

3GPP-(Technical Speciation
Group Core Network and
Terminals; 5G System; Usage of
the Unified Data Repository
service for Policy Data,
Application Data and Structured
Data for Exposure; Stage 3)



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Technical Specification

**3rd Generation Partnership Project;
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5G System; Usage of the Unified Data Repository service for
Policy Data, Application Data and Structured Data for
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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:

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- x the first digit:
 - 1 presented to TSG for information;
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- 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.

1 Scope

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

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

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- 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 29.504: "5G System; Unified Data Repository Services; Stage 3".
- [7] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces Stage 3".
- [8] 3GPP TS 29.551: "5G System; Packet Flow Description Management Service; Stage 3".
- [9] 3GPP TS 29.122: "T8 reference point for Northbound APIs".
- [10] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

3 Definitions and abbreviations

3.1 Definitions

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

3.2 Abbreviations

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

PCF Policy Control Function

NEF Network Exposure Function

UDR Unified Data Repository

4 Overview

5 Usage of Nudr_DataRepository Service API for Policy Data

5.1 Introduction

5.2 Resources

5.2.1 Overview

5.2.2 Resource Structure

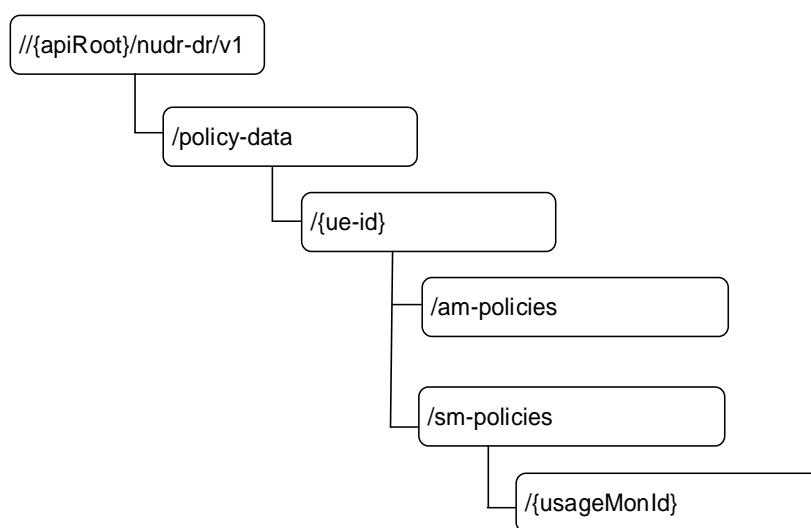


Figure 5.2.2-1: Resource URI structure of the Nudr_DataRepository API for policy data

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

Table 5.2.2-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
AccessAndMobilityPolicies	{apiRoot}/nudr-dr/v1/{ue-id}/am-policies	GET	Retrieves the access and mobility policy data for a subscriber.
		PUT(FFS)	Modifies am-policies.
SessionManagementPolicies	{apiRoot}/nudr-dr/v1/{ue-id}/sm-policies	GET	Retrieves the session management policy data for a subscriber.

UsageMonitoringInformation	{apiRoot}/nudr-dr/v1/{ue-id}/sm-policies/{usageMonId}	GET	Retrieve a usage monitoring resource.
	{apiRoot}/nudr-dr/v1/{ue-id}/sm-policies/{usageMonId}	PUT	Modify or create a usage monitoring resource
	{apiRoot}/nudr-dr/v1/{ue-id}/sm-policies/{usageMonId}	DELETE	Delete a usage monitoring resource.

5.2.3 Resource: AccessAndMobilityPolicies

5.2.3.1 Description

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

5.2.3.2 Resource definition

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

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

Table 5.2.3.2-1: Resource URI variables for this resource

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

5.2.3.3 Resource Standard Methods

5.2.3.3.1 GET

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

Table 5.2.3.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 5.2.3.3.1-2 and the response data structures and response codes specified in table 5.2.3.3.1-3.

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

Data type	P	Cardinality	Description
n/a			

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

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

5.2.4 Resource: SessionManagementPolicies

5.2.4.1 Description

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

5.2.4.2 Resource definition

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

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

Table 5.2.4.2-1: Resource URI variables for this resource

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

5.2.4.3 Resource Standard Methods

5.2.4.3.1 GET

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

Table 5.2.4.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 5.2.4.3.1-2 and the response data structures and response codes specified in table 5.2.4.3.1-3.

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

Data type	P	Cardinality	Description
n/a			

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

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

5.2.5 Resource: UsageMonitoringInformation

5.2.5.1 Description

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

5.2.5.2 Resource definition

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

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

Table 5.2.5.2-1: Resource URI variables for this resource

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

5.2.5.3 Resource Standard Methods

5.2.5.3.1 PUT

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

Table 5.2.5.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 5.2.5.3.1-2 and the response data structures and response codes specified in table 5.2.5.3.1-3.

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

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

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

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

5.3 Notifications

5.4 Data Model

5.4.1 General

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

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

Table 5.4.1-1: Nudr specific Data Types

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

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

Table 5.4.1-2: Nudr re-used Data Types

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

5.4.2 Structured data types

5.4.2.1 Introduction

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

Allowed structures are: array, object.

5.4.2.2 Type

Table 5.4.2.2-1: Nudr_DataRepository Policy Data data types

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

NOTE 1: The PDU Session policy control subscription information can contain multiple usage monitoring instances, with key monkey.

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

Attribute name	Data type	P	Cardinality	Description	Applicability
monKey (NOTE 1)	MonKey (FFS)	M	1..N	Identifier to a usage monitoring control instance that includes one or more PCC rules	
volUsage (Note 1)	Volume	C	0..N	Accumulated traffic volume for a usage monitoring instance.	
timeUsage (Note 1)	DateTime	C	0..N	Accumulated resource time usage for a usage monitoring instance	

NOTE 1: The Accumulated usage information can contain multiple usage monitoring instances, with key monKey.

5.5 Error handling

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

Table 5.5-1: Common Response Body Data Structures

Data type	P	Cardinality	Response codes	Description

NOTE: Error response codes defined in 3GPP TS 29.504 [6] are supported.

5.6 Feature negotiation

6 Usage of Nudr_DataRepository Service API for Application Data

6.1 Introduction

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

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

with the following components:

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

6.2 Resources

6.2.1 Overview

6.2.2 Resource Structure

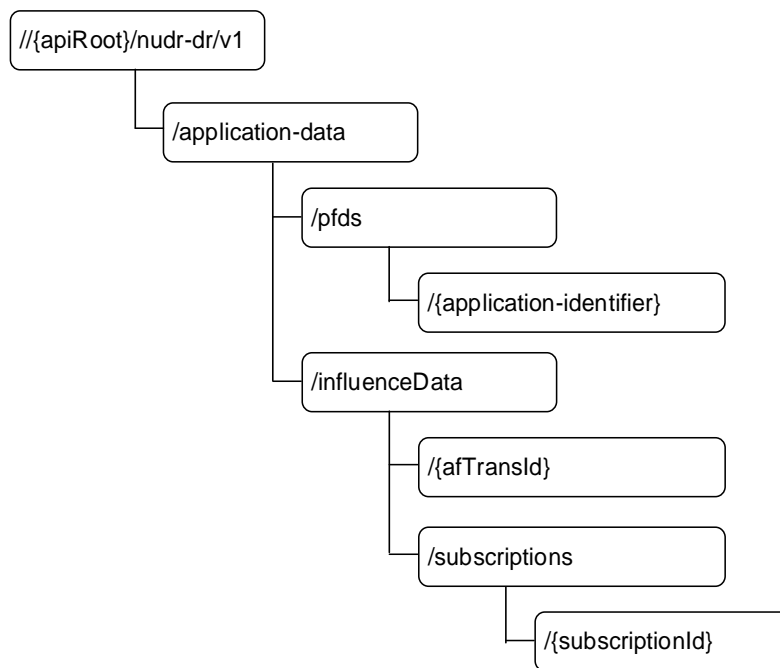


Figure 6.2.2-1: Resource URI structure of the Nudr_DataRepository API for application data

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

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

Table 6.2.2-1: Resources and methods overview

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

6.2.3 Resource: PFD Data

6.2.3.1 Description

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

6.2.3.2 Resource definition

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

Table 6.2.3.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See subclause 6.1

6.2.3.3 Resource Standard Methods

6.2.3.3.1 GET

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

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

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

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

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

Data type	P	Cardinality	Description
n/a			

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

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

6.2.4 Resource: Individual PFD Data

6.2.4.1 Description

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

6.2.4.2 Resource definition

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

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

Table 6.2.4.2-1: Resource URI variables for this resource

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

6.2.4.3 Resource Standard Methods

6.2.4.3.1 GET

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

Table 6.2.4.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.4.3.1-2 and the response data structures and response codes specified in table 6.2.4.3.1-3.

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

Data type	P	Cardinality	Description
n/a			

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

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

6.2.4.3.2 DELETE

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

Table 6.2.4.3.2-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.4.3.2-2 and the response data structures and response codes specified in table 6.2.4.3.2-3.

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

Data type	P	Cardinality	Description
n/a			

Table 6.2.4.3.2-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No content	Successful case. The Individual PFD Data resource related to the application-identifier was deleted.
n/a			404 Not Found	If the Individual PFD Data resource does not exist, the UDR shall responds with "404 Not Found".

6.2.4.3.3 PUT

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

Table 6.2.4.3.3-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.4.3.3-2 and the response data structures and response codes specified in table 6.2.4.3.3-3.

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

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

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

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

6.2.5 Resource: Influence Data

6.2.5.1 Description

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

6.2.5.2 Resource definition

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

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

Table 6.2.5.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See subclause 6.1

6.2.5.3 Resource Standard Methods

6.2.5.3.1 GET

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

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

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

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

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

Data type	P	Cardinality	Description
n/a			

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

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

6.2.6 Resource: Individual Influence Data

6.2.6.1 Description

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

6.2.6.2 Resource definition

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

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

Table 6.2.6.2-1: Resource URI variables for this resource

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

6.2.6.3 Resource Standard Methods

6.2.6.3.1 PUT

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

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

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

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

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

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

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

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

6.2.6.3.2 PATCH

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

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

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

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

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

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

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

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

6.2.6.3.3 DELETE

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

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

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

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

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

Data type	P	Cardinality	Description
n/a			

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

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

6.2.7 Resource: Influence Data Subscription

6.2.7.1 Description

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

6.2.7.2 Resource definition

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

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

Table 6.2.7.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See subclause 6.1

6.2.7.3 Resource Standard Methods

6.2.7.3.1 POST

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

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

Name	Data type	P	Cardinality	Description
n/a				

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

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

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

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

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

6.2.7.3.2 GET

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

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

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

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

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

Data type	P	Cardinality	Description
n/a			

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

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

6.2.8 Resource: Individual Influence Data Subscription

6.2.8.1 Description

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

6.2.8.2 Resource definition

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

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

Table 6.2.8.2-1: Resource URI variables for this resource

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

6.2.8.3 Resource Standard Methods

6.2.8.3.1 GET

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

Table 6.2.8.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.8.3.1-2 and the response data structures and response codes specified in table 6.2.8.3.1-3.

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

Data type	P	Cardinality	Description
n/a			

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

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

6.2.8.3.2 PUT

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

Table 6.2.8.3.2-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.8.3.2-2 and the response data structures and response codes specified in table 6.2.8.3.2-3.

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

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

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

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

6.2.8.3.3 DELETE

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

Table 6.2.8.3.3-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.8.3.3-2 and the response data structures and response codes specified in table 6.2.8.3.3-3.

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

Data type	P	Cardinality	Description
n/a			

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

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

6.3 Notifications

6.3.1 General

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

Table 6.3.1-1: Notifications

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

6.3.2 PFDs Update Notification

6.3.2.1 Description

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

6.3.2.2 Operation Definition

URI: {pfdUpdateNotifyUri}

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

Table 6.3.2.2-1: URI variables

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

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

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

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

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

6.3.3 Influence Data Update Notification

6.3.3.1 Description

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

6.3.3.2 Operation Definition

URI: {**InfluenceDataUpdateNotifyUri**}

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

Table 6.3.3.2-1: URI variables

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

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

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

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

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

6.4 Data Model

6.4.1 General

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

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

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

Data type	Section defined	Description	Applicability

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

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

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

6.4.2 Structured data types

6.4.2.1 Introduction

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

Allowed structures are: array, object.

6.4.2.2 Type TrafficInfluData

Table 6.4.2.2-1: Definition of type TrafficInfluData

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

6.4.2.3 Type TrafficInfluDataPatch

Table 6.4.2.3-1: Definition of type TrafficInfluDataPatch

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

6.4.2.4 Type TrafficInfluSub

Table 6.4.2.4-1: Definition of type TrafficInfluSub

Attribute name	Data type	P	Cardinality	Description	Applicability
dnn	array(Dnn)	C	0..N	Identifies a DNN. (NOTE)	
snssai	array(Snssai)	C	0..N	Identifies a slice. (NOTE)	
externalGroupld	array(ExternalGroupld)	C	0..N	Identifies a group of users. (NOTE)	
externalld	array(Externalld)	C	0..N	Identifies a user. (NOTE)	
gpsi	array(Gpsi)	C	0..N	Identifies the user. (NOTE)	
NOTE: One of afTansld, snssai and DNN, individual UE identifier (i.e. "gpsi", "ipv4Addr", "ipv6Addr" or "externalld"), External Group Identifier (i.e. "exterGroupld") or any UE indication "anyUelnd" shall be included.					

6.4.2.5 Type TrafficInfluSubPatch

Table 6.4.2.5-1: Definition of type TrafficInfluSubPatch

Attribute name	Data type	P	Cardinality	Description	Applicability
dnn	array(Dnn)	O	0..N	Identifies the DNNs. (NOTE)	
snssai	array(Snssai)	O	0..N	Identifies the slices. (NOTE)	
externalGroupld	array(ExternalGroupld)	O	0..N	Identifies a group of users. (NOTE)	
externalld	array(Externalld)	O	0..N	Identifies the users. (NOTE)	
gpsi	array(Gpsi)	O	0..N	Identifies the users. (NOTE)	

6.5 Error handling

6.5.1 General

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

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

6.5.2 Protocol Errors

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

6.5.3 Application Errors

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

Table 6.5.3-1: Application errors

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

6.6 Feature negotiation

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

Table 6.6-1: Supported Features

Feature number	Feature Name	Description

7 Usage of Nudr_DataRepository Service API for Structured Data for Exposure

7.1 Introduction

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

7.2 Resources

7.2.1 Overview

7.2.2 Resource Structure

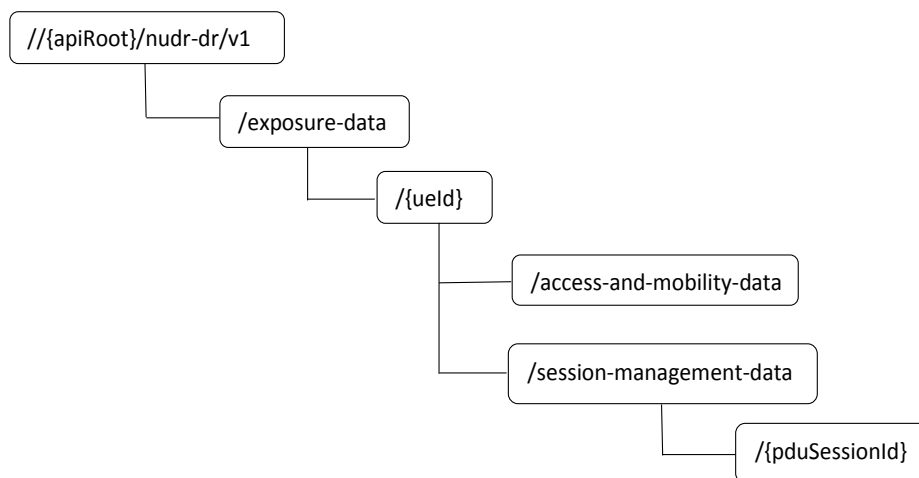


Figure 7.2.2-1: Resource URI structure of the Nudr_DataRepository API for exposure data

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

Table 7.2.2-1: Resources and methods overview

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

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

7.2.3 Resource: AccessAndMobilityData

7.2.3.1 Description

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

7.2.3.2 Resource definition

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

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

Table 7.2.3.2-1: Resource URI variables for this resource

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

7.2.3.3 Resource Standard Methods

7.2.3.3.1 PUT

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

Table 7.2.3.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 7.2.3.3.1-2 and the response data structures and response codes specified in table 7.2.3.3.1-3.

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

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

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

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

7.2.3.3.2 GET

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

Table 7.2.3.3.2-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 7.2.3.3.2-2 and the response data structures and response codes specified in table 7.2.3.3.2-3.

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

Data type	P	Cardinality	Description
n/a			

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

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

7.2.3.3.3 DELETE

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

Table 7.2.3.3.3-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 7.2.3.3.3-2 and the response data structures and response codes specified in table 7.2.3.3.3-3.

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

Data type	P	Cardinality	Description
n/a			

Table 7.2.3.3-3: Data structures supported by the DELETE Response Body on this resource

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

7.2.4 Resource: SessionManagementData

7.2.4.1 Description

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

7.2.4.2 Resource Definition

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

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

Table 7.2.4.2-1: Resource URI variables for this resource

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

7.2.5 Resource: PduSessionManagementData

7.2.5.1 Description

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

7.2.5.2 Resource definition

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

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

Table 7.2.5.2-1: Resource URI variables for this resource

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

7.2.5.3 Resource Standard Methods

7.2.5.3.1 PUT

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

Table 7.2.5.3.1-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 7.2.5.3.1-2 and the response data structures and response codes specified in table 7.2.5.3.1-3.

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

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

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

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

7.2.5.3.2 GET

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

Table 7.2.5.3.2-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 7.2.5.3.2-2 and the response data structures and response codes specified in table 7.2.5.3.2-3.

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

Data type	P	Cardinality	Description
n/a			

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

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

7.2.5.3.3 DELETE

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

Table 7.2.5.3.3-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 7.2.5.3.3-2 and the response data structures and response codes specified in table 7.2.5.3.3-3.

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

Data type	P	Cardinality	Description
n/a			

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

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

7.3 Data Model

7.3.1 General

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

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

Table 7.3.1-1: Nudr specific Data Types

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

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

Table 7.3.1-2: Nudr re-used Data Types

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

7.3.2 Structured data types

7.3.2.1 Introduction

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

Allowed structures are: array, object.

7.3.2.2 Type AccessAndMobilityData

Table 7.3.2.2-1: Definition of type AccessAndMobilityData

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

7.3.2.3 Type PduSessionManagementData

Table 7.3.2.3-1: Definition of type PduSessionManagementData

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

7.3.3 Simple data types and enumerations

7.3.3.1 Introduction

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

7.3.3.2 Simple data types

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

Table 7.3.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability
Dnai	string		

7.3.3.2.1 Enumeration: PduSessionStatus

Table 7.3.3.2.1-1: Enumeration PduSessionStatus

Enumeration value	Description	Applicability
"ACTIVE"		
"RELEASED"		

7.4 Error handling

7.5 Feature negotiation

Annex A (normative): OpenAPI specification

A.1 General

A.2 Nudr_DataRepository for Policy Data

A.3 Nudr_DataRepository for Application Data

A.4 Nudr_DataRepository for Exposure Data

```

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

```

```

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

```



```

delete:
  summary: Deletes the session management data for a UE and for an individual PDU session
  operationId: DeleteSessionManagementData
  tags:
    - PduSessionManagementData
  parameters:
    - name: ueId
      in: path
      description: UE id
      required: true
      schema:
        $ref: '#/components/schemas/VarUeId'
    - name: pduSessionId
      in: path
      description: PDU session id
      required: true
      schema:
        type: integer
  responses:
    '204':
      description: Upon success, an empty response body shall be returned
components:
  schemas:
    AccessAndMobilityData:
      type: object
      properties:
        ueLocation:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/UserLocation'
        ueTimeZone:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/TimeZone'
        ueAccessType:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/AccessType'
        ueRegistrationState:
          $ref: 'TS29518_Namf_EventExposure.yaml#/components/schemas/RmState'
        ueConnectivityState:
          $ref: 'TS29518_Namf_EventExposure.yaml#/components/schemas/CmState'
        ueReachabilityStatus:
          $ref: 'TS29518_Namf_EventExposure.yaml#/components/schemas/UeReachability'
        ueSmsOverNasStatus:
          $ref: 'TS29518_Namf_EventExposure.yaml#/components/schemas/SmsSupport'
        ueRoamingStatus:
          type: boolean
          description: True The serving PLMN of the UE is different from the HPLMN of the UE; False
            The serving PLMN of the UE is the HPLMN of the UE.
        ueCurrentPlmn:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/PlmnId'
        dnn:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
        macAddr:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/MacAddr48'
        ratType:
          $ref: 'TS29517_CommonData.yaml#/components/schemas/RatType'
    PduSessionManagementData:
      type: object
      properties:
        pduSessionStatus:
          $ref: '#/components/schemas/PduSessionStatus'
        dnai:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnai'
        n6TrafficRoutingInfo:
          $ref: '#/components/schemas/FFS'
        ueIpv4Addr:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv4Addr'
        ueIpv6Prefix:
          type: array
          items:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/Ipv6Prefix'
          minItems: 0
          description: UE IPv6 prefix.
    Dnai:
      type: string
    PduSessionStatus:
      anyOf:
        - type: string
          enum:
            - "ACTIVE"
            - "RELEASED"
        - type: string

```

```
description: >
  This string provides forward-compatibility with future
  extensions to the enumeration but is not used to encode
  content defined in the present version of this API.
description: >
  Possible values are
  - "ACTIVE"
  - "RELEASED"
VarUeId:
  type: string
  pattern: '(imsi-[0-9]{5,15}|nai-.*|msisdn-[0-9]{5,15}|extid-.*|.+)'
```

Annex B (informative): Change history

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