   CT#88e   CP-201034   0439   1   A   Correct Data Type Names   16.4.0   2020-07   CT#88e   CP-201034   0437   F   Retrieval of multiple data sets   16.4.0   2020-07   CT#88e   CP-201034   0439   1   A   Correct Data Type Names   16.4.0   2020-07   CT#88e   CP-201030   0431   F   DeregistrationData   16.4.0   2020-07   CT#88e   CP-201030   0431   F   PeregistrationData   16.4.0   2020-07   CT#88e   CP-201030   0434   1   A   Shared Data Clarification   16.4.0   2020-07   CT#88e   CP-201032   0444   1   B   Timer needed for the SOR-AF to respo								
2020-07   CT#88e   CP-201056   0410   1   F Datatype column in Resource URI variables Table   16.4.0								
2020-07   CT#88e   CP-201056   O410							·	
2020-07   CT#88e   CP-201045   0412								
2020-07   CT#88e   CP-201045   0412   1   F   Add a CAG information Subscription Change Indicator in AccessAndMobilitySubscription Change Indicator in Indicator In B Report of UE Max availability time	2020-07	CT#88e	CP-201056	0410	1	F	Datatype column in Resource URI variables Table	16.4.0
AccessAndMobilitySubscriptionData   2020-07   CT#88e   CP-201046   O416   1   B   Report of UE Max availability time   16.4.0	2020-07	CT#88e	CP-201056	0411	1	F	Add Operation Name column in Custom Operations table	16.4.0
AccessAndMobilitySubscriptionData   C2020-07 CT#88e   CP-201046   O416   1 B   Report of UE Max availability time   16.4.0	2020-07	CT#88e	CP-201045	0412	1	F	Add a CAG information Subscription Change Indicator in	16.4.0
December   CT#88e   CP-201034   0417   1   B   UECM multiple registration data sets retrieval   16.4.0   2020-07   CT#88e   CP-201032   0418   1   F   OpenAPI file description on RegistrationLocationInfo data type   16.4.0   2020-07   CT#88e   CP-201067   0421   1   B   MDT Configuration data for 5G   16.4.0   2020-07   CT#88e   CP-201042   0325   2   B   SoR Info parameter Provisioning   16.4.0   2020-07   CT#88e   CP-201034   0383   2   F   PEI   16.4.0   2020-07   CT#88e   CP-201034   0383   2   F   PEI   16.4.0   2020-07   CT#88e   CP-201191   0415   3   F   HTTP Header storage in UDR   16.4.0   2020-07   CT#88e   CP-201196   0423   1   F   UE Context in AMF Data   16.4.0   2020-07   CT#88e   CP-201034   0424   F   List of specific data types   16.4.0   2020-07   CT#88e   CP-201034   0425   F   NID in AMF-registrations   16.4.0   2020-07   CT#88e   CP-201034   0427   F   Retrieval of multiple data sets   16.4.0   2020-07   CT#88e   CP-201034   0427   F   Retrieval of multiple data sets   16.4.0   2020-07   CT#88e   CP-201034   0427   F   Retrieval of multiple data sets   16.4.0   2020-07   CT#88e   CP-201034   0430   1   B   NGGC device Authentication   16.4.0   2020-07   CT#88e   CP-201030   0431   F   DeregistrationData   16.4.0   2020-07   CT#88e   CP-201030   0431   F   DeregistrationData   16.4.0   2020-07   CT#88e   CP-201046   0436   1   F   Removal of RG-TMBR   16.4.0   2020-07   CT#88e   CP-201046   0436   1   F   Removal of RG-TMBR   16.4.0   2020-07   CT#88e   CP-201046   0436   1   F   Removal of RG-TMBR   16.4.0   2020-07   CT#88e   CP-201046   0436   1   F   Removal of RG-TMBR   16.4.0   2020-07   CT#88e   CP-201046   0436   1   F   Removal of RG-TMBR   16.4.0   2020-07   CT#88e   CP-201046   0445   3   F   ImplicitUnsubscribe for SMF   16.4.0   2020-07   CT#88e   CP-201042   0441   1   B   Implementing LCS Broadcast Assistance API   16.4.0   2020-07   CT#88e   CP-201042   0441   1   B   Implementing LCS Broadcast Assistance API   16.4.0   2020-07   CT#88e   CP-201045   0446   F   Miscellane							AccessAndMobilitySubscriptionData	
December   CT#88e   CP-201034   0417   1   B   UECM multiple registration data sets retrieval   16.4.0   2020-07   CT#88e   CP-201032   0418   1   F   OpenAPI file description on RegistrationLocationInfo data type   16.4.0   2020-07   CT#88e   CP-201067   0421   1   B   MDT Configuration data for 5G   16.4.0   2020-07   CT#88e   CP-201042   0325   2   B   SoR Info parameter Provisioning   16.4.0   2020-07   CT#88e   CP-201034   0383   2   F   PEI   16.4.0   2020-07   CT#88e   CP-201034   0383   2   F   PEI   16.4.0   2020-07   CT#88e   CP-201191   0415   3   F   HTTP Header storage in UDR   16.4.0   2020-07   CT#88e   CP-201196   0423   1   F   UE Context in AMF Data   16.4.0   2020-07   CT#88e   CP-201034   0424   F   List of specific data types   16.4.0   2020-07   CT#88e   CP-201034   0425   F   NID in AMF-registrations   16.4.0   2020-07   CT#88e   CP-201034   0427   F   Retrieval of multiple data sets   16.4.0   2020-07   CT#88e   CP-201034   0427   F   Retrieval of multiple data sets   16.4.0   2020-07   CT#88e   CP-201034   0427   F   Retrieval of multiple data sets   16.4.0   2020-07   CT#88e   CP-201034   0430   1   B   NGGC device Authentication   16.4.0   2020-07   CT#88e   CP-201030   0431   F   DeregistrationData   16.4.0   2020-07   CT#88e   CP-201030   0431   F   DeregistrationData   16.4.0   2020-07   CT#88e   CP-201046   0436   1   F   Removal of RG-TMBR   16.4.0   2020-07   CT#88e   CP-201046   0436   1   F   Removal of RG-TMBR   16.4.0   2020-07   CT#88e   CP-201046   0436   1   F   Removal of RG-TMBR   16.4.0   2020-07   CT#88e   CP-201046   0436   1   F   Removal of RG-TMBR   16.4.0   2020-07   CT#88e   CP-201046   0436   1   F   Removal of RG-TMBR   16.4.0   2020-07   CT#88e   CP-201046   0445   3   F   ImplicitUnsubscribe for SMF   16.4.0   2020-07   CT#88e   CP-201042   0441   1   B   Implementing LCS Broadcast Assistance API   16.4.0   2020-07   CT#88e   CP-201042   0441   1   B   Implementing LCS Broadcast Assistance API   16.4.0   2020-07   CT#88e   CP-201045   0446   F   Miscellane	2020-07	CT#88e	CP-201046	0416	1	В		16.4.0
2020-07   CT#88e   CP-201032   0418   1   F   OpenAPI file description on RegistrationLocationInfo data type   16.4.0   2020-07   CT#88e   CP-201034   0420   1   F   Implicit Unsubscribe   16.4.0   2020-07   CT#88e   CP-201067   0421   1   B   MDT Configuration data for 5G   16.4.0   2020-07   CT#88e   CP-201042   0325   2   B   SoR Info parameter Provisioning   16.4.0   2020-07   CT#88e   CP-201034   0383   2   F   PEI								
2020-07         CT#88e         CP-201034         0420         1         F         Implicit Unsubscribe         16.4.0           2020-07         CT#88e         CP-201067         0421         1         B         MDT Configuration data for 5G         16.4.0           2020-07         CT#88e         CP-201034         0383         2         F         PEI         16.4.0           2020-07         CT#88e         CP-201191         0415         3         F         HTTP Header storage in UDR         16.4.0           2020-07         CT#88e         CP-201176         0423         1         F         UE Context in AMF Data         16.4.0           2020-07         CT#88e         CP-201045         0425         F         NID in AMF-registrations         16.4.0           2020-07         CT#88e         CP-201045         0425         F         NID in AMF-registrations         16.4.0           2020-07         CT#88e         CP-201049         0427         F         Retrieval of multiple data sets         16.4.0           2020-07         CT#88e         CP-201048         0430         1         A         Correct Data Type Names         16.4.0           2020-07         CT#88e         CP-201030         0431         F							ı ü	
Description   CT#88e   CP-201067   O421   1   B   MDT Configuration data for 5G   16.4.0   2020-07   CT#88e   CP-201042   O325   2   B   SoR Info parameter Provisioning   16.4.0   16.4.0   2020-07   CT#88e   CP-201034   O383   2   F   PEI								
2020-07         CT#88e         CP-201042         0325         2         B         SoR Info parameter Provisioning         16.4.0           2020-07         CT#88e         CP-201034         0383         2         F         PEI         16.4.0           2020-07         CT#88e         CP-201191         0415         3         F         HTTP Header storage in UDR         16.4.0           2020-07         CT#88e         CP-201034         0424         F         UE Context in AMF Data         16.4.0           2020-07         CT#88e         CP-201034         0424         F         List of specific data types         16.4.0           2020-07         CT#88e         CP-201045         0425         F         NID in AMF-registrations         16.4.0           2020-07         CT#88e         CP-201034         0427         F         Retrieval of multiple data sets         16.4.0           2020-07         CT#88e         CP-201048         0430         1         B         N5GC device Authentication         16.4.0           2020-07         CT#88e         CP-201048         0430         1         B         N5GC device Authentication         16.4.0           2020-07         CT#88e         CP-201030         0431         F								
2020-07         CT#88e         CP-201034         0383         2         F         PEI         16.4.0           2020-07         CT#88e         CP-201191         0415         3         F         HTTP Header storage in UDR         16.4.0           2020-07         CT#88e         CP-201034         0424         F         List of specific data types         16.4.0           2020-07         CT#88e         CP-201034         0425         F         NID in AMF-registrations         16.4.0           2020-07         CT#88e         CP-201034         0427         F         Retrieval of multiple data sets         16.4.0           2020-07         CT#88e         CP-201049         0429         1         A         Correct Data Type Names         16.4.0           2020-07         CT#88e         CP-201048         0430         1         B         NSGC device Authentication         16.4.0           2020-07         CT#88e         CP-201030         0431         F         DeregistrationData         16.4.0           2020-07         CT#88e         CP-201049         0434         1         A         Shared Data Clarification         16.4.0           2020-07         CT#88e         CP-201048         0436         1         F								
2020-07         CT#88e         CP-201191         0415         3         F         HTTP Header storage in UDR         16.4.0           2020-07         CT#88e         CP-201176         0423         1         F         UE Context in AMF Data         16.4.0           2020-07         CT#88e         CP-201034         0424         F         List of specific data types         16.4.0           2020-07         CT#88e         CP-201045         0425         F         NID in AMF-registrations         16.4.0           2020-07         CT#88e         CP-201034         0427         F         Retrieval of multiple data sets         16.4.0           2020-07         CT#88e         CP-201019         0429         1         A         Correct Data Type Names         16.4.0           2020-07         CT#88e         CP-201048         0430         1         B         NSGC device Authentication         16.4.0           2020-07         CT#88e         CP-201030         0431         F         DeregistrationData         16.4.0           2020-07         CT#88e         CP-201048         0436         1         F         Removal of RG-TMBR         16.4.0           2020-07         CT#88e         CP-201046         0437         F								
2020-07         CT#88e         CP-201176         0423         1         F         UE Context in AMF Data         16.4.0           2020-07         CT#88e         CP-201034         0424         F         List of specific data types         16.4.0           2020-07         CT#88e         CP-201034         0425         F         NID in AMF-registrations         16.4.0           2020-07         CT#88e         CP-201034         0427         F         Retrieval of multiple data sets         16.4.0           2020-07         CT#88e         CP-201019         0429         1         A         Correct Data Type Names         16.4.0           2020-07         CT#88e         CP-201048         0430         1         B         NSGC device Authentication         16.4.0           2020-07         CT#88e         CP-201030         0431         F         DeregistrationData         16.4.0           2020-07         CT#88e         CP-201048         0436         1         F         Removal of RG-TMBR         16.4.0           2020-07         CT#88e         CP-201048         0436         1         F         Removal of RG-TMBR         16.4.0           2020-07         CT#88e         CP-201056         0437         F         RA								
2020-07         CT#88e         CP-201034         0424         F         List of specific data types         16.4.0           2020-07         CT#88e         CP-201045         0425         F         NID in AMF-registrations         16.4.0           2020-07         CT#88e         CP-201034         0427         F         Retrieval of multiple data sets         16.4.0           2020-07         CT#88e         CP-201019         0429         1         A         Correct Data Type Names         16.4.0           2020-07         CT#88e         CP-201048         0430         1         B         NSGC device Authentication         16.4.0           2020-07         CT#88e         CP-201030         0431         F         DeregistrationData         16.4.0           2020-07         CT#88e         CP-201091         0434         1         A         Shared Data Clarification         16.4.0           2020-07         CT#88e         CP-201048         0436         1         F         Removal of RG-TMBR         16.4.0           2020-07         CT#88e         CP-201056         0437         F         RAT Type Restriction         16.4.0           2020-07         CT#88e         CP-201034         0449         3         F         <					3	F		
2020-07         CT#88e         CP-201045         0425         F         NID in AMF-registrations         16.4.0           2020-07         CT#88e         CP-201034         0427         F         Retrieval of multiple data sets         16.4.0           2020-07         CT#88e         CP-201019         0429         1         A         Correct Data Type Names         16.4.0           2020-07         CT#88e         CP-201030         0431         F         DeregistrationData         16.4.0           2020-07         CT#88e         CP-201019         0434         1         A         Shared Data Clarification         16.4.0           2020-07         CT#88e         CP-201048         0436         1         F         Removal of RG-TMBR         16.4.0           2020-07         CT#88e         CP-201056         0437         F         RAT Type Restriction         16.4.0           2020-07         CT#88e         CP-201056         0438         F         implicitUnsubscribe for SMF         16.4.0           2020-07         CT#88e         CP-201034         0439         1         F         Authentication results for multiple registrations         16.4.0           2020-07         CT#88e         CP-201042         0440         3	2020-07	CT#88e	CP-201176	0423	1	F	UE Context in AMF Data	16.4.0
2020-07         CT#88e         CP-201045         0425         F         NID in AMF-registrations         16.4.0           2020-07         CT#88e         CP-201034         0427         F         Retrieval of multiple data sets         16.4.0           2020-07         CT#88e         CP-201019         0429         1         A         Correct Data Type Names         16.4.0           2020-07         CT#88e         CP-201030         0431         F         DeregistrationData         16.4.0           2020-07         CT#88e         CP-201019         0434         1         A         Shared Data Clarification         16.4.0           2020-07         CT#88e         CP-201048         0436         1         F         Removal of RG-TMBR         16.4.0           2020-07         CT#88e         CP-201056         0437         F         RAT Type Restriction         16.4.0           2020-07         CT#88e         CP-201056         0438         F         implicitUnsubscribe for SMF         16.4.0           2020-07         CT#88e         CP-201034         0439         1         F         Authentication results for multiple registrations         16.4.0           2020-07         CT#88e         CP-201042         0440         3	2020-07	CT#88e	CP-201034	0424		F	List of specific data types	16.4.0
2020-07         CT#88e         CP-201034         0427         F         Retrieval of multiple data sets         16.4.0           2020-07         CT#88e         CP-201019         0429         1         A         Correct Data Type Names         16.4.0           2020-07         CT#88e         CP-201048         0430         1         B         N5GC device Authentication         16.4.0           2020-07         CT#88e         CP-201030         0431         F         DeregistrationData         16.4.0           2020-07         CT#88e         CP-201048         0436         1         F         Removal of RG-TMBR         16.4.0           2020-07         CT#88e         CP-201056         0437         F         RAT Type Restriction         16.4.0           2020-07         CT#88e         CP-201056         0437         F         RAT Type Restriction         16.4.0           2020-07         CT#88e         CP-201034         0439         1         F         Authentication results for multiple registrations         16.4.0           2020-07         CT#88e         CP-201342         0440         3         F         Corrections of Enhance Coverage Restriction         16.4.0           2020-07         CT#88e         CP-201042         04								
2020-07         CT#88e         CP-201019         0429         1         A         Correct Data Type Names         16.4.0           2020-07         CT#88e         CP-201048         0430         1         B         N5GC device Authentication         16.4.0           2020-07         CT#88e         CP-201030         0431         F         DeregistrationData         16.4.0           2020-07         CT#88e         CP-201048         0436         1         F         Removal of RG-TMBR         16.4.0           2020-07         CT#88e         CP-201056         0437         F         RAT Type Restriction         16.4.0           2020-07         CT#88e         CP-201056         0438         F         implicitUnsubscribe for SMF         16.4.0           2020-07         CT#88e         CP-201034         0439         1         F         Authentication results for multiple registrations         16.4.0           2020-07         CT#88e         CP-201342         0440         3         F         Corrections of Enhance Coverage Restriction         16.4.0           2020-07         CT#88e         CP-201042         0441         1         B         Timer needed for the SOR-AF to respond         16.4.0           2020-07         CT#88e								
2020-07         CT#88e         CP-201048         0430         1         B         N5GC device Authentication         16.4.0           2020-07         CT#88e         CP-201030         0431         F         DeregistrationData         16.4.0           2020-07         CT#88e         CP-201019         0434         1         A         Shared Data Clarification         16.4.0           2020-07         CT#88e         CP-201048         0436         1         F         Removal of RG-TMBR         16.4.0           2020-07         CT#88e         CP-201056         0437         F         RAT Type Restriction         16.4.0           2020-07         CT#88e         CP-201056         0438         F         implicitUnsubscribe for SMF         16.4.0           2020-07         CT#88e         CP-201034         0439         1         F         Authentication results for multiple registrations         16.4.0           2020-07         CT#88e         CP-201034         0440         3         F         Corrections of Enhance Coverage Restriction         16.4.0           2020-07         CT#88e         CP-201042         0441         1         B         Timer needed for the SOR-AF to respond         16.4.0           2020-07         CT#88e					1		·	
2020-07         CT#88e         CP-201030         0431         F         DeregistrationData         16.4.0           2020-07         CT#88e         CP-201019         0434         1         A         Shared Data Clarification         16.4.0           2020-07         CT#88e         CP-201048         0436         1         F         Removal of RG-TMBR         16.4.0           2020-07         CT#88e         CP-201056         0437         F         RAT Type Restriction         16.4.0           2020-07         CT#88e         CP-201056         0438         F         implicitUnsubscribe for SMF         16.4.0           2020-07         CT#88e         CP-201034         0439         1         F         Authentication results for multiple registrations         16.4.0           2020-07         CT#88e         CP-201342         0440         3         F         Corrections of Enhance Coverage Restriction         16.4.0           2020-07         CT#88e         CP-201042         0441         1         B         Timer needed for the SOR-AF to respond         16.4.0           2020-07         CT#88e         CP-201049         0443         F         Correction on V2X Subscription data         16.4.0           2020-07         CT#88e         CP-2								
2020-07         CT#88e         CP-201019         0434         1         A         Shared Data Clarification         16.4.0           2020-07         CT#88e         CP-201048         0436         1         F         Removal of RG-TMBR         16.4.0           2020-07         CT#88e         CP-201056         0437         F         RAT Type Restriction         16.4.0           2020-07         CT#88e         CP-201056         0438         F         implicitUnsubscribe for SMF         16.4.0           2020-07         CT#88e         CP-201034         0439         1         F         Authentication results for multiple registrations         16.4.0           2020-07         CT#88e         CP-201342         0440         3         F         Corrections of Enhance Coverage Restriction         16.4.0           2020-07         CT#88e         CP-201042         0441         1         B         Timer needed for the SOR-AF to respond         16.4.0           2020-07         CT#88e         CP-201049         0443         F         Correction on V2X Subscription data         16.4.0           2020-07         CT#88e         CP-201032         0444         1         B         Implementing LCS Broadcast Assistance API         16.4.0           2020-07 <td></td> <td></td> <td></td> <td></td> <td><del></del></td> <td></td> <td></td> <td></td>					<del></del>			
2020-07         CT#88e         CP-201048         0436         1         F         Removal of RG-TMBR         16.4.0           2020-07         CT#88e         CP-201056         0437         F         RAT Type Restriction         16.4.0           2020-07         CT#88e         CP-201056         0438         F         implicitUnsubscribe for SMF         16.4.0           2020-07         CT#88e         CP-201034         0439         1         F         Authentication results for multiple registrations         16.4.0           2020-07         CT#88e         CP-201342         0440         3         F         Corrections of Enhance Coverage Restriction         16.4.0           2020-07         CT#88e         CP-201042         0441         1         B         Timer needed for the SOR-AF to respond         16.4.0           2020-07         CT#88e         CP-201049         0443         F         Correction on V2X Subscription data         16.4.0           2020-07         CT#88e         CP-201032         0444         1         B         Implementing LCS Broadcast Assistance API         16.4.0           2020-07         CT#88e         CP-201046         0445         3         B         Monitoring Configuration for event UE reachability         16.4.0 <tr< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr<>								
2020-07         CT#88e         CP-201056         0437         F         RAT Type Restriction         16.4.0           2020-07         CT#88e         CP-201056         0438         F         implicitUnsubscribe for SMF         16.4.0           2020-07         CT#88e         CP-201034         0439         1         F         Authentication results for multiple registrations         16.4.0           2020-07         CT#88e         CP-201342         0440         3         F         Corrections of Enhance Coverage Restriction         16.4.0           2020-07         CT#88e         CP-201042         0441         1         B         Timer needed for the SOR-AF to respond         16.4.0           2020-07         CT#88e         CP-201049         0443         F         Correction on V2X Subscription data         16.4.0           2020-07         CT#88e         CP-201032         0444         1         B         Implementing LCS Broadcast Assistance API         16.4.0           2020-07         CT#88e         CP-201046         0445         3         B         Monitoring Configuration for event UE reachability         16.4.0           2020-07         CT#88e         CP-201034         0446         F         Miscellaneous Corrections         16.4.0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td>Α</td><td></td><td></td></t<>						Α		
2020-07         CT#88e         CP-201056         0437         F         RAT Type Restriction         16.4.0           2020-07         CT#88e         CP-201056         0438         F         implicitUnsubscribe for SMF         16.4.0           2020-07         CT#88e         CP-201034         0439         1         F         Authentication results for multiple registrations         16.4.0           2020-07         CT#88e         CP-201342         0440         3         F         Corrections of Enhance Coverage Restriction         16.4.0           2020-07         CT#88e         CP-201042         0441         1         B         Timer needed for the SOR-AF to respond         16.4.0           2020-07         CT#88e         CP-201049         0443         F         Correction on V2X Subscription data         16.4.0           2020-07         CT#88e         CP-201032         0444         1         B         Implementing LCS Broadcast Assistance API         16.4.0           2020-07         CT#88e         CP-201046         0445         3         B         Monitoring Configuration for event UE reachability         16.4.0           2020-07         CT#88e         CP-201034         0446         F         Miscellaneous Corrections         16.4.0 <t< td=""><td>2020-07</td><td>CT#88e</td><td>CP-201048</td><td>0436</td><td>1</td><td>F</td><td>Removal of RG-TMBR</td><td>16.4.0</td></t<>	2020-07	CT#88e	CP-201048	0436	1	F	Removal of RG-TMBR	16.4.0
2020-07         CT#88e         CP-201056         0438         F         implicitUnsubscribe for SMF         16.4.0           2020-07         CT#88e         CP-201034         0439         1         F         Authentication results for multiple registrations         16.4.0           2020-07         CT#88e         CP-201342         0440         3         F         Corrections of Enhance Coverage Restriction         16.4.0           2020-07         CT#88e         CP-201042         0441         1         B         Timer needed for the SOR-AF to respond         16.4.0           2020-07         CT#88e         CP-201049         0443         F         Correction on V2X Subscription data         16.4.0           2020-07         CT#88e         CP-201032         0444         1         B         Implementing LCS Broadcast Assistance API         16.4.0           2020-07         CT#88e         CP-201046         0445         3         B         Monitoring Configuration for event UE reachability         16.4.0           2020-07         CT#88e         CP-201034         0446         F         Miscellaneous Corrections         16.4.0           2020-07         CT#88e         CP-201034         0447         1         F         Corrections on resouce Supi of SDM service	2020-07	CT#88e	CP-201056	0437		F		16.4.0
2020-07         CT#88e         CP-201034         0439         1         F         Authentication results for multiple registrations         16.4.0           2020-07         CT#88e         CP-201342         0440         3         F         Corrections of Enhance Coverage Restriction         16.4.0           2020-07         CT#88e         CP-201042         0441         1         B         Timer needed for the SOR-AF to respond         16.4.0           2020-07         CT#88e         CP-201049         0443         F         Correction on V2X Subscription data         16.4.0           2020-07         CT#88e         CP-201032         0444         1         B         Implementing LCS Broadcast Assistance API         16.4.0           2020-07         CT#88e         CP-201046         0445         3         B         Monitoring Configuration for event UE reachability         16.4.0           2020-07         CT#88e         CP-201034         0446         F         Miscellaneous Corrections         16.4.0           2020-07         CT#88e         CP-201034         0447         1         F         Corrections on resouce Supi of SDM service         16.4.0           2020-07         CT#88e         CP-201045         0448         F         5G VN Group Data Correction								
2020-07         CT#88e         CP-201342         0440         3         F         Corrections of Enhance Coverage Restriction         16.4.0           2020-07         CT#88e         CP-201042         0441         1         B         Timer needed for the SOR-AF to respond         16.4.0           2020-07         CT#88e         CP-201049         0443         F         Correction on V2X Subscription data         16.4.0           2020-07         CT#88e         CP-201032         0444         1         B         Implementing LCS Broadcast Assistance API         16.4.0           2020-07         CT#88e         CP-201046         0445         3         B         Monitoring Configuration for event UE reachability         16.4.0           2020-07         CT#88e         CP-201034         0446         F         Miscellaneous Corrections         16.4.0           2020-07         CT#88e         CP-201034         0447         1         F         Corrections on resource Supi of SDM service         16.4.0           2020-07         CT#88e         CP-201045         0448         F         5G VN Group Data Correction         16.4.0					4			
2020-07         CT#88e         CP-201042         0441         1         B         Timer needed for the SOR-AF to respond         16.4.0           2020-07         CT#88e         CP-201049         0443         F         Correction on V2X Subscription data         16.4.0           2020-07         CT#88e         CP-201032         0444         1         B         Implementing LCS Broadcast Assistance API         16.4.0           2020-07         CT#88e         CP-201046         0445         3         B         Monitoring Configuration for event UE reachability         16.4.0           2020-07         CT#88e         CP-201034         0446         F         Miscellaneous Corrections         16.4.0           2020-07         CT#88e         CP-201034         0447         1         F         Corrections on resource Supi of SDM service         16.4.0           2020-07         CT#88e         CP-201045         0448         F         5G VN Group Data Correction         16.4.0								
2020-07         CT#88e         CP-201049         0443         F         Correction on V2X Subscription data         16.4.0           2020-07         CT#88e         CP-201032         0444         1         B         Implementing LCS Broadcast Assistance API         16.4.0           2020-07         CT#88e         CP-201046         0445         3         B         Monitoring Configuration for event UE reachability         16.4.0           2020-07         CT#88e         CP-201034         0446         F         Miscellaneous Corrections         16.4.0           2020-07         CT#88e         CP-201034         0447         1         F         Corrections on resource Supi of SDM service         16.4.0           2020-07         CT#88e         CP-201045         0448         F         5G VN Group Data Correction         16.4.0								
2020-07         CT#88e         CP-201049         0443         F         Correction on V2X Subscription data         16.4.0           2020-07         CT#88e         CP-201032         0444         1         B         Implementing LCS Broadcast Assistance API         16.4.0           2020-07         CT#88e         CP-201046         0445         3         B         Monitoring Configuration for event UE reachability         16.4.0           2020-07         CT#88e         CP-201034         0446         F         Miscellaneous Corrections         16.4.0           2020-07         CT#88e         CP-201034         0447         1         F         Corrections on resource Supi of SDM service         16.4.0           2020-07         CT#88e         CP-201045         0448         F         5G VN Group Data Correction         16.4.0	2020-07	CT#88e	CP-201042	0441	1	В	Timer needed for the SOR-AF to respond	16.4.0
2020-07         CT#88e         CP-201032         0444         1         B         Implementing LCS Broadcast Assistance API         16.4.0           2020-07         CT#88e         CP-201046         0445         3         B         Monitoring Configuration for event UE reachability         16.4.0           2020-07         CT#88e         CP-201034         0446         F         Miscellaneous Corrections         16.4.0           2020-07         CT#88e         CP-201034         0447         1         F         Corrections on resource Supi of SDM service         16.4.0           2020-07         CT#88e         CP-201045         0448         F         5G VN Group Data Correction         16.4.0		CT#88e				F		16.4.0
2020-07         CT#88e         CP-201046         0445         3         B         Monitoring Configuration for event UE reachability         16.4.0           2020-07         CT#88e         CP-201034         0446         F         Miscellaneous Corrections         16.4.0           2020-07         CT#88e         CP-201034         0447         1         F         Corrections on resource Supi of SDM service         16.4.0           2020-07         CT#88e         CP-201045         0448         F         5G VN Group Data Correction         16.4.0					1			
2020-07         CT#88e         CP-201034         0446         F         Miscellaneous Corrections         16.4.0           2020-07         CT#88e         CP-201034         0447         1         F         Corrections on resource Supi of SDM service         16.4.0           2020-07         CT#88e         CP-201045         0448         F         5G VN Group Data Correction         16.4.0								
2020-07         CT#88e         CP-201034         0447         1         F         Corrections on resource Supi of SDM service         16.4.0           2020-07         CT#88e         CP-201045         0448         F         5G VN Group Data Correction         16.4.0					3			
2020-07         CT#88e         CP-201034         0447         1         F         Corrections on resouce Supi of SDM service         16.4.0           2020-07         CT#88e         CP-201045         0448         F         5G VN Group Data Correction         16.4.0	2020-07	CT#88e	CP-201034	0446		F	Miscellaneous Corrections	16.4.0
2020-07 CT#88e CP-201045 0448 F 5G VN Group Data Correction 16.4.0	2020-07	CT#88e	CP-201034	0447	1	F		16.4.0
2020-07   C1#00e   CP-201034   0449     F   Cardinality of ProblemDetails   16.4.0								
	2020-07	01#086	OF-201034	0449		Г	Cardinality of ProblemDetails	10.4.0

0000 07	OT#00	00.004004	0.450			In	40.40
2020-07	CT#88e	CP-201034	0450		F	Removal of error	16.4.0
0000.07	OT#00-	OD 004000	0.450			"SERVING_NETWORK_NOT_AUTHORIZED"	40.40
2020-07	CT#88e	CP-201033	0452	1	F	Initial Registration	16.4.0
2020-07	CT#88e	CP-201033	0453	1	В	Support of SMSoIP	16.4.0
2020-07	CT#88e	CP-201045	0454	1	F	Handling of CAG capable UE at legacy AMF	16.4.0
2020-07	CT#88e	CP-201032	0455	1	F	Mobile Originated Data retrieval	16.4.0
2020-07	CT#88e	CP-201073	0459		F	3GPP TS 29.503 API Version and External doc Update	16.4.0
2020-09	CT#89e	CP-202043	0478		Α	Introduction of NOTE for "freeze 5G-TMSI" in case of	16.5.0
						Purge	
2020-09	CT#89e	CP-202043	0480		Α	Correction of creation of subscription by UDM at UDR	16.5.0
2020-09	CT#89e	CP-202110	0460		F	UE Context Retrieval	16.5.0
2020-09	CT#89e	CP-202111	0461		F	Deregistration Reason Clarification	16.5.0
2020-09	CT#89e	CP-202091	0462	1	F	Deregistration Notification	16.5.0
2020-09	CT#89e	CP-202231	0463	3	F	NodeType in HssAuthenticationInfoRequest	16.5.0
2020-09	CT#89e	CP-202106	0465	1	F	DN-AAA secondary authentication	16.5.0
2020-09	CT#89e	CP-202110	0467		F	UDM parameter provision datakey	16.5.0
2020-09	CT#89e	CP-202111	0468		F	Definition of missing error conditions in SMSF registration	16.5.0
						information retrieval	
2020-09	CT#89e	CP-202091	0469	1	F	S-NSSAI in SM Context Retrieval	16.5.0
2020-09	CT#89e	CP-202091	0470	1	F	Clarification on Max Number of Reports	16.5.0
2020-09	CT#89e	CP-202123	0472	1	F	Network Slices in AMF registrations	16.5.0
2020-09	CT#89e	CP-202105	0474	<u> </u>	F	Invoke NEF indication	16.5.0
2020-09	CT#89e	CP-202105	0475	1	F	Maximum response time/latency time	16.5.0
2020-09	CT#89e	CP-202103	0476	1	F	Dedicated SMF selection	16.5.0
2020-09	CT#89e	CP-202091	0476		F		16.5.0
				1		Corrections on reference of common data structures	
2020-09	CT#89e	CP-202115	0483	1	F	Corrections on 5G SoR	16.5.0
2020-09	CT#89e	CP-202110	0484	1	F	Storage of YAML files in 3GPP Forge	16.5.0
2020-09	CT#89e	CP-202110	0485	1	F	Corrections on UPU	16.5.0
2020-09	CT#89e	CP-202110	0486		F	Miscellaneous corrections	16.5.0
2020-09	CT#89e	CP-202096	0489		F	API version and External doc update	16.5.0
2020-12	CT#90e	CP-203220	0492	3	F	Initial Registration procedure on a CAG Cell	16.6.0
2020-12	CT#90e	CP-203050	0494	1	F	Essential corrections	16.6.0
2020-12	CT#90e	CP-203044	0496	1	F	Config DNN for PDU session status event	16.6.0
2020-12	CT#90e	CP-203049	0498	1	F	Subscription applies also to EPC in EE service	16.6.0
2020-12	CT#90e	CP-203048	0501		F	Remove Network Slices in AMF registrations	16.6.0
2020-12	CT#90e	CP-203040	0504	1	F	AMF Registration Retrieval by NSSAAF	16.6.0
2020-12	CT#90e	CP-203027	0506		F	Reference for NSSAI Inclusion Allowed	16.6.0
2020-12	CT#90e	CP-203054	0511		F	HTTP 3xx redirection	16.6.0
2020-12	CT#90e	CP-203048	0513		F	Snssai query parameter	16.6.0
2020-12	CT#90e	CP-203016	0515	2	F	UE Reachability for IP	16.6.0
2020-12	CT#90e	CP-203039	0521		F	Service Area Restriction in wireline	16.6.0
2020-12	CT#90e	CP-203045	0524		F	Correction on event exposure	16.6.0
2020-12	CT#90e	CP-203048	0527		F	Reference ID	16.6.0
2020-12	CT#90e	CP-203042	0529	1	F	Parameter Provisioning Get operation for 5G VN Group	16.6.0
2020-12	CT#90e	CP-203042 CP-203048	0529	- '	F	Removal of SMF Individual Registration PATCH method	16.6.0
2020-12	CT#90e CT#90e	CP-203048 CP-203049	0533		F		16.6.0
2020-12	CT#90e CT#90e					HSS Authentication HTTP 403 Error	
		CP-203048	0536		F	Essential corrections	16.6.0
2020-12	CT#90e	CP-203049	0537		F	Define UE Context In AMF Data Retrieval service operation	16.6.0
2020-12	CT#90e	CP-203041	0539	1	F	Essential Correction on AF ID	16.6.0
2020-12	CT#90e	CP-203041	0541	1	F	Event Configuration Synchronization between 4G&5G	16.6.0
2020-12	CT#90e	CP-203041	0543	2	F	Introduction of MTC Provider authorization	16.6.0
2020-12	CT#90e	CP-203041	0545	2	F	Network Configuration Parameter Aggregation	16.6.0
2020-12	CT#90e	CP-203036	0557		F	29.503 Rel-16 API version and External doc update	16.6.0
2021-03	CT#91e	CP-210043	0572		F	DIPacketCount	16.7.0
2021-03	CT#91e	CP-210043	0575		F	Deregistration Notification to Old SMF	16.7.0
2021-03	CT#91e	CP-210048	0578		F	AF ID for ECR Control	16.7.0
2021-03	CT#91e	CP-210049	0582		F	Slice Information for PDN Connection Setup	16.7.0
	CT#91e	CP-210043	0584		F	Corrections on reference of data type	16.7.0
2021-03	CT#91e	CP-210048	0586	1	F	Corrections on 403 forbidden with the proper Application	16.7.0
2021-03 2021-03	01#316						1
	01#316					Errors	
	CT#91e	CP-210061	0589	1	F	Errors Wildcard DNN in subscriptionDataSubscription	16.7.0
2021-03		CP-210061 CP-210050	0589 0591	1	F F	Wildcard DNN in subscriptionDataSubscription  IPTV access control information	16.7.0 16.7.0

2021-03	CT#91e	CP-210041	0596		Corrected service consumer for LCS Broadcast Assistance data	16.7.0
2021-03	CT#91e	CP-210043	0598		Monitored resource URI	16.7.0
2021-03	CT#91	CP-210054	0600	F	29.503 Rel-16 API version and External doc update	16.7.0

### History

	Document history								
V16.4.0	July 2020	Publication							
V16.5.0	November 2020	Publication							
V16.6.0	January 2021	Publication							
V16.7.0	April 2021	Publication							