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Modal verbs terminology

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Contents

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:

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  - 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 something

shall 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 possible

cannot 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:

is (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 set of APIs and associated resource structures and data models pertaining to the collection and reporting of UE-related data (synonymously “UE data”) by the Data Collection Application Function (AF) in the 5G System for subsequent event exposure services offered to network consumer entities, as defined in 3GPP TS 23.501 [2], TS 23.502 [3], TS 23.288 [4], TS 29.517 [5], TS 29.510 [6] and TS 26.531 [7] .

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 (5GS)".

[3] 3GPP TS 23.502: "Procedures for the 5G System (5GS)".

[4] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

[5] 3GPP TS 29.517: "5G System; Application Function Event Exposure Service; Stage 3".

[6] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[7] 3GPP TS 26.531: "Data Collection and Reporting; General Description and Architecture".

[8] IETF RFC 6750: "The OAuth 2.0 Authorization Framework: Bearer Token Usage".

[9] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[10] "CORS (Cross-Origin Resource Sharing)" protocol as defined in the ‘Fetch’ standard of WHATWG: https://fetch.spec.whatwg.org/#cors-protocol.

[11] 3GPP TS 29.502: "5G System; Session Management Services; Stage 3".

[12] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[13] 3GPP TS 26.512: “5G Media Streaming (5GMS); Protocols”.

[14] 3GPP TS 29.122: "T8 reference point for Northbound APIs".

[15] 3GPP TS 29.572: "5G System; Location Management Services; Stage 3".

[16] OpenAPI: "OpenAPI 3.0.0 Specification", https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md.

[17] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[18] IETF RFC 9113: "HTTP/2", June 2022.

[19] IETF RFC 9112: "HTTP/1.1", June 2022.

[20] IETF RFC 9110: "HTTP Semantics", June 2022.

[21] Void.

[22] Void.

[23] IETF RFC 9111: "HTTP Caching", June 2022.

[24] Void.

[25] ISO 8601-1:2019: "Date and time – Representations for information interchange – Part 1: Basic rules".

[26] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

[27] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

[28] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format", December 2017.

3 Definitions of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in 3GPP TR 21.905 [1], TS 23.501 [2], TS 23.502 [3], TS 23.288 [4], TS 29.517 [5], TS 29.510 [6], TS 26.531 [7] 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].

example: text used to clarify abstract rules by applying them literally.

3.2 Symbols

For the purposes of the present document, the following symbols apply:

Void.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1], TS 23.501 [2], TS 23.502 [3], TS 23.288 [4], TS 29.517 [5], TS 29.510 [6], TS 26.531 [7] 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].

AF	Application Function
AS	Application Server
ASP	Application Service Provider
DC-AF	Data Collection AF
DC-Client	Data Collection Client
NEF	Network Exposure Function
NRF	Network Repository Function
NWDAF	Network Data Analytics Function

4 Procedures for Data Collection and Reporting

4.1 General

This clause specifies the stage 3 procedures for data collection and reporting. In summary:

1. The Data Collection AF registers itself with the NRF using the procedure specified in clause 4.2.2.

2. An Application Service Provider creates via reference point R1 a number of *Data Reporting Configurations* (see clause 4.2.3.3) in the Data Collection AF under the umbrella of a *Provisioning Session* (see clause 4.2.3.2).

3. An event consumer subscribes to receive event notifications from the Data Collection AF at reference point R5 or R6 using the subscription procedure specified in clause 4.2.2 of TS 29.517 [5].

4. A data reporting client obtains its configuration from the Data Collection AF at reference point R2, R3 or R4 by creating a *Data Reporting Session* (see clauses 4.2.4.2, 4.2.5.2 and 4.3.2.2).

5. A data reporting client submits *Data Reports* to the Data Collection AF at reference point R2, R3 or R4 (see clauses 4.2.6, 4.2.7 and 4.3.3).

6. Based on received Data Reports, the Data Collection AF derives and exposes corresponding *Events* to relevant subscribers at reference points R5 and/or R6 using the event notification procedure specified in clause 4.2.4 of TS 29.517 [5]. The UE data exposed may be restricted by *Data Access Profiles* associated with Data Reporting Configurations provisioned in procedure 2 above.

So that the Data Collection AF can realise the data exposure restrictions provisioned in the Data Access Profiles associated with Data Reporting Configurations, the Data Collection AF shall assign a unique *reporting context identifier* (*contextId*) to each Data Reporting Configuration created using procedure 2 above. The reporting context identifier is an opaque identifier that can safely be exposed to the UE Application via reference point R7 or R8.

- Every data sampling rule, data reporting condition and data reporting rule associated with the Data Reporting Configuration shall be decorated with the reporting context identifier assigned to that Data Reporting Configuration. This property shall be included when these data types are exposed to the Application Service Provider at reference point R1 for subsequent use in indirect data reporting at reference point R8.

- Every data sampling rule, data reporting condition and data reporting rule included in a Data Reporting Session at reference points R2, R3 or R4 shall cite the reporting context identifier(s) of the Data Reporting Configuration(s) from which they are derived.

- Every Data Report submitted by a data reporting client at reference point R5 or R6 shall cite the reporting context identifier(s) of the data sampling rule that caused the UE data present in that Data Report to be sampled.

4.2 Network-side procedures

4.2.1 General

This clause specifies the procedures used between network-side entities for UE data collection and reporting, along with related functionality pertaining to the provisioning, management, and delivery of such data between the Data Collection AF and consumer entities.

4.2.2 Data Collection AF registration with NRF

This clause specifies the use of the *Nnrf_NFManagement* service API as defined in TS 29.510 [7] and invoked by a Data Collection AF instance to register its profile with the NRF in order to enable the discovery of the Data Collection AF by consumer entities.

4.2.3 Data collection and reporting provisioning

4.2.3.1 General

An Application Service Provider, via its Provisioing AF, may use the procedures in this clause to supply data collection and reporting provisioning information, as defined in clause 4.2 of TS 26.531 [7], to the Data Collection AF via reference point R1 in the form of Data Reporting Configuration resources. A given Data Reporting Configuration comprises instructions and other information to be followed/used by data collection clients in their collection, processing and reporting to the Data Collection AF of UE data for the associated application service. In addition, a Data Reporting Configuration instance may contain data exposure restrictions for use by the Data Collection AF in controlling access by consumers to event data pertaining to the UE data that it has collected.

The provisioning process begins with the Provisioning AF using the procedures defined in clause 4.2.3.2 to create a Provisioning Session resource as an umbrella for subsequent Data Reporting Configuration resources.

The process then proceeds with the Provisioning AF using the procedures defined in clause 4.2.3.3 to provide the Data Collection AF with one or more Data Reporting Configuration resources. Each set of provisioning information pertains to one application, identified by its External Application Identifier, and one type of exposed event, uniquely identified in the 5G System by its Event ID, as defined in clause 4.15.1 of TS 23.502 [3].

4.2.3.2 Provisioning Session procedures

4.2.3.2.1 General

Prior to provisioning of data collection and reporting, the Provisioning AF shall create a new Provisioning Session. The following CRUD operations are used to manage Provisioning Session resources. Additional details are provided under clause 6.

4.2.3.2.2 Create Provisioning Session

This procedure shall be used by the Provisioning AF to create a new Provisioning Session. The HTTP `POST` method shall be used for this purpose.

Upon successful creation, the Data Collection AF shall respond with a *201 (Created)* response message that includes the resource identifier of the newly created Provisioning Session in the body of the reply, and along with the URL of the resource, including its resource identifier, shall be returned as part of the HTTP `Location` header field.

4.2.3.2.3 Retrieve Provisioning Session properties

This procedure is used by the Provisioning AF to obtain the properties of an existing Provisioning Session from the Data Collection AF. The HTTP `GET` method shall be used for this purpose.

4.2.3.2.4 Update Provisioning Session properties

The Update operation is not allowed on Provisioning Session resources.

4.2.3.2.5 Destroy Provisioning Session

This procedure is used by the Provisioning AF to destroy a Provisioning Session. The Data Collection AF shall use the HTTP `DELETE` method for this purpose.

As a side-effect of destroying a Provisioning Session, the Data Collection AF shall release any associated resources, purge any cached data, and delete all UE data reporting configurations associated with this Provisioning Session.

4.2.3.3 Data Reporting Configuration procedures

4.2.3.3.1 General

Upon the successful creation of a Provisioning Session, the Provisioning AF shall use the procedures defined in this clause to configure UE data collection and reporting functionality specific to an application in the Data Collection AF. This clause defines the basic procedures. Additional details are provided under clause 6.3.

4.2.3.3.2 Data Reporting Configuration entity

A given instance of a Data Reporting Configuration resource is identified by the *dataReportingConfigurationId* property of the *DataReportingConfiguration* resource, and applies to one type of data collection client. The properties of this resource, as defined in the following clauses, pertain to UE data collection and reporting by different data collection clients to the Data Collection AF, and control of access by different consumer entities to event data exposed by the Data Collection AF.

The type of a Data Reporting Configuration resource is identified by the *dataCollectionClientType* property of the *DataReportingConfiguration* resource as specified in clause 6.3.2.2.

NOTE 1: The *dataCollectionClientType* property corresponds to the *Data collection client type* parameter in table 4.6.2-1 of TS 26.531 [7].

The Data Reporting Configuration resource shall include one or more sets of instructions for data collection clients on the collection and reporting of UE data to the Data Collection AF, and may contain one or more sets of data exposure restrictions, expressed as Data Access Profiles (see clause 6.3.2.3), each one determining the level of access by event consumer entities to the event-related UE data reported to the Data Collection AF. A Data Access Profile defines the granularity of access to a particular subset of collected event data parameters for the Event ID of concern. This granularity is expressed as a set of data aggregation functions along the time, user, and location dimensions. The subset of parameters to be exposed is identified using a controlled vocabulary specific to the Event ID. An authorization procedure is in place to determine which Data Access Profile is granted to a particular event consumer entity.

NOTE 2: The process of matching event consumers to Data Access Profiles is implementation-specific and therefore beyond the scope of the present document.

4.2.3.3.3 Create Data Reporting Configuration

This procedure is used by the Provisioning AF to create a Data Reporting Configuration resource within the scope of a particular Provisioning Session. The HTTP `POST` method shall be used for this purpose and the request message body may include a *DataReportingConfiguration* resource, as specified under clause 6.3.2.2.

Upon success, the Data Collection AF shall respond with a *201 (Created)* response message and the resource URL for the newly-created Data Reporting Configuration resource shall be returned in the `Location` header field.

If the procedure is unsuccessful, the Data Collection AF shall provide an error response status code as defined in clause 5.3.3.

This procedure may be performed multiple times to provision different Data Reporting Configurations in the scope of a particular Provisioning Session.

4.2.3.3.4 Retrieve Data Reporting Configuration

This procedure is used by the Provisioning AF to obtain the properties of an existing Data Reporting Configuration resource from the Data Collection AF. The HTTP `GET` method shall be used for this purpose.

If successful, the Data Collection AF shall respond with a *200 (OK)* and the requested *DataReportingConfiguration* resource shall be returned in the body of the HTTP response message.

If the procedure is unsuccessful, the Data Collection AF shall provide an error response status code as defined in clause 5.3.3.

4.2.3.3.5 Update Data Reporting Configuration

The update operation is invoked by the Provisioning AF to initially upload the representation of a Data Reporting Configuration resource created using the procedure in clause 4.2.3.3.3 or, in the case of an existing Data Reporting Configuration resource, to entirely replace or modify certain properties of that resource. All available properties may be updated. The HTTP `PATCH` or HTTP `PUT` methods shall be used for the update operation.

If the procedure is successful, the Data Collection AF shall respond with a *200 (OK)* reflecting the successful update operation.

If the procedure is unsuccessful, the Data Collection AF shall provide a response code as defined in clause 5.3.3.

4.2.3.3.6 Destroy Data Reporting Configuration

This operation is used by the Provisioning AF to destroy a Data Reporting Configuration resource and to terminate the related UE data reporting procedure. The HTTP `DELETE` method shall be used for this purpose.

As a result, the Data Collection AF should release any associated resources, deliver any pending data to subscribed recipients, as appropriate to the Event ID in question, and delete any corresponding configurations.

If the procedure is successful, the Data Collection AF shall respond with a *200 (OK)* response message.

If the procedure is unsuccessful, the Data Collection AF shall provide an error response status code as defined in clause 5.3.3.

4.2.4 Configuration of Indirect Data Collection Client

4.2.4.1 General

Indirect reporting operation involves first a UE Application instance sending domain-specific UE data to an Application Service Provider (ASP) server instance across reference point R8. That UE data is passed from to an Indirect Data Reporting Client function operated by the Application Service Provider to be subsequently sent as data reports, possibly in processed form, to a Data Collection AF instance. Operation of the latter procedure is conditioned upon the Indirect Data Collection Client having acquired its data collection and reporting configuration from the Data Collection AF by means of the *Ndcaf_DataReporting* service (either directly across the reference point R3 or via an equivalent service exposed by the NEF, depending on whether the Indirect Data Collection Client and the Data Collection AF reside in the same or separate trust domains).

The Indirect Data Collection Client shall obtain its configuration by invoking the *Ndcaf_DataReporting_CreateSession* service operation, as described under clause 7.2,2,3.1.

The configuration information is contained in a generic data collection and reporting configuration envelope that shall include at minimum the baseline configuration parameters defined in clause 4.6.3 of TS 26.531 [7]. In particular, the configuration shall specify the domain-specific parameters associated with the specified Event ID(s) to be reported to the Data Collection AF.

4.2.4.2 Indirect Data Collection Client retrieves its initial configuration by creating a Data Reporting Session

The call flow in figure 4.2.4.2-1 shows the interaction between the Indirect Data Collection Client and the Data Collection AF at the initial configuration of the Indirect Data Collection Client.

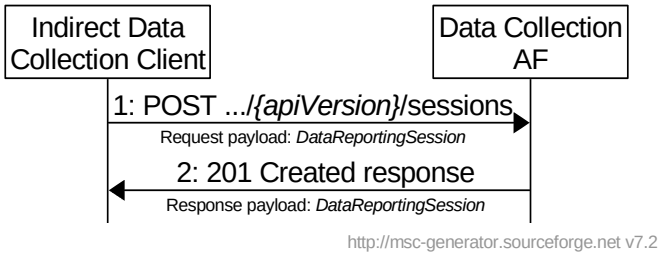

Figure 4.2.4.2-1: Initial configuration of Indirect Data Collection Client

The steps in this procedure are as follows:

1. The Indirect Data Collection Client invokes the *Ndcaf_DataReporting_CreateSession* service operation by sending an HTTP `POST` request to the Data Collection AF (see clauses 7.2.2.2 and 7.2.2.3.1). A *DataReportingSession* resource entity (see clause 7.3.2.1) is included in the request message body, but only properties *externalApplicationId* and *supportedDomains* are present (because the other properties are unknown to the Indirect Data Collection Client).

2. In its *201 Created* response, the Data Collection AF provides a *DataReportingSession* resource entity in the message body, which expands the content of the request message body in step 1 by adding the properties *sessionId*, *validUntil*, *reportForDomains* and *reportingCondition*. HTTP cache control headers are set on the response message in accordance with clause 5.3.2.1.

The Indirect Data Collection Client is now configured.

4.2.4.3 Updating and renewing data collection and reporting configuration

4.2.4.3.1 Introduction

The data collection and reporting configuration may change as a result of subscriptions to events exposed by the Data Collection AF, for example, as a result of narrower or wider filters applied to an event subscription. There are two ways for a modified data collection and reporting configuration to be acquired by the Indirect Data Collection Client:

1. The Indirect Data Collection Client invokes the *Ndcaf_DataReporting_RetrieveSession* service operation (see clause 4.2.4.3.2).
2. The Data Collection AF supplies a *DataReportingSession* in response to a data report submitted by the Indirect Data Collection Client (see clause 4.2.4.3.3).

4.2.4.3.2 Indirect Data Collection Client retrieves up-to-date configuration

This operation is typically performed when the current *DataReportingSession* stored in the Indirect Data Collection Client is about to expire.

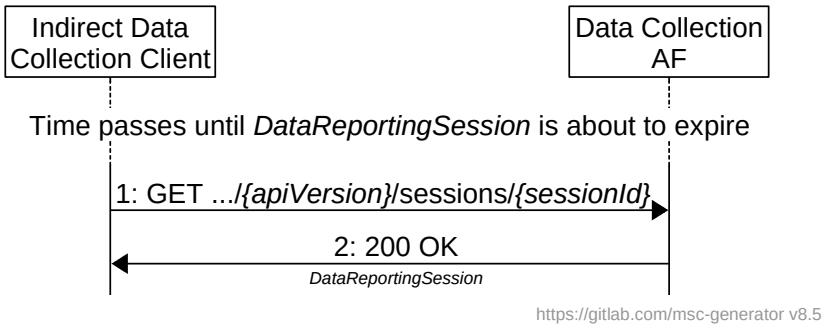

Figure 4.2.4.3.2-1: Indirect Data Collection Client retrieves up-to-date DataReportingSession

The steps in this procedure are as follows:

1. The Indirect Data Collection Client requests the *DataReportingSession* for the current session by using the *Ndcaf_DataReporting _RetrieveSession* service operation (see clauses 7.2.3.2 and 7.2.3.3.1).
2. The Data Collection AF provides the latest *DataReportingSession* in the message body of a *200 OK* response. In addition, the Data Collection AF may change properties *reportForDomains* and *reportingCondition*. HTTP cache control headers are set on the response message in accordance with clause 5.3.2.1

4.2.4.3.3 DataReportingSession updated in response to data reporting

See clause 4.2.6.

4.2.4.4 Indirect Data Collection Client destroys Data Reporting Session

The Indirect Data Collection Client may destroy a Data Reporting Session and the data collection and reporting configuration it represents by invoking the *Ndcaf_DataReporting_DestroySession* service operation.

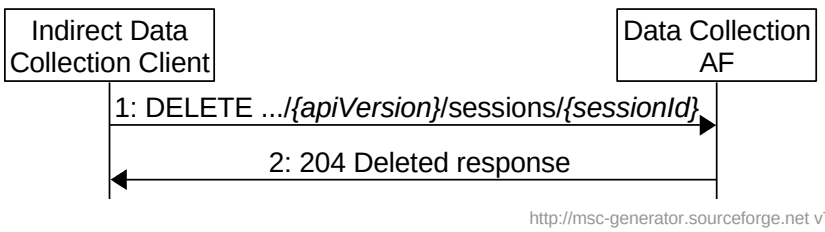

Figure 4.2.4.4-1: Indirect Data Collection Client destroys DataReportingSession

The steps in this procedure are as follows:

1. The Indirect Data Collection Client invokes the *Ndcaf_DataReporting_DestroySession* service operation by sending an HTTP `DELETE` request to the Data Collection AF (see clauses 7.2.3.2 and 7.2.3.3.3).

2. The Data Collection AF acknowledges the destruction of the session and its configuration with a *204 No Content* response.

4.2.5 Configuration of Application Server

4.2.5.1 General

An Application Server (AS) instance, as a type of data collection client, acquires its domain-specific data collection and reporting configuration from a Data Collection AF instance by means of the *Ndcaf_DataReporting* service (either directly across reference point R4 or via an equivalent service exposed by the NEF, depending on whether the AS and the Data Collection AF reside in the same or separate trust domains).

Similar to clause 4.2.4, the AS shall obtain its configuration by invoking the *Ndcaf_DataReporting_CreateSession* service operation, as described under clause 7.2.2.3.1.

The configuration information is contained in a generic data collection and reporting configuration envelope that shall include at minimum the baseline configuration parameters defined in clause 4.6.3 of TS 26.531 [7]. The configuration shall specify the domain-specific parameters associated with the specified Event ID(s) to be reported to the Data Collection AF.

4.2.5.2 Application Server retrieves its initial configuration by creating a Data Reporting Session

The call flow in figure 4.2.5.2-1 shows the interaction between the Application Server and the Data Collection AF at the initial configuration of the Application Server.

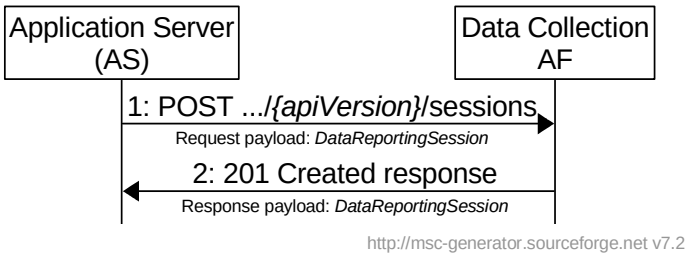

Figure 4.2.5.2-1: Initial configuration of Application Server

The steps in this procedure are as follows:

1. The Application Server invokes the *Ndcaf_DataReporting_CreateSession* service operation by sending an HTTP `POST` request to the Data Collection AF (see clauses 7.2.2.2 and 7.2.2.3.1). A *DataReportingSession* resource entity (see clause 7.3.2.1) is included in the request message body, but only properties *externalApplicationId* and *supportedDomains* are present (because the other properties are unknown to the Application Server).

2. In its *201 Created* response, the Data Collection AF provides a *DataReportingSession* resource entity in the message body, which expands the content of the request message body in step 1 by adding the properties *sessionId*, *reportForDomains* and *reportingCondition*. HTTP cache control headers are set on the response message in accordance with clause 5.3.2.1.

The Application Server is now configured.

4.2.5.3 Updating and renewing data collection and reporting configuration

4.2.5.3.1 Introduction

The data collection and reporting configuration may change as a result of subscriptions to events exposed by the Data Collection AF, for example, as a result of narrower or wider filters applied to an event subscription. There are two ways for a modified data collection and reporting configuration to be acquired by the Application Server:

1. The Application Server invokes the *Ndcaf_DataReporting_RetrieveSession* service operation (see clause 4.2.5.3.2).
2. The Data Collection AF supplies a *DataReportingSession* in response to a data report submitted by the Application Server (see clause 4.2.5.3.3).

4.2.5.3.2 Application Server retrieves up-to-date configuration

This operation is typically performed when the current *DataReportingSession* stored in the Application Server is about to expire.

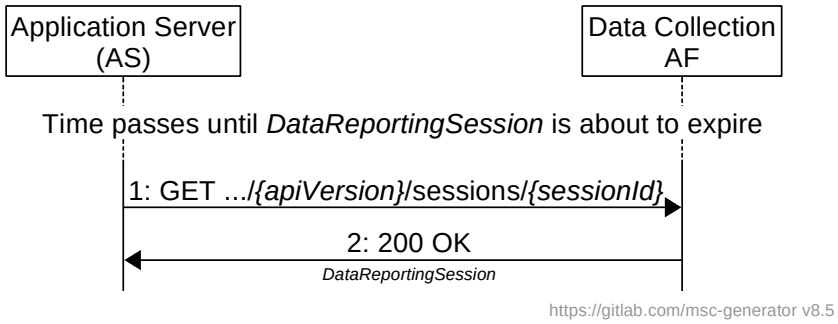

Figure 4.2.5.3.2-1: Application Server retrieves up-to-date DataReportingSession

The steps in this procedure are as follows:

1. The Application Server requests the *DataReportingSession* for the current session by using the *Ndcaf_DataReporting _RetrieveSession* service operation (see clauses 7.2.3.2 and 7.2.3.3.1).
2. The Data Collection AF provides the latest *DataReportingSession* in the message body of a *200 OK* response. The Data Collection AF may change properties *reportForDomains* and *reportingCondition*. HTTP cache control headers are set on the response message in accordance with clause 5.3.2.1

4.2.5.3.3 DataReportingSession updated in response to data reporting

See clause 4.2.7.

4.2.5.4 Application Server destroys Data Reporting Session

The Application Server may destroy a Data Reporting Session and the data collection and reporting configuration it represents by invoking the *Ndcaf_DataReporting_DestroySession* service operation.

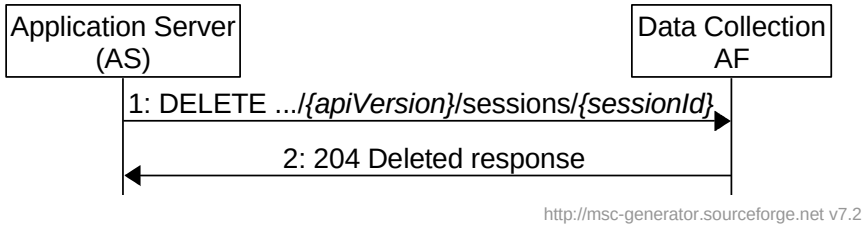

Figure 4.2.5.4-1: Application Server destroys DataReportingSession

The steps in this procedure are as follows:

1. The Application Server invokes the *Ndcaf_DataReporting_DestroySession* service operation by sending an HTTP `DELETE` request to the Data Collection AF (see clauses 7.2.3.2 and 7.2.3.3.3).

2. The Data Collection AF acknowledges the destruction of the session and its configuration with a *204 No Content* response.

4.2.6 Indirect data reporting

After acquiring its data collection and configuration from the Data Collection AF, and in accordance with this configuration, the Indirect Data Collection Client shall send reporting domain-specific data reports to the Data Collection AF by invoking the *Ndcaf_DataReporting_Report* service operation across reference point R3 as described under clause 7.2.3.4.1. The data reports shall be supplied in a generic data report envelope that includes at minimum the baseline information for data reporting defined in clause 4.6.4 of TS 26.531 [7].

The call flow in figure 4.2.6-1 shows the procedure for indirect data reporting.

NOTE: It is assumed that the Indirect Data Collection Client is already configured per the procedures specified in clause 4.2.4.

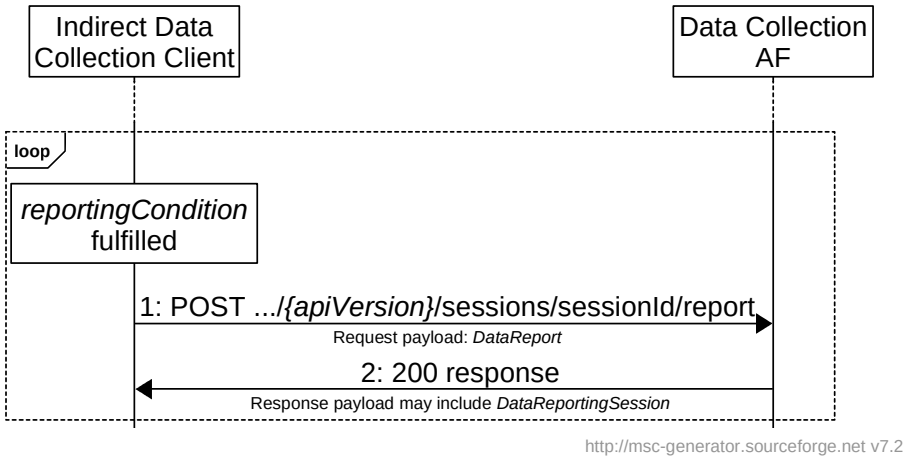

Figure 4.2.6-1: Indirect data reporting

1. When the *reportCondition* of a *DataReportingSession* is fulfilled, the Indirect Data Collection Client invokes the *Ndcaf_DataReporting_Report* service operation (see clauses 7.2.3.2 and 7.2.3.4.1) by issuing an HTTP `POST` request to the Data Collection AF. The request message body is a *DataReport* (see clause 7.3.2.3).

2. In the HTTP response the Data Collection AF may provide an up-to-date *DataReportingSession*. The Indirect Data Collection Client shall take note of any changes and act accordingly.

4.2.7 Reporting by Application Server

After acquiring its data collection and configuration from the Data Collection AF, and in accordance with this configuration, the Application Server shall send reporting domain-specific data reports to the Data Collection AF by invoking the *Ndcaf_DataReporting_Report* service operation across reference point R4 as described under clause 7.2.3.4.1. The data reports shall be supplied in a generic data report envelope that includes at minimum the baseline information for data reporting defined in clause 4.6.4 of TS 26.531 [7].

The call flow in figure 4.2.7-1 shows the procedure for data reporting by the Application Server.

NOTE: It is assumed that the Application Server is already configured per the procedures specified in clause 4.2.5.

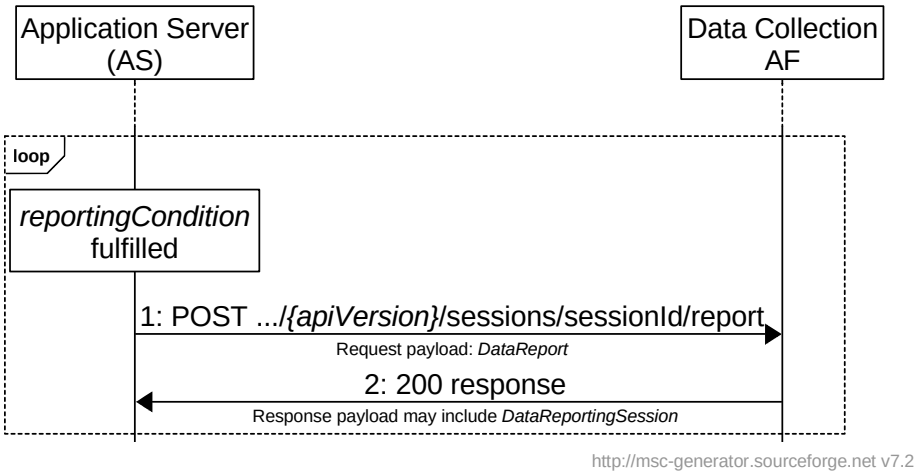

Figure 4.2.7-1: Data reporting by Application Server

1. When the *reportCondition* of a *DataReportingSession* is fulfilled, the Application Server invokes the *Ndcaf_DataReporting_Report* service operation (see clauses 7.2.3.2 and 7.2.3.4.1) by issuing an HTTP `POST` request to the Data Collection AF. The request message body is a *DataReport* (see clause 7.3.2.3).

2. In the HTTP response the Data Collection AF may provide an up-to-date *DataReportingSession*. The Application Server shall take note of any changes and act accordingly.

4.2.8 Event subscription, management and publication

This clause pertains to the use of the *Naf_EventExposure* service API as defined in TS 29.517 [5] and invoked by the NWDAF or an Application Server Provider AF to subscribe to and receive UE data related event information from a Data Collection AF.

4.3 UE-to-network procedures

4.3.1 General

This clause specifies the procedures used between the UE and Network Functions in support of provisioning a data collection and reporting configuration in the UE's Direct Data Collection Client, and subsequent reporting of the collected UE data to the Data Collection AF.

4.3.2 Configuration of Direct Data Reporting Client

4.3.2.1 General

A Direct Data Reporting Client instance acquires its domain-specific data collection and reporting configuration from a Data Collection AF instance by means of the *Ndcaf_DataReporting* service across reference point R2.

The Direct Data Reporting Client shall obtain its configuration by invoking the *Ndcaf_DataReporting_CreateSession* service operation, as described under clause 7.2.2.3.1.

The configuration information is contained in a generic data collection and reporting configuration envelope that shall include at minimum the baseline configuration parameters defined in clause 4.6.3 of TS 26.531 [7]. The configuration shall specify the domain-specific parameters associated with the specified Event ID(s) to be reported to the Data Collection AF.

4.3.2.2 Direct Data Collection Client retrieves its initial configuration by creating a Data Reporting Session

The call flow in figure 4.3.2.2-1 shows the interaction between the Direct Data Collection Client and the Data Collection AF at the initial configuration of the Direct Data Collection Client.

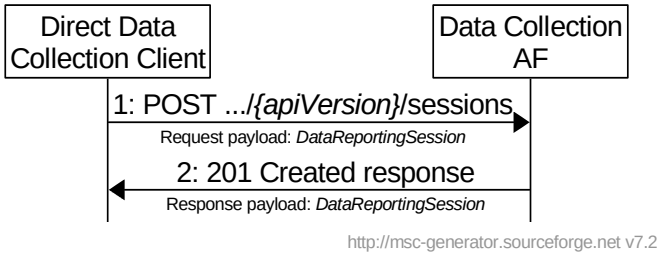

Figure 4.3.2.2-1: Initial configuration of Direct Data Collection Client

The steps in this procedure are as follows:

1. The Direct Data Collection Client invokes the *Ndcaf_DataReporting_CreateSession* service operation by sending an HTTP `POST` request to the Data Collection AF (see clauses 7.2.2.2 and 7.2.2.3.1). A *DataReportingSession* resource entity (see clause 7.3.2.1) is included in the request message body, but only properties *externalApplicationId* and *supportedDomains* are present (because the other properties are unknown to the Direct Data Collection Client).

2. In its *201 Created* response, the Data Collection AF provides an extended version of the *DataReportingSession* resource entity in the message body, adding the properties *sessionId*, *reportForDomains* and *reportingCondition* to the entity received from the Direct Data Collection Client in step 1. HTTP cache control headers are set on the response message in accordance with clause 5.3.2.1.

The Direct Data Collection Client is now configured.

4.3.2.3 Updating and renewing data collection and reporting configuration

4.3.2.3.1 Introduction

The data collection and reporting configuration may change as a result of subscriptions to events exposed by the Data Collection AF, for example, as a result of narrower or wider filters applied to an event subscription. There are two ways the data collection and reporting configuration can be updated or renewed by the Direct Data Collection Client:

1. The Direct Data Collection Client invokes the *Ndcaf_DataReporting_RetrieveSession* service operation (see clause 4.3.2.3.2).

2. The Data Collection AF supplies a *DataReportingSession* in response to a data report submitted by the Direct Data Collection Client (see clause 4.3.2.3.3).

4.3.2.3.2 Direct Data Collection Client retrieves up-to-date configuration

This operation is typically performed when the current *DataReportingSession* stored in the Direct Data Collection Client is about to expire.

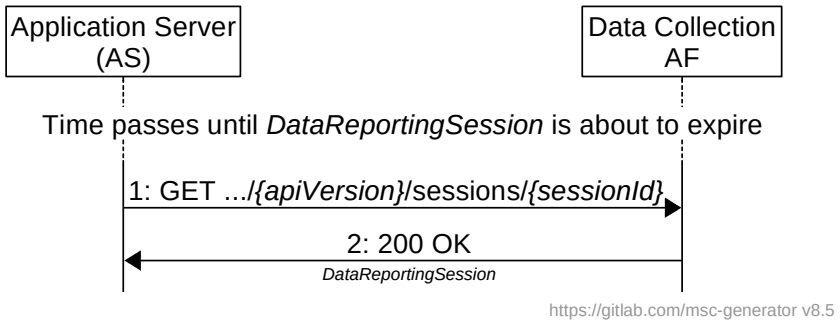

Figure 4.3.2.3.2-1: Direct Data Collection Client retrieves up-to-date DataReportingSession

The steps in this procedure are as follows:

1. The Direct Data Collection Client requests the *DataReportingSession* for the current session by using the *Ndcaf_DataReporting_RetrieveSession* service operation (see clauses 7.2.3.2 and 7.2.3.3.1).

2. The Data Collection AF provides the latest *DataReportingSession* in the message body of a *200 OK* response. The Data Collection AF may change properties *reportForDomains* and *reportingCondition*. HTTP cache control headers are set on the response message in accordance with clause 5.3.2.1.

4.3.2.3.3 DataReportingSession updated in response to data reporting

See clause 4.3.3.

4.3.2.4 Direct Data Collection Client destroys Data Reporting Session

The Direct Data Collection Client may destroy a Data Reporting Session and the data collection and reporting configuration it represents by invoking the *Ndcaf_DataReporting_DestroySession* service operation.

Figure 4.3.2.3-1: Direct Data Collection Client destroys DataReportingSession

The steps in this procedure are as follows:

1. The Direct Data Collection Client invokes the *Ndcaf_DataReporting_DestroySession* service operation by sending an HTTP `DELETE` request to the Data Collection AF (see clauses 7.2.2.2 and 7.2.3.3.3).

2. The Data Collection AF acknowledges the destruction of the session and its configuration with a *204 No Content* response.

4.3.3 Direct data reporting

After acquiring its data collection and configuration from the Data Collection AF, and in accordance with this configuration, the Direct Data Collection Client shall send domain-specific data reports to the Data Collection AF by invoking the *Ndcaf_DataReporting_Report* service operation across reference point R2 as described under clause 7.2.3.4.1. The data reports shall be supplied in a generic data report envelope that includes at minimum the baseline information for data reporting defined in clause 4.6.4 of TS 26.531 [7].

The call flow in figure 4.3.3-1 shows the procedure for direct data reporting.

NOTE: It is assumed that the Direct Data Collection Client is already configured per the procedures specified in clause 4.3.2.

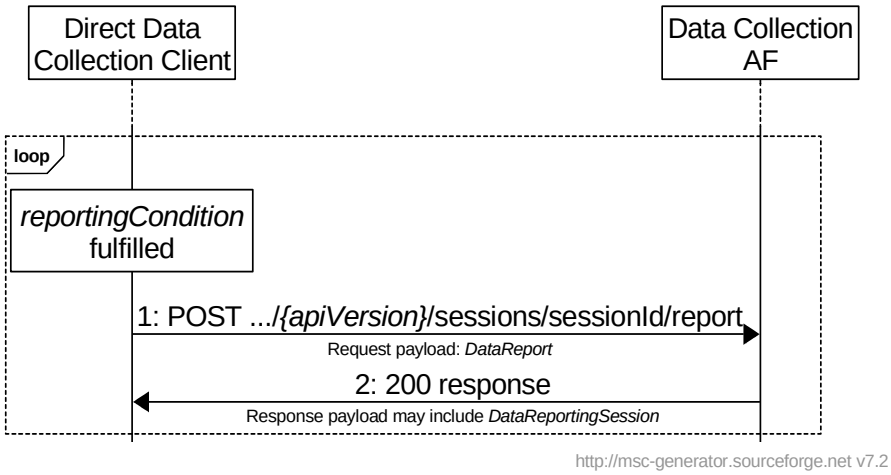

Figure 4.3.3-1: Direct data reporting

1. When the *reportCondition* of a *DataReportingSession* is fulfilled, the Direct Data Collection Client invokes the *Ndcaf_DataReporting_Report* service operation (see clauses 7.2.2.2 and 7.2.3.4.1) by issuing an HTTP `POST` request to the Data Collection AF. The request message body is a *DataReport* (see clause 7.3.2.3).

2. In the HTTP response the Data Collection AF may provide an up-to-date *DataReportingSession*. The Direct Data Collection Client shall take note of any changes and act accordingly.

4.4 UE-internal procedures

4.4.1 General

This clause specifies the procedures used by internal UE entities, namely a UE Application and the associated Direct Data Collection Client, in support of UE data collection by the Direct DC-Client for subsequent reporting to the DC-AF.

As described in clause 4.2 of TS 26.531 [7], the UE Application shares relevant data with the Direct Data Collection Client via reference point R7 using the API specified in clause 8. In this release, such data sharing is enabled by UE Application configuration via R7 as specified in the subsequent clauses.

The Direct Data Collection Client is presumed to operate as a background service, and its functionality is invoked upon activation of the UE Application (whose role or task is domain-specific).

Each running instance of a UE Application compliant with the present document shall be associated with a dedicated instance of the Direct Data Collection Client, i.e., a separate logical *data collection and reporting context* exists for each pair of UE Application instance and Data Collection Client instance. If there are multiple UE Applications running concurrently on a UE, each UE Application requires a unique data collection and reporting context mapped to a separate Data Reporting Session at reference point R2.

4.4.2 Application registration procedure

Upon activation, the UE Application requests its UE data collection and reporting configuration from the Direct Data Collection Client by invoking the *registerUeApplication* method at reference point R7. The UE Application provides as input parameters its External Application Identifier, Application Service Provider identifier, and information on its callback listener (for receiving notifications from the Direct Data Collection Client). Using another input parameter, the UE Application also indicates its consent for the UE identity (i.e. GPSI) to be included in Data Reports sent to the Data Collection AF.

As a consequence, the Direct Data Collection Client establishes a new Data Reporting Session with the Data Collection AF using the procedure specified in clause 4.3.2.2. The *Ndcaf_DataReporting_CreateSession* invocation includes the GPSI of the UE (if consent is given by the UE Application) or otherwise the Direct Data Collection Client shall instead generate an opaque client reporting identifier that is globally unique and stable (e.g. a UUID) and include this in the invocation of the service operation.

If successful, the Direct Data Collection Client returns a UE data collection and reporting configuration to the UE Application based on the information returned by the Data Collection AF in the newly created Data Reporting Session resource. As indicated in TS 26.531 [7], a generic envelope containing that data collection and reporting configuration information is employed and its content, as indicated in table 4.6.3-1 of [7], is reporting domain-specific.

4.4.4 Data reporting procedure

The UE Application reports data to the Direct Data Collection Client by invoking the *reportUeData* method on the Direct Data Collection Client at reference point R7.

As a consequence, the Direct Data Collection Client may report the UE data provided by invoking the procedure specified in clause 4.3.3. Depending on the Data Reporting Configuration, the Direct Data Collection Client may instead store the UE data and forward it later. If the UE Application has instructed the Direct Data Collection Client to prioritise immediate delivery of a UE data report *by setting the expedite* directive, the Direct Data Collection Client forwards the UE data by invoking the procedure specified in clause 4.3.3 on the basis that the reporting condition for the data domain in question has been fulfilled.

4.4.5 Configuration update procedure

The Direct Data Collection Client notifies the UE Application of changes to the UE data collection and reporting configuration by sending a *dataCollectionAndReportingConfigurationChanged* callback notification.

The UE Application responds by invoking the *getDataCollectionAndReportingConfiguration* method at reference point R7 to obtain the new configuration and acts upon it accordingly.

4.4.6 Procedure for changing consent to report the UE identifier

The UE Application can change its consent to reveal the GPSI of the UE in Data Reports sent to the Data Collection AF during the course of a data reporting session by invoking the *setUserConsent* method on the Direct Data Collection Client at reference point R7.

As a consequence, the Direct Data Collection Client shall destroy the current Data Reporting Session and create a new one that includes either the GPSI of the UE or the opaque client reporting identifier, according to whether consent is granted or withdrawn.

4.4.7 Procedure for changing the opaque client reporting identifier

The UE Application may reset the opaque client reporting identifier at any time by invoking the *resetClientReporting Identifier* method at reference point R7.

As a consequence, the Direct Data Reporting Client shall destroy the current Data Reporting Session. It shall generate a new opaque client reporting identifier (e.g. UUID) and shall include this value when invoking the procedure to create a replacement Data Reporting Session specified in clause 4.3.2.2.

4.4.8 Application deregistration procedure

Upon deactivation, the UE Application revokes its data collection and reporting context by invoking the *deregisterUe Application* method at reference point R7.

As a consequence, the Direct Data Collection Client shall destroy the Data Reporting Session using the procedure specified in clause 4.3.2.4 after first flushing any unreported UE data using the procedure specified in clause 4.3.3.

5 General Aspects of APIs for Data Collection and Reporting

5.1 Overview

The data model for the *Ndcaf_DataReportingProvisioning* specified in clause 6 and the *Ndcaf_DataReporting* service specified in clause 7 is depicted in figure 5.1-1.

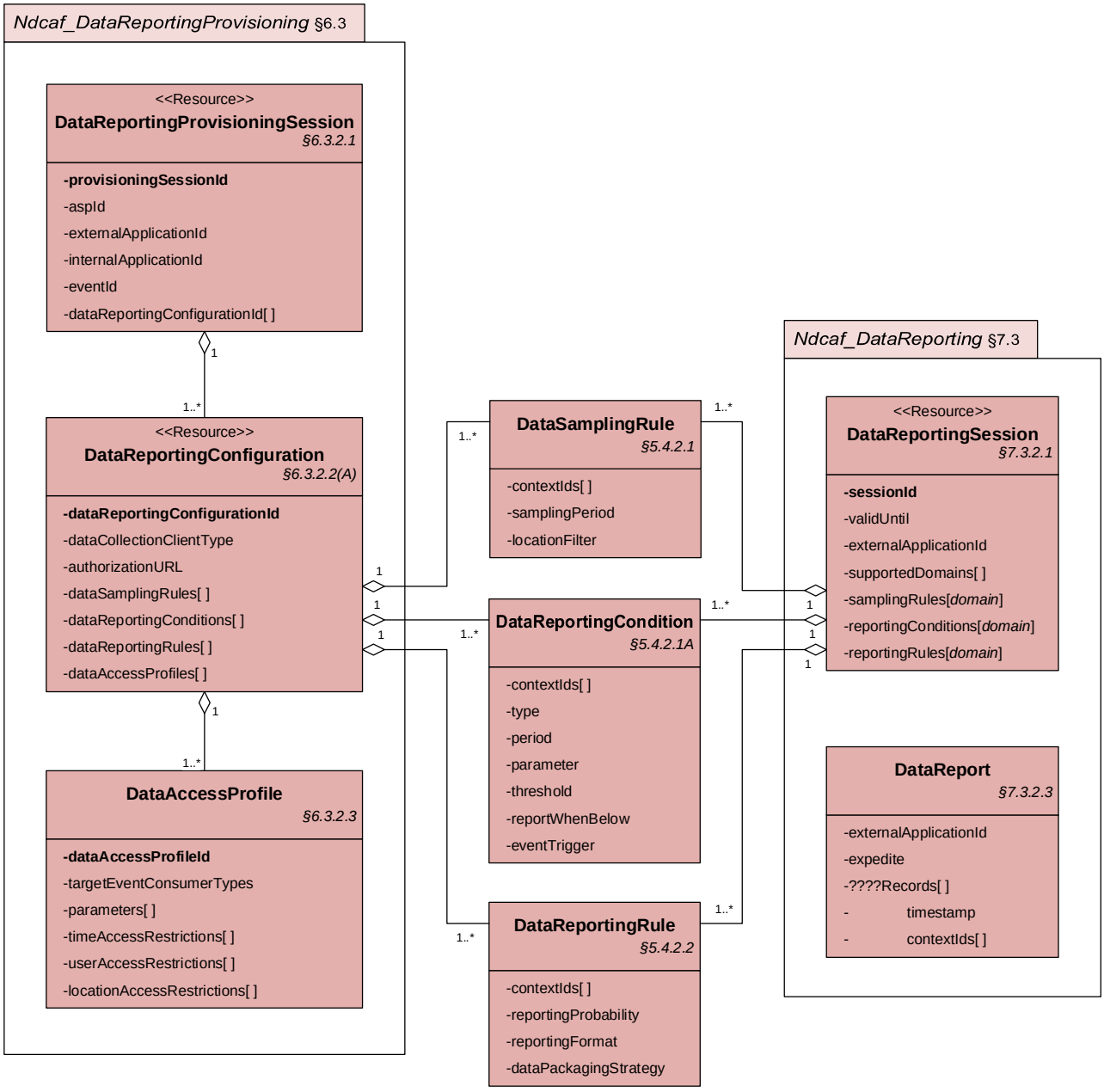

Figure 5.1-1: Data model for *Ndcaf_DataReportingProvisioning* and *Ndcaf_DataReporting* services

5.2 HTTP resource URIs and paths

The resource URI used in each HTTP request to the API provider shall have the structure defined in subclause 4.4.1 of TS 29.501 [17], i.e.:

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

with the following components:

- *{apiRoot}* shall be set as described in TS 29.501 [17].
- *{apiName}* shall be set as defined by the following clauses.
- *{apiVersion}* shall be set to "v1".
- *{apiSpecificResourceUriPart}* shall be set as described in the following clauses.

5.3 Usage of HTTP

5.3.1 HTTP protocol version

The version-independent semantics of HTTP specified in RFC 9110 [20] shall be followed.

For interfaces internal to 5GC, HTTP/2, RFC 9113 [18], shall be used as specified in clause 5.2 of TS 29.500 [9].

For other interfaces, support of HTTP/1.1 (per RFC 9112 [19]) over TLS is mandatory and support of HTTP/2 (per RFC 9113 [18]) over TLS is recommended.

5.3.2 HTTP standard headers

5.3.2.1 General

See clause 5.2.2 of TS 29.500 [9] for the usage of HTTP standard headers.

5.3.2.2 Origin

The `Origin` header shall be supported by the Data Collection AF at reference points R1, R2, R3 and R4.

5.3.2.3 Content type

The format of HTTP message bodies specified in the present document shall be JSON as specified in clause 5.4 of 3GPP TS 29.500 [9]. The use of the JSON format shall be signalled by the content type "application/json", as specified in section 11 of IETF RFC 8259 [12].

5.3.2.4 Access-Control-Allow-Origin

The `Access-Control-Allow-Origin` header shall be supported by the Data Collection AF at reference points R1, R2, R3, R4.

5.3.2.5 Access-Control-Allow-Methods

The `Access-Control-Allow-Methods` header shall be supported by the Data Collection AF at reference points R1, R2, R3 and R4.

5.3.2.6 Access-Control-Allow-Headers

The `Access-Control-Allow-Headers` header shall be supported by the Data Collection AF at reference points R1, R2, R3 and R4.

5.3.2.7 Cache-Control

The caching semantics specified in RFC 9110 [20] and RFC 9111 [23] shall be followed.

5.3.3 HTTP response codes

Guidelines for HTTP *4xx (Client Error)* status codes in response to the invocation of the UE data collection and reporting APIs defined in clauses 6 and 7 are specified in clause 4.8 of TS 29.501 [17].

5.4 Common API data types

5.4.0 General

Table 5.4.0-1 specifies data types re-used from other specifications by the common API data types defined in clause 5.4, including a reference to their respective specifications.

Table 5.4.0-1: Externally defined data types used by common data types

Data type	Comments	Reference
Float	A floating-point number.	TS 29.571 [12]
Uri	A Uniform Resource Identifier.	
Percentage	A proportion represented as a floating-point number between 0.0 and 100.0.	TS 26.510 [13]
LocationArea5G	A list of areas where the UE is located.	TS 29.122 [14]

5.4.1 Simple data types

5.4.2 Structured data types

5.4.2.1 DataSamplingRule type

Table 5.4.2.1-1 Definition of DataSamplingRule type

Property name	Data type	Cardinality	Usage	Description
contextIds	*array(string)*	1..1	C: RO U: RO	A non-empty set of provisioned configuration contexts from which this data sampling rule is derived. These context identifiers are to be included in Data Reports comprising data samples arising from this data sampling rule.
samplingPeriod	*Float*	0..1	C: RW U: RW	How often (expressed in seconds) the UE data parameter(s) are to be measured and logged by the data collection client.
locationFilter	*array(LocationArea5G)*	0..1	C: RW U: RW	Indication of the UE location(s) at which UE data parameter(s) are to be collected by the data collection client.
NOTE: A logical conjunction (i.e., Boolean AND) is meant when more than one property is present in the same information element – i.e., data is to be collected at the indicated sampling frequency when the UE is present at any of the indicated locations.				

5.4.2.1A DataReportingCondition type

Table 5.4.2.1A-1: Definition of DataReportingCondition type

Property name	Data type	P	Cardinality	Description
contextIds	*array(string)*	M	1..*	A non-empty set of provisioned configuration contexts from which this data reporting condition is derived. These context identifiers are used by the data reporting client to correlate this data reporting condition with corresponding data sampling rules and data reporting rules.
type	*ReportingConditionType*	M	1	Type of reporting condition (see clause 5.4.3.2).
period	*DurationSec*	C	0..1	The time period between UE data reports. Only present when type is *INTERVAL*.
parameter	*string*	C	0..1	Identifies the parameter that triggers a UE data report when it crosses the value *threshold*. Only present when *type* is *THRESHOLD*.
threshold	*Double, Float, Int32, Int64, Uint16, Uint32, Uint64*, or *Uinteger*	C	0..1	The value that *parameter* must cross to trigger a UE data report. Only present when *type* is *THRESHOLD*.
reportWhenBelow	*boolean*	C	0..1	The direction in which the threshold must be crossed to trigger a UE data report. If *true*, a report is triggered when the value of *parameter* drops below *threshold*. If *false*, a report is triggered when the value of *parameter* exceeds *threshold*. Only present when *type* is *THRESHOLD*.
eventTrigger	*ReportingEventTrigger*	C	0..1	The type of event that triggers a UE data report (see clause 5.4.3.3). Only present when *type* is *EVENT*.

5.4.2.2 DataReportingRule type

Table 5.4.2.2-1 Definition of DataReportingRule type

Property name	Data type	Cardinality	Usage	Description
contextIds	*array(string)*	1..1	C: RO U: RO	A non-empty set of provisioned configuration contexts from which this data reporting rule is derived. These context identifiers are used by the data reporting client to correlate this data reporting rule with corresponding data sampling rules and data reporting conditions.
reportingProbability	*Percentage*	0..1	C: RW U: RW	The probability of reporting by the data collection client of the UE data parameter(s) it has logged. If omitted, the default value of this parameter shall be 100 percent. On each occasion the reporting condition (see clause 7.3.2.2) is met, the data collection client shall use a random number generator to produce an integer value between 0 and 100, and a report is sent to the Data Collection AF if the random value is less than or equal to this parameter.
reportingFormat	*Uri*	0..1	C: RW U: RW	Deprecated in this release. A default reporting format for the data domain in question shall be assumed.
dataPackaging Strategy	*string*	0..1	C: RW U: RW	Strategy for packaging UE data into reports sent to the Data Collection AF (e.g., maximum number of data records per report, maximum report size). See clause 10. If absent, the data collection client should employ the default data packaging strategy specified by the indicated reporting format or, in the absence of such specification, any reasonable data packaging strategy.
NOTE: A logical conjunction (i.e., Boolean AND) is meant when more than one property is present in the same information element – i.e., data is to be reported with the indicated probability, according to the indicated reporting format and data packaging strategy.				

5.4.3 Enumerated data types

5.4.3.1 DataCollectionClientType enumeration

Enumeration of the *DataCollectionClientType* is defined in table 5.4.3.1-1.

Table 5.4.3.1-1 Enumeration of DataCollectionClientType

Enumeration value	Description
DIRECT	Direct Data Collection Client.
INDIRECT	Indirect Data Collection Client.
APPLICATION_SERVER	Application Server performing the role of a data collection client.

5.4.3.2 DataReportingConditionType enumeration

Table 5.4.3.2-1: DataReportingConditionType enumeration

Enumeration value	Description
INTERVAL	Report at a regular interval.
THRESHOLD	Report when a threshold is passed.
EVENT	Report on event.

5.4.3.3 DataReportingEventTrigger enumeration

This enumeration lists the possible events (*EVENT* in table 5.4.3.2-1) that may be used to trigger the submission of a UE data report to the Data Collection AF.

Table 5.4.3.3-1: DataReportingEventTrigger enumeration

Enumeration value	Description
LOCATION	A new location has been entered (refer to clause A.3).
DESTINATION	A new destination has been recorded (refer to clause A.7).

5.5 Explanation of API data model notation

The data models in the following API clauses are specified using the following notational conventions:

1. Data models are expressed as an unordered list of JSON properties [28] with one property defined in each row of the data model table.

2. The *Data type* column defines the type of the property, according to JSON notation [28].

3. The keyword *Array* in the *Data type* column indicates that zero or more elements of the data type in brackets are included. The number of elements in the array may additionally be constrained by normative text in the *Description* column.

4. The *Cardinality* column defines whether a property is optional or mandatory. An array with cardinality 0 indicates that the array property is optional in the data structure. An array with cardinality 1 indicates that the property is mandatory in the data structure, even when the array is empty.

5. The keyword *Object* in the *Data type* column indicates a structured sub-object of an unnamed type whose properties are defined inline in the indented table rows immediately afterwards. The *Object* type may be combined with the *Array* type.

6. In the case of data types specifying RESTful resources, the additional *Usage* column defines the property behaviour for each CRUD Operation as follows:

   - "C" (Create), "R" (Retrieve) and "U" (Update) refers to the CRUD procedure during which the property is present in the resource type. (The Delete operation never takes any input data type.)

   - "RO" signifies a read-only property. Only the API provider function is permitted to modify the property value. The API invoker is only permitted to read the value. Any attempt by the API invoker to set the value in a Create or Update operation is ignored by the API provider.

   - "WO" signifies a write-only property. The API invoker is permitted to include the property in Create or Update request messages, but the property is not present in responses to Retrieve operations.

   - "RW" signifies a read/write property. The API provider and API invoker may both modify the property value.

7. An additional read-only property (denoted "C: RO" and "R: RO") is included at the start of all data models defining resources that are members of a RESTful collection. This property is populated by the API provider at the point of creation with the unique identifier of the resource within its parent collection, and the value of this property corresponds to the leaf path element in the RESTful URL of the created resource.

6 Ndcaf_DataReportingProvisioning service

6.1 General

This clause specifies the API used by the Provisioning AF of an Application Service Provider to create and manage one or more Data Reporting Provisioning Session resources in the Data Collection AF, and for each Data Reporting Provisioning Session, to create and manipulate its subordinate Data Reporting Configuration resource.

6.2 Resources

6.2.1 Resource structure

Figure 6.2.1-1 depicts the URL path model for the *Ndcaf_DataReportingProvisioning* service.

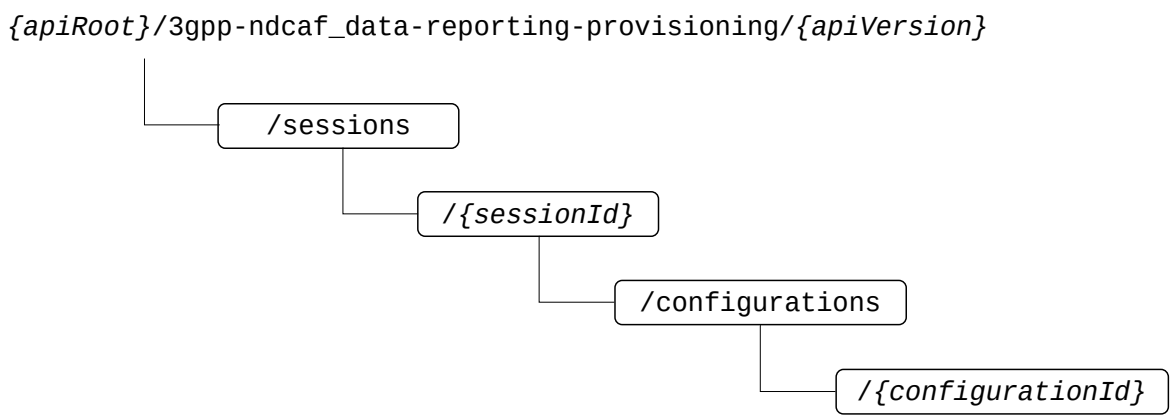

Figure 6.2.1-1: URL path model of Ndcaf_DataReportingProvisioning service API

Table 6.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.2.1-1: Resources and methods overview

Service name	Operation name	Resource name	Resource path suffix	HTTP method	Description
Ndcaf_DataReporting Provisioning	*CreateSession*	Data Reporting Provisioning Sessions collection	/sessions	POST	Provisioning AF establishes a Data Reporting Provisioning Session resource at the Data Collection AF.
	RetrieveSession	Data Reporting Provisioning Session	/sessions/*{sessionId}*	GET	Retrieves an existing Data Reporting Provisioning Session resource from the Data Collection AF.
	DestroySession			DELETE	Destroys a Data Reporting Provisioning Session resource.
	CreateConfiguration	Data Reporting Configurations collection	/sessions/*{sessionId}*/ configurations	POST	Creates a Data Reporting Configuration resource at the Data Collection AF.
	RetrieveConfiguration	Data Reporting Configuration	/sessions/*{sessionId}*/ configurations/ *{configurationId}*	GET	Retrieves an existing Data Reporting Configuration resource from the Data Collection AF.
	UpdateConfiguration			PUT, PATCH	Modifies an existing Data Reporting Configuration resource at the Data Collection AF.
	DestroyConfiguration			DELETE	Destroys a Data Reporting Configuration resource at the Data Collection AF.

6.2.2 Data Reporting Provisioning Sessions resource collection

6.2.2.1 Description

The Data Reporting Provisioning Sessions resource collection represents the set of all Data Reporting Provisioning Sessions at a given Data Collection AF (service) instance. The resource collection enables a Provisioning AF to create and manage individual Data Reporting Provisioning Session resources at the Data Collection AF.

6.2.2.2 Resource definition

Resource URL: **{apiRoot}/3gpp-ndcaf_data-reporting-provisioning/{apiVersion}/sessions**

This resource shall support the resource URL variables defined in table 6.2.2.2-1.

Table 6.2.2.2-1: Resource URL variables for this resource

Name	Data type	Definition
apiRoot	*string*	See clause 5.2.
apiVersion		See clause 5.2.

6.2.2.3 Resource Standard Methods

6.2.2.3.1 Ndcaf_DataReportingProvisioning_CreateSession operation using POST method

This service operation shall support the URL query parameters specified in table 6.2.2.3.1-1.

Table 6.2.2.3.1-1: URL query parameters supported by the POST method on this resource

Parameter	Data type	P	Cardinality	Description

This service operation shall support the request data structures specified in table 6.2.2.3.1-2, the request headers specified in table 6.2.2.3.1-3. and the response data structures and response codes specified in table 6.2.2.3.1-4.

Table 6.2.2.3.1-2: Data structures supported by the POST request body on this resource

Data type	P	Cardinality	Description
DataReportingProvisioning Session	M	1	Data supplied by the Provisioning AF to enable creation of a new Data Reporting Provisioning Session at the Data Collection AF.

Table 6.2.2.3.1-3: Headers supported for POST requests on this resource

HTTP request header	Data type	P	Cardinality	Description
`Authorization`	*string*	M	1	For authentication of the Provisioning AF (see NOTE).
`Origin`	*string*	O	0..1	Indicates the origin of the requester.
NOTE: If OAuth 2.0 authorization is used the value is *Bearer* followed by a string representing the access token, see section 2.1 of RFC 6750 [8].				

Table 6.2.2.3.1-4: Data structures supported by the POST response body on this resource

Data type	P	Cardinality	Response codes	Description
DataReportingProvisioningSession	M	1	201 Created	The creation of a Data Reporting Provisioning Session resource is confirmed by the Data Collection AF.
NOTE: The mandatory HTTP error status codes for the `POST` method listed in table 5.2.7.1-1 of TS 29.500 [9] also apply.				

Table 6.2.2.3.1-5: Headers supported by the *201* (*Created*) response code on this resource

HTTP response header	Data type	P	Cardinality	Description
`Location`	*string*	M	1	The URL of the newly created resource at the Data Collection AF, according to the structure: {apiRoot}/ndcaf-data-reporting-provisioning/{apiVersion}/sessions/{sessionId}
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE*
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *Location*

NOTE: Standard HTTP redirection using a 3xx response code with the `Location` header as well as `Alt-Svc` are allowed.

6.2.3 Data Reporting Provisioning Session resource

6.2.3.1 Description

The Data Reporting Provisioning Session resource represents a single session within the collection of Data Reporting Provisioning Sessions at a given Data Collection AF service instance.

6.2.3.2 Resource definition

Resource URL: **{apiRoot}/3gpp-ndcaf_data-reporting-provisioning/{apiVersion}/sessions/{sessionionId}**

This resource shall support the resource URI variables defined in table 6.2.3.2-1.

Table 6.2.3.2-1: Resource URL variables for this resource

Name	Data type	Definition
apiRoot	*string*	See clause 5.2.
apiVersion	*String*	See clause 5.2
sessionId	*string*	Identifier of the Data Reporting Provisioning Session at the Data Collection AF.

6.2.3.3 Resource standard methods

6.2.3.3.1 Ndcaf_DataReportingProvisioning_RetrieveSession operation using GET method

This method shall support the URL query parameters specified in table 6.2.3.3.1-1 and the request headers specified in table 6.2.3.3.1-2.

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

Name	Data type	P	Cardinality	Description

Table 6.2.3.3.1-2: Headers supported for GET requests on this resource

HTTP request header	Data type	P	Cardinality	Description
`Authorization`	*string*	M	1	For authentication of the Provisioning AF (see NOTE).
`Origin`	*string*	O	0..1	Indicates the origin of the requester.
NOTE: If OAuth 2.0 authorization is used, the value is *Bearer* followed by a string representing the access token, see section 2.1 RFC 6750 [8].				

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

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
DataReportingProvisioningSession	M	1	200 OK	The requested Data Reporting Provisioning Session resource is returned to the Provisioning AF by the Data Collection AF.
ProblemDetails	O	0..1	307 Temporary Redirect	Temporary redirection during a Data Reporting Session Provisioning session retrieval procedure. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" (Extended Support of HTTP 307/308 redirection as defined in TS 29.502 [11]) is supported.
ProblemDetails	O	0..1	308 Permanent Redirect	Permanent redirection during a Data Reporting Session Provisioning session retrieval procedure. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" is supported.
ProblemDetails	O	0..1	404 Not Found	This Data Reporting Provisioning Session resource does not exist (see NOTE 2).
NOTE 1: The mandatory HTTP error status codes for the `GET` method as listed in table 5.2.7.1-1 of TS 29.500 [9] also apply. NOTE 2: Failure cases are described in subclause 6.2.4.				

Table 6.2.3.3.1-4: Headers supported by the 200 response code on this resource

HTTP response header	Data type	P	Cardinality	Description
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE*.
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the Origin header. Valid values: *Location*.

Table 6.2.3.3.1-5: Headers supported by the 307 and 308 response codes on this resource

HTTP response header	Data type	P	Cardinality	Description
`Location`	*string*	M	1	An alternative URL of the resource located in another Data Collection AF (service) instance.
`3gpp-Sbi-Target-Nf-Id`	*string*	O	0..1	Identifier of the target NF (service) instance towards which the request is redirected
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE*
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *Location*

6.2.3.3.2 Ndcaf_DataReportingProvisioning_UpdateSession operation

The PUT or PATCH method shall not be used as the update operation is not permitted on the Data Reporting Provisioning Session resource.

6.2.3.3.3 Ndcaf_DataReportingProvisioning_DestroySession operation using DELETE method

This service operation shall support the URL query parameters specified in table 6.2.3.3.3-1.

Table 6.2.3.3.3-1: URL query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description

This method shall support the request data structures and headers as specified in tables 6.2.3.3.3-2 and 6.2.3.3.3-3, respectively. Furthermore, this method shall support the response data structures as specified in table 6.2.3.3.3-4, and the different response codes as specified in tables 6.2.3.3.3-5 and 6.2.3.3.3-6, respectively.

Table 6.2.3.3.3-2: Data structures supported by the DELETE request body on this resource

Data type	P	Cardinality	Description

Table 6.2.3.3.3-3: Headers supported for DELETE requests on this resource

HTTP request header	Data type	P	Cardinality	Description
`Authorization`	*string*	M	1	For authentication of the Provisioning AF (see NOTE).
`Origin`	*string*	O	0..1	Indicates the origin of the requester.)
NOTE: If OAuth 2.0 authorization is used the value is *Bearer* followed by a string representing the access token, see section 2.1 of RFC 6750 [8].				

Table 6.2.3.3.3-4: Data structures supported by the DELETE response body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Success case: The Data Reporting Provisioning Session resource matching the *sessionId* was destroyed at the Data Collection AF.
ProblemDetails	O	0..1	307 Temporary Redirect	Temporary redirection during Data Reporting Provisioning Session destruction. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" as defined in TS 29.502 [11] is supported.
ProblemDetails	O	0..1	308 Permanent Redirect	Permanent redirection during Data Reporting Provisioning Session destruction. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" is supported.
ProblemDetails	O	0..1	404 Not Found	The Data Reporting Provisioning Session resource does not exist (see NOTE 2).
NOTE 1: The mandatory HTTP error status codes for the `DELETE` method listed in table 5.2.7.1-1 of TS 29.500 [9] also apply. NOTE 2: Failure cases are described in subclause 6.2.4.				

Table 6.2.3.3.3-5: Headers supported by the 204 response code on this resource

HTTP response header	Data type	P	Cardinality	Description
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE.*
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *Location*.

Table 6.2.3.3.3-6 Headers supported by the 307 and 308 response codes on this resource

HTTP response header	Data type	P	Cardinality	Description
`Location`	*string*	M	1	An alternative URL of the resource located in another Data Collection AF (service) instance.
`3gpp-Sbi-Target-Nf-Id`	*string*	O	0..1	Identifier of the target NF (service) instance towards which the request is redirected
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10].Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *PATCH, DELETE*.
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *Location*.

6.2.4 Data Reporting Configurations resource collection

6.2.4.1 Description

The Data Reporting Configurations resource collection represents the set of all Data Reporting Configurations that have been created within the scope of a particular Data Reporting Provisioning Session at a given Data CollectionAF (service) instance. The resource collection enables a Provisioning AF to create and manage individual Data Reporting Configuration resources at the Data Collection AF.

6.2.4.2 Resource definition

Resource URL: **{apiRoot}/3gpp-ndcaf_data-reporting-provisioning/{apiVersion}/sessions/{sessionId}/configurations/**

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

Table 6.2.4.2-1: Resource URL variables for this resource

Name	Data type	Definition
apiRoot	*string*	See clause 5.2.
apiVersion		See clause 5.2.
sessionId	*ResourceId*	Identifier of the Data Reporting Provisioning Session resource at the Data Collection AF.

6.2.4.3 Resource standard methods

6.2.4.3.1 Ndcaf_DataReportingProvisioning_CreateConfiguration operation using POST method

This service operation shall support the URL query parameters specified in table 6.2.4.3.1-1.

Table 6.2.4.3.1-1: URL query parameters supported by the POST method on this resource

Parameter	Data type	P	Cardinality	Description

This service operation shall support the request data structures and headers specified in tables 6.2.4.3.1-2 and 6.2.4.3.1-3, respectively, and the response data structures and response codes specified in table 6.2.4.3.1-4.

Table 6.2.4.3.1-2: Data structures supported by the POST request body on this resource

Data type	P	Cardinality	Description
DataReportingConfiguration	M	1	Configuration data supplied by the Provisioning AF to the Data Collection AF regarding UE data collection and reporting by data collection clients, and subsequent event exposure by the Data Collection AF.

Table 6.2.4.3.1-3: Headers supported for POST requests on this resource

HTTP request header	Data type	P	Cardinality	Description
`Authorization`	*string*	M	1	For authentication of the Provisioning AF (see NOTE).
`Origin`	*string*	O	0..1	Indicates the origin of the requester.
NOTE: If OAuth 2.0 authorization is used the value is *Bearer* followed by a string representing the access token, see section 2.1 of RFC 6750 [8].				

Table 6.2.4.3.1-4: Data structures supported by the POST response body on this resource

Data type	P	Cardinality	Response codes	Description
DataReportingConfiguration	M	1	201 Created	The creation of a Data Reporting Configuration resource is confirmed by the Data Collection AF.
NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of TS 29.500 [9] also apply.				

6.2.5 Data Reporting Configuration resource

6.2.5.1 Description

A Data Reporting Configuration represents a subordinate resource of a single Data Reporting Provisioning Session resource within the scope of an individual application of an Application Service Provider and associated event. As described in clause 4.2.3.3.2, it contains instructions for data collection clients regarding the collection, processing and reporting of UE data to the Data Collection AF, and may include data exposure restriction rules to be followed by the Data Collection AF for controlling event exposure by to subscriber entities.

6.2.5.2 Resource definition

Resource URL: **{apiRoot}/3gpp-ndcaf_data-reporting-provisioning/{apiVersion}/sessions/{sessionId}/configurations/{configurationId}**

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

Table 6.2.5.2-1: Resource URL variables for this resource

Name	Data type	Definition
apiRoot	*string*	See clause 5.2.
apiVersion		See clause 5.2.
sessionId	*ResourceId*	Identifier of the Data Reporting Provisioning Session resource at the Data Collection AF.
configurationId	*ResourceId*	Identifier of the Data Reporting Configuration resource at the Data Collection AF.

6.2.5.3 Resource standard methods

6.2.5.3.1 Ndcaf_DataReportingProvisioning_RetrieveConfiguration operation using GET method

This method shall support the URL query parameters specified in table 6.2.5.3.1-1 and the headers specified in table 6.2.5.3.1-2.

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

Name	Data type	P	Cardinality	Description

Table 6.2.5.3.1-2: Headers supported for GET requests on this resource

HTTP request header	Data type	P	Cardinality	Description
`Authorization`	*string*	M	1	For authentication of the Provisioning AF (see NOTE).
`Origin`	*string*	O	0..1	Indicates the origin of the requester.
NOTE: If OAuth 2.0 authorization is used, the value is *Bearer* followed by a string representing the access token, see section 2.1 RFC 6750 [8].				

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

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
DataReportingConfiguration	M	1	200 OK	The requested Data Reporting Configuration resource is returned to the Provisioning AF by the Data Collection AF.
ProblemDetails	O	0..1	307 Temporary Redirect	Temporary redirection during a Data Reporting Configuration retrieval procedure. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" (Extended Support of HTTP 307/308 redirection as defined in TS 29.502 [11]) is supported.
ProblemDetails	O	0..1	308 Permanent Redirect	Permanent redirection during a Data Reporting Session Configuration retrieval procedure. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" is supported.
ProblemDetails	O	0..1	404 Not Found	This Data Reporting Provisioning Session resource does not exist (see NOTE 2).
NOTE 1: The mandatory HTTP error status codes for the `GET` method as listed in table 5.2.7.1-1 of TS 29.500 [9] also apply. NOTE 2: Failure cases are described in clause 6.4.				

Table 6.2.5.3.1-4: Headers supported by the 200 response code on this resource

HTTP response header	Data type	P	Cardinality	Description
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE*.
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the Origin header. Valid values: *Location*.

Table 6.2.5.3.1-5: Headers supported by the 307 and 308 response codes on this resource

HTTP response header	Data type	P	Cardinality	Description
`Location`	*string*	M	1	An alternative URL of the resource located in another Data Collection AF (service) instance.
`3gpp-Sbi-Target-Nf-Id`	*string*	O	0..1	Identifier of the target NF (service) instance towards which the request is redirected
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE*
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *Location*

6.2.5.3.2 Ndcaf_DataReportingProvisioning_UpdateConfiguration operation using PUT or PATCH method

This method shall support the URL query parameters specified in table 6.2.5.3.2-1.

Table 6.2.5.3.2-1: URL query parameters supported by the PUT or PATCH method on this resource

Name	Data type	P	Cardinality	Description

The PUT and PATCH methods shall support the request data structures specified in tables 6.2.5.3.2-2 and 6.2.5.3.2-2a, respectively, the request headers specified in 6.2.5.3.2-3, and the response data structures and response codes specified in tables 6.2.5.3.2-4 and 6.2.5.3.2-5, respectively.

Table 6.2.5.3.2-2: Data structures supported by the PUT request body on this resource

Data type	P	Cardinality	Description
DataReportingConfiguration	M	1	Parameters to replace an existing Data Reporting Configuration resource.

Table 6.2.5.3.2-2a: Data structures supported by the PATCH request body on this resource

Data type	P	Cardinality	Description
DataReportingConfiguration Patch	M	1	Parameters to modify an existing Data Reporting Configuration resource.

Table 6.2.5.3.2-3: Headers supported for PUT or PATCH requests on this resource

HTTP request header	Data type	P	Cardinality	Description
`Authorization`	*string*	M	1	For authentication of the Provisioning AF (see NOTE).
`Origin`	*string*	O	0..1	Indicates the origin of the requester.
NOTE : If OAuth 2.0 authorization is used the value is *Bearer* followed by a string representing the access token, see section 2.1 RFC 6750 [8]				

Table 6.2.5.3.2-4: Data structures supported by the PUT or PATCH response body on this resource

Data type	P	Cardinality	Response codes	Description
DataReportingConfiguration	M	1	200 OK	Confirmation of successful replacement or modification of a Data Reporting Configuration resource, along with a representation of the status of the update operation, carried in the response body, is returned by the Data Collection AF.
n/a		0	204 No Content	Confirmation of successful replacement or modification of a Data Reporting Configuration resource is returned by the Data Collection AF, without an associated response body.
ProblemDetails	O	0..1	307 Temporary Redirect	Temporary redirection, during a Data Reporting Configuration update operation. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" (Extended Support of HTTP 307/308 redirection as defined in TS 29.502 [11]) is supported.
ProblemDetails	O	0..1	308 Permanent Redirect	Permanent redirection, during a Data Reporting Configuration update operation. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" is supported.
ProblemDetails	O	0..1	404 Not Found	This Data Reporting Configuration resource does not exist (see NOTE 2).
NOTE 1: The mandatory HTTP error status codes for the `PUT` and `PATCH` methods listed in table 5.2.7.1-1 of TS 29.500 [9] also apply. NOTE 2: Failure cases are described in clause 6.4.				

Table 6.2.5.3.2-5: Headers supported by the 200 or 204 response code on this resource

HTTP response header	Data type	P	Cardinality	Description
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE*.
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the Origin header. Valid values: *Location*.

Table 6.2.5.3.2-6: Headers supported by the 307 and 308 response codes on this resource

HTTP response header	Data type	P	Cardinality	Description
`Location`	*string*	M	1	An alternative URL of the resource located in another Data Collection AF (service) instance.
`3gpp-Sbi-Target-Nf-Id`	*string*	O	0..1	Identifier of the target NF (service) instance towards which the request is redirected
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *PATCH, DELETE*
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *Location*

6.2.5.3.3 Ndcaf_DataReportingProvisioning_DestroyConfiguration operation using DELETE method

This service operation shall support the URL query parameters specified in table 6.2.5.3.3-1.

Table 6.2.5.3.3-1: URL query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description

This method shall support the request data structures and headers specified in tables 6.2.5.3.3-2 and 6.2.5.3.3-3, respectively. Furthermore, this method shall support the response data structures specified in table 6.2.5.3.3-4, and the different response codes specified in tables 6.2.5.3.3-5 and 6.2.5.3.3-6, respectively.

Table 6.2.5.3.3-2: Data structures supported by the DELETE request body on this resource

Data type	P	Cardinality	Description

Table 6.2.5.3.3-3: Headers supported for DELETE requests on this resource

HTTP request header	Data type	P	Cardinality	Description
`Authorization`	*string*	M	1	For authentication of the Provisioning AF (see NOTE).
`Origin`	*string*	O	0..1	Indicates the origin of the requester.)
NOTE: If OAuth 2.0 authorization is used the value is *Bearer* followed by a string representing the access token, see section 2.1 of RFC 6750 [8].				

Table 6.2.5.3.3-4: Data structures supported by the DELETE response body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Success case: The Data Reporting Configuration resource matching the *configurationId* was destroyed at the Data Collection AF.
ProblemDetails	O	0..1	307 Temporary Redirect	Temporary redirection during Data Reporting Configuration destruction. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" as defined in TS 29.502 [11] is supported.
ProblemDetails	O	0..1	308 Permanent Redirect	Permanent redirection during Data Reporting Configuration destruction. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" is supported.
ProblemDetails	O	0..1	404 Not Found	The Data Reporting Configuration resource does not exist (see NOTE 2).
NOTE 1: The mandatory HTTP error status codes for the `DELETE` method listed in table 5.2.7.1-1 of TS 29.500 [9] also apply. NOTE 2: Failure cases are described in clause 6.4.				

Table 6.2.5.3.3-5: Headers supported by the 204 response code on this resource

HTTP response header	Data type	P	Cardinality	Description
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE*.
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *Location*.

Table 6.2.5.3.3-6 Headers supported by the 307 and 308 response codes on this resource

HTTP response header	Data type	P	Cardinality	Description
`Location`	*string*	M	1	An alternative URL of the resource located in another Data Collection AF (service) instance.
`3gpp-Sbi-Target-Nf-Id`	*string*	O	0..1	Identifier of the target NF (service) instance towards which the request is redirected
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10].Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *PATCH, DELETE*.
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *Location*.

6.3 Data model

6.3.1 General

Table 6.3.1-1 specifies the data types used by the *Ndcaf_DataReportingProvisioning* service operations.

Table 6.3.1-1: Data types specific to Ndcaf_DataReportingProvisioning service operations

Data type	Clause defined	Description
DataReportingProvisioningSession	6.3.2.1	A session provisioned in the Data Collection AF for the purpose of collecting, reporting and exposing UE data for a particular type of Event.
DataReportingConfiguration	6.3.2.2	The provisioned configuration for one type of data collection client within the scope of a Data Reporting Provisioning Session.
DataReportingConfigurationPatch	6.3.2.2A	Parameters to be modified in an existing provisioned configuration for one type of data collection client within the scope of a Data Reporting Provisioning Session.

Table 6.3.1-2 specifies data types re-used from other specifications by the *Ndcaf_DataReportingProvisioning* service operations, including a reference to their respective specifications.

Table 6.3.1-2: Externally defined data types used by Ndcaf_DataReportingProvisioning service operations

Data type	Comments	Reference
AfEvent	Identifies a type of event.	TS 29.517 [5]
ApplicationId	Identifies the reporting application.	TS 29.571 [12]
DateTime	A point in time, expressed as an ISO 8601 [25] date and time.	
DurationSec	A period of time, expressed in seconds.	
Double		
Float		
Int32		
Int64		
Uint16		
Uint32		
Uint64		
Uinteger		

6.3.2 Structured data types

6.3.2.1 DataReportingProvisioningSession resource type

Table 6.3.2.1-1: Definition of DataReportingProvisioningSession resource type

Property name	Data type	Cardinality	Usage	Description
provisioningSessionId	*string*	1..1	C: RO R: RO U: RO	A unique identifier for this Data Reporting Provisioning Session assigned by the Data Collection AF when the resource is created.
aspId	*AspId*	1..1	C: W R: RO U: RO	The identity of the Application Service Provider (as specified in clause 5.6.2.3 of TS 29.514 [26]) whose Provisioning AF is responsible for this Data Reporting Provisioning Session.
externalApplicationId	*ApplicationID*	1..1	C: RW R: RO U: RO	The external application identifier (see TS 29.571 [12]), nominated by the Provisioning AF, to which this Data Reporting Provisioning Session pertains, and which is present in data reports submitted to the Data Collection AF. This property may also be used by the Event Consumer AF (located outside trusted domain) to subscribe to events in the Data Collection AF (located inside trusted domain).
internalApplicationId	*ApplicationID*	0..1	C: RW R: RO U: RO	The internal application identifier (see TS 29.571 [12]) to be used by event consumers inside the trusted domain (including the NWDAF, the Event Consumer AF and the NEF) when subscribing to events in the Data Collection AF. This shall be provided by a Provisioning AF deployed inside the trusted domain when it creates a Data Reporting Provisioning Session. When the Provisioning AF is deployed outside the trusted domain, the NEF shall supply this property on behalf of the Provisioning AF by translating the *externalApplicationId* value supplied above into the corresponding internal application identifier here. Always present when this Data Reporting Provisioning Session is returned to an entity inside the trusted domain. Never present when the Data Reporting Provisioning Session is returned to an entity outside the trusted domain.
eventId	*AfEvent*	1..1	C: RW R: RO U: RO	The type of event to which this Data Reporting Provisioning Session pertains. (See clause 5.6.3.3 of TS 29.517 [5].)
dataReportingConfigurationIds	*array(ResourceId)*	0..1	C: RO R: RO U: RO	A set of identifiers for Data Reporting Configurations currently associated with this Data Reporting Provisioning Session. Always present in responses from the Data Collection AF, but may be an empty array if there is no Data Reporting Configurations currently.

6.3.2.2 DataReportingConfiguration resource type

Table 6.3.2.2-1: Definition of DataReportingConfiguration resource type

Property name	Data type	Cardinality	Usage	Description
dataReportingConfigurationId	*ResourceId*	1..1	C: RO U: –	A unique identifier for this Data Reporting Configuration assigned by the Data Collection AF when the resource is created..
dataCollectionClientType	*DataCollection ClientType*	1..1	C: RW U: –	The type of data collection client to which this Data Reporting Configuration pertains (see clause 5.4.3.1).
authorizationURL	*Url*	0..1	C: RW U: RW	A URL that may be used to authorize the consumer entity prior to a data reporting subscription.
dataSamplingRules	*array(Data SamplingRule)*	0..1	C: RW U: RW	A set of definitions (see clause 5.4.2.1), each pertaining to the domain-specific parameters associated with the Event ID of the parent Data Reporting Provisioning Session, representing instructions on how UE data is to be sampled by the data collection client. If omitted or empty, each parameter shall be sampled at its default frequency in all locations.
dataReportingConditions	*array(Data Reporting Condition)*	1..1	C: RW U: RW	A set of conditions (see clause 5.4.2.1A), each pertaining to the domain-specific parameters associated with the Event ID of the parent Data Reporting Provisioning Session, under which the data collection client reports UE data.
dataReportingRules	*array(Data ReportingRule)*	0..1	C: RW U: RW	A set of definitions (see clause 5.4.2.2), each pertaining to the domain-specific parameters associated with the Event ID of the parent Data Reporting Provisioning Session and logged by the data collection client, representing instructions on how collected UE data is to be reported by the data collection client to the Data Collection AF. If omitted or empty, UE data shall be reported whenever the relevant reporting condition (see above) is met, using a default reporting format and data packaging strategy for the data domain associated with the Event ID of the parent Data Reporting Provisioning Session.
dataAccessProfiles	*array(Data AccessProfile)*	1..1	C: RW U: RW	One or more Data Access Profile definitions, each describing a set of data processing instructions, applied by the Data Collection AF when exposing events.

6.3.2.2A DataReportingConfigurationPatch resource type

Table 6.3.2.2A-1: Definition of DataReportingConfigurationPatch resource type

Property name	Data type	Cardinality	Usage	Description
authorizationURL	*Url*	0..1	C: RW U: RW	A URL that may be used to authorize the consumer entity prior to a data reporting subscription.
dataSamplingRules	*array(Data SamplingRule)*	0..1	C: RW U: RW	A set of definitions (see clause 5.4.2.1), each pertaining to the domain-specific parameters associated with the Event ID of the parent Data Reporting Provisioning Session, representing instructions on how UE data is to be sampled by the data collection client. If omitted or empty, each parameter shall be sampled at its default frequency in all locations.
dataReportingConditions	*array(Data Reporting Condition)*	1..1	C: RW U: RW	A set of conditions (see clause 5.4.2.1A), each pertaining to the domain-specific parameters associated with the Event ID of the parent Data Reporting Provisioning Session, under which the data collection client reports UE data.
dataReportingRules	*array(Data ReportingRule)*	0..1	C: RW U: RW	A set of definitions (see clause 5.4.2.2), each pertaining to the domain-specific parameters associated with the Event ID of the parent Data Reporting Provisioning Session and logged by the data collection client, representing instructions on how collected UE data is to be reported by the data collection client to the Data Collection AF. If omitted or empty, UE data shall be reported whenever the relevant reporting condition (see above) is met, using a default reporting format and data packaging strategy for the data domain associated with the Event ID of the parent Data Reporting Provisioning Session.
dataAccessProfiles	*array(Data AccessProfile)*	0..1	C: RW U: RW	One or more Data Access Profile definitions, each describing a set of data processing instructions, applied by the Data Collection AF when exposing events.

6.3.2.3 DataAccessProfile type

Table 6.3.2.3-1 Definition of DataAccessProfile type

Property name	Data type	Cardinality	Usage	Description
dataAccessProfileId	*string*	1..1	C: RW U: RW	A unique identifier for this Data Access Profile.
targetEventConsumer Types	*Array(Event Consumer Type)*	1..1	C:RW U:RW	The set of Event consumer types (see clause 6.3.3.1) to which this Data Access Profile is targeted. If the set is empty, this Data Access Profile applies to all types of Event consumer.
parameters	*Array(String)*	1..1	C:RW U:RW	The set of UE data parameters to be collected by the data collection client, and for which the restrictions specified by this Data Access Profile apply. The parameters are uniquely identified by a controlled vocabulary specific to the Event ID indicated by the parent Data Reporting Provisioning Session. If the set is empty, the restrictions apply to all parameters for the Event ID of the parent Data Reporting Provisioning Session.
timeAccessRestrictions	*Object*	0..1	C:RW U:RW	Configuration for access restrictions along the time dimension.
duration	*DurationSec*	1..1	C:RW U:RW	The period of time over which access is to be aggregated.
aggregationFunctions	*Array(Data Aggregation FunctionType)*	1..1	C:RW U:RW	An ordered, non-empty list of aggregation functions (see clause 6.3.3.2) applied to the event data prior to exposure to event consumers.
userAccessRestrictions	*Object*	0..1	C:RW U:RW	Configuration for access restrictions along the user dimension.
groupIds	*Array(GroupId)*	1..1	C:RW U:RW	Identifiers of the UE groups over which access is to be aggregated.
userIds	*Array(Gpsi) or Array(Supi)*	1..1	C:RW U:RW	Identifiers of the UEs comprising a group over which access is to be aggregated.
aggregationFunctions	*Array(Data Aggregation FunctionType)*	1..1	C:RW U:RW	An ordered, non-empty list of aggregation functions (see clause 6.3.3.2) applied to the event data prior to exposure to event consumers.
locationAccessRestrictions	*Object*	0..1	C:RW U:RW	Configuration for access restrictions along the location dimension
locationAreas	*Array(Location Area5G)*	1..1	C:RW U:RW	Identifiers of geographical areas over which access is to be aggregated. Event data is grouped by the location of the UE during the data collection.
aggregationFunctions	*Array(Data Aggregation FunctionType)*	1..1	C:RW U:RW	An ordered, non-empty list of aggregation functions (see clause 6.3.3.2) applied to the event data prior to exposure to event consumers.
NOTE: Data types *DurationSec*, *GroupId*, *Gpsi*, *Supi* and *LocationArea5G* are defined in TS 29.571 [13].				

6.3.3 Simple data types and enumerations

6.3.3.1 EventConsumerType enumeration

Table 6.3.3.1-1: Definition of EventConsumerType enumeration

Enumeration value	Description
NWDAF	The Network Data Analytics Function is the Event Consumer.
EVENT_CONSUMER_AF	The Event Consumer AF is the Event Consumer.
NEF	The Network Exposure Function is the Event Consumer.

6.3.3.2 DataAggregationFunctionType enumeration

Table 6.3.3.2-1 Definition of DataAggregationFunctionType enumeration

Enumeration value	Description
NONE	No aggregation is applied: all values of the UE data parameter(s) are exposed to event consumers.
COUNT	The number of observed events over the indicated time period or the indicated set of users or the indicated set of locations is exposed to event consumers.
MEAN	The mean average of the values of the UE data parameter(s) over the indicated time period or the indicated set of users or the indicated set of locations is exposed to event consumers.
MAXIMUM	The maximum observed value of the UE data parameter(s) over the indicated time period or the indicated set of users or the indicated set of locations is exposed to event consumers.
MINIMUM	The minimum observed value of the UE data parameter(s) over the indicated time period or the indicated set of users or the indicated set of locations is exposed to event consumers.
SUM	The sum of the values of the UE data parameter(s) over the indicated time period or the indicated set of users or the indicated set of locations is exposed to event consumers.

6.4 Error handling

Guidelines regarding error handling of API invocation associated with the *Ndcaf_DataReportingProvisioning* service are defined in clause 5.3.3.

6.5 Mediation by NEF

In the event that the Provisioning AF and the Data Collection AF are located in different trust domains, e.g., the former entity resides within the trusted domain and the latter entity resides outside the trusted domain (as in clause A.3 or A 4 of TS 26.531 [7]), the NEF shall be employed to mediate the interactions between them, via the *Nnef_DataReporting Provisioning* service API specified in TS 29.522 [27].

7 Ndcaf_DataReporting service

7.1 General

This clause specifies the APIs used by clients of the Data Collection AF to obtain a data collection and reporting configuration from, and then report data to, the Data Collection AF.

7.2 Resources

7.2.1 Resource structure

Figure 7.2.1-1 depicts the URL path model for the *Ndcaf_DataReporting* service.

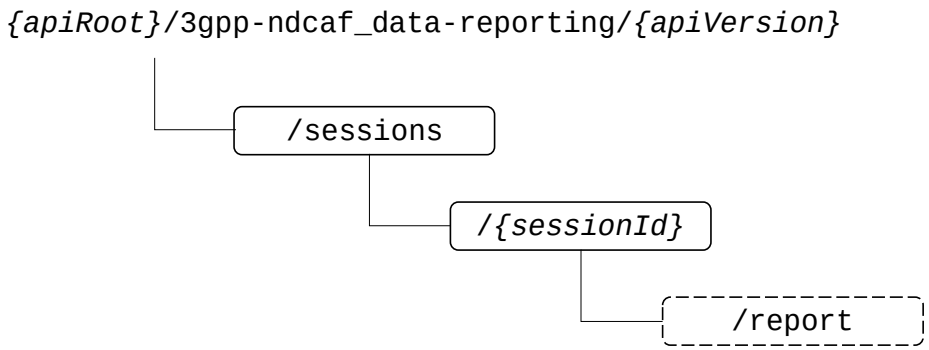

Figure 7.2.1-1: URL path model of Ndcaf_DataReporting service API

Table 7.2.1-1 provides an overview of the resources and applicable HTTP methods.

Table 7.2.1-1: Resources and methods overview

Service name	Operation name	Resource name	Resource path suffix	HTTP method or custom operation path suffix	Description
Ndcaf_DataReporting	*CreateSession*	Data Reporting Sessions	/sessions	POST	Data collection client establishes a UE data reporting session with the Data Collection AF, providing information about what UE data it can report, and is provided with a configuration in response.
	RetrieveSession	Data Reporting Session	/sessions/*{sessionId}*	GET	Retrieves a Data Reporting Session resource from the Data Collection AF.
	DestroySession			DELETE	Destroys a Data Reporting Session resource.
	Report			/report (POST)	Data collection client reports data to the Data Collection AF via the established Data Reporting Session.

7.2.2 Data Reporting Sessions resource collection

7.2.2.1 Description

The Data Reporting Sessions resource collection represents the set of all Data Collection Sessions at a given Data Collection AF (service) instance. The resource collection allows a data collection client to create a new Data Reporting Session resource at, and to receive configuration details for that session from, the Data Collection AF.

7.2.2.2 Resource definition

Resource URL: **{apiRoot}/3gpp-ndcaf_data-reporting/{apiVersion}/sessions**

This resource shall support the resource URL variables defined in table 7.2.2.2-1.

Table 7.2.2.2-1: Resource URL variables for this resource

Name	Data type	Definition
apiRoot	*string*	See clause 5.2
apiVersion	*string*	See clause 5.2.

7.2.2.3 Resource standard methods

7.2.2.3.1 Ndcaf_DataReporting_CreateSession operation using POST method

This service operation shall support the URL query parameters specified in table 7.2.2.3.1-1.

Table 7.2.2.3.1-1: URL query parameters supported by the POST method on this resource

Parameter	Data type	P	Cardinality	Description

This service operation shall support the request data structures specified in table 7.2.2.3.1-2 and the response data structures and response codes specified in table 7.2.2.3.1-4.

Table 7.2.2.3.1-2: Data structures supported by the POST request body on this resource

Data type	P	Cardinality	Description
DataReportingSession	M	1	Data supplied by the data collection client to enable creation of a new Data Reporting Session at the Data Collection AF.

Table 7.2.2.3.1-3: Headers supported for POST requests on this resource

HTTP request header	Data type	P	Cardinality	Description
`Authorization`	*string*	M	1	For authentication of the data collection client. (NOTE 1)
`Origin`	*string*	O	0..1	Indicates the origin of the requester. (NOTE 2)
NOTE 1: If OAuth 2.0 authorization is used the value is *Bearer* followed by a string representing the access token, see section 2.1 of RFC 6750 [8]. NOTE 2: The Origin header is always supplied if the data collection client is deployed in a web browser.				

Table 7.2.2.3.1-4: Data structures supported by the POST response body on this resource

Data type	P	Cardinality	Response codes	Description
DataReportingSession	M	1	201 Created	The creation of a Data Reporting Session is confirmed and configuration data for the data collection client for the session is provided by the Data Collection AF.
NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of TS 29.500 [9] also apply.				

Table 7.2.2.3.1-5: Headers supported by the *201* (*Created*) response code on this resource

HTTP response header	Data type	P	Cardinality	Description
`Location`	*string*	M	1	The URL of the newly created resource at the Data Collection AF.
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE*
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *Location*

NOTE: Standard HTTP redirection using a 3xx response code with the `Location` header as well as `Alt-Svc` are allowed.

7.2.3 Data Reporting Session resource

7.2.3.1 Description

The Data Reporting Session resource represents a single session within the collection of Data Reporting Sessions at a given Data Collection AF.

7.2.3.2 Resource definition

Resource URL: **{apiRoot}/3gpp-ndcaf_data-reporting/{apiVersion}/sessions/{sessionId}**

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

Table 7.2.3.2-1: Resource URL variables for this resource

Name	Data type	Definition
apiRoot	*string*	See clause 5.2
apiVersion	*string*	See clause 5.2.
sessionId	*string*	Identifies a Data Reporting Session at the Data Collection AF.

7.2.3.3 Resource standard methods

7.2.3.3.1 Ndcaf_DataReporting_RetrieveSession operation using GET method

This service operation shall support the URL query parameters specified in table 7.2.3.3.1-1 and the request headers specified in table 7.2.3.3.1-2.

Table 7.2.3.3.1-1: URL query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description

Table 7.2.3.3.1-2: Headers supported for GET requests on this resource

HTTP request header	Data type	P	Cardinality	Description
`Authorization`	*string*	M	1	For authentication of the data collection client. NOTE1
`Origin`	*string*	O	0..1	Indicates the origin of the requester. NOTE2
NOTE 1: If OAuth 2.0 authorization is used, the value is *Bearer* followed by a string representing the access token, see section 2.1 of RFC 6750 [8]. NOTE 2: The Origin header is always supplied if the data collection client is deployed in a Web Browser.				

This service operation shall support the response data structures and response codes specified in table 7.2.3.3.1-3.

Table 7.2.3.3.1-3: Data structures supported by the GET response body on this resource

Data type	P	Cardinality	Response codes	Description
DataReportingSession	M	1	200 OK	The requested Data Reporting Session resource is returned to the Provisioning AF by the Data Collection AF.
ProblemDetails	O	0..1	307 Temporary Redirect	Temporary redirection during a Data Reporting Session retrieval procedure. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" (Extended Support of HTTP 307/308 redirection as defined in TS 29.502 [11]) is supported.
ProblemDetails	O	0..1	308 Permanent Redirect	Permanent redirection during a Data Reporting Session retrieval procedure. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" is supported.
ProblemDetails	O	0..1	404 Not Found	This Data Reporting Session resource does not exist. (NOTE 2)
NOTE 1: The mandatory HTTP error status codes for the GET method as listed in table 5.2.7.1-1 of TS 29.500 [9] also apply. NOTE 2: Failure cases are described in clause 7.4.				

Table 7.2.3.3.1-4: Headers supported by the 200 response code on this resource

HTTP response header	Data type	P	Cardinality	Description
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE*.
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the Origin header. Valid values: *Location*.

Table 7.2.3.3.1-5: Headers supported by the 307 and 308 response codes on this resource

HTTP response header	Data type	P	Cardinality	Description
`Location`	*string*	M	1	An alternative URL of the resource located in another Data Collection AF (service) instance.
`3gpp-Sbi-Target-Nf-Id`	*string*	O	0..1	Identifier of the target NF (service) instance towards which the request is redirected
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE*
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *Location*

7.2.3.3.2 Ndcaf_DataReporting_UpdateSession operation using PUT method

The update operation is not permitted on the Data Reporting Session resource.

7.2.3.3.3 Ndcaf_DataReporting_DestroySession operation using DELETE method

This service operation shall support the URL query parameters specified in table 7.2.3.3.3-1.

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

Name	Data type	P	Cardinality	Description

This service operation shall support the request data structures and headers as specified in tables 7.2.3.3.3-2 and 7.2.3.3.3-3, respectively. Furthermore, this service operation shall support the response data structures as specified in table 7.2.3.3.3-4, and the different response codes as specified in tables 7.2.3.3.3-5 and 7.2.3.3.3-6, respectively.

Table 7.2.3.3.3-2: Data structures supported by the DELETE request body on this resource

Data type	P	Cardinality	Description

Table 7.2.3.3.3-3: Headers supported for DELETE requests on this resource

HTTP request header	Data type	P	Cardinality	Description
`Authorization`	*string*	M	1	For authentication of the data collection client. (NOTE 1)
`Origin`	*string*	O	0..1	Indicates the origin of the requester. (NOTE 2)
NOTE 1: If OAuth 2.0 authorization is used the value is *Bearer* followed by a string representing the access token, see section 2.1 of RFC 6750 [8]. NOTE 2: The Origin header is always supplied if the data collection client is deployed in a web browser.				

Table 7.2.3.3.3-4: 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 Data Reporting Session resource matching the sessionId was destroyed at the Data Collection AF.
ProblemDetails	O	0..1	307 Temporary Redirect	Temporary redirection during Data Reporting Session destruction. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" as defined in TS 29.502 [11] is supported.
ProblemDetails	O	0..1	308 Permanent Redirect	Permanent redirection during Data Reporting Session destruction. The response shall include a `Location` header field containing an alternative URL of the resource located in another Data Collection AF (service) instance. Applicable if the feature "ES3XX" is supported.
ProblemDetails	O	0..1	404 Not Found	The Data Reporting Session resource does not exist. (NOTE 2)
NOTE 1: The mandatory HTTP error status codes for the DELETE method listed in table 5.2.7.1-1 of TS 29.500 [9] also apply. NOTE 2: Failure cases are described in clause 7.4.				

Table 7.2.3.3.3-5: Headers supported by the 204 response code on this resource

HTTP response header	Data type	P	Cardinality	Description
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE.*
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *Location*.

Table 7.2.2.3.3.3-6 Headers supported by the 307 and 308 response codes on this resource

HTTP response header	Data type	P	Cardinality	Description
`Location`	*string*	M	1	An alternative URL of the resource located in another Data Collection AF (service) instance.
`3gpp-Sbi-Target-Nf-Id`	*string*	O	0..1	Identifier of the target NF (service) instance towards which the request is redirected
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10].Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *POST*, *PUT*, *DELETE*.
`Access-Control-Expose-Headers`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Valid values: *Location*.

7.2.3.4 Resource custom operations

7.2.3.4.1 Ndcaf_DataReporting_Report operation using POST method

This operation shall support the URI query parameters specified in table 7.2.3.4.1-1.

Table 7.2.3.4.1-1: URI query parameters supported by the POST method on this resource

Parameter	Data type	P	Cardinality	Description

This operation shall support the request data structures specified in table 7.2.3.4.1-2 and the request headers specified in table 7.2.3.4.1-3.

Table 7.2.3.4.1-2: Data structures supported by the POST request body

Data type	P	Cardinality	Description
DataReport	M	1	UE data reported by the data collection client.

Table 7.2.3.4.1-3: Headers supported for POST requests

HTTP request header	Data type	P	Cardinality	Description
`Authorization`	*string*	M	1	For authentication of the data collection client. (NOTE 1)
`Origin`	*string*	O	0..1	Indicates the origin of the requester. (NOTE 2)
NOTE 1: If OAuth 2.0 authorization is used the value is *Bearer* followed by a string representing the access token, see section 2.1 of RFC 6750 [8]. NOTE 2: The Origin header is always supplied if the data collection client is deployed in a web browser.				

This operation shall support the response data structures and response codes specified in table 7.2.3.4.1-4 and the response headers specified in table 7.2.3.4.1-5.

Table 7.2.3.4.1-4: Data structures supported by the POST response body

Data type	P	Cardinality	Response codes	Description
DataReportingSession	O	0..1	200 OK	The report was accepted by the Data Collection AF. A data collection client configuration (updated or unchanged) is provided in the response.
n/a			204 No Content	The report was accepted by the Data Collection AF and no content is returned in the response body.
NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of TS 29.500 [9] also apply.				

Table 7.2.3.4.1-5: Headers supported by the 200 response code

HTTP response header	Data type	P	Cardinality	Description
`Access-Control-Allow-Origin`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header.
`Access-Control-Allow-Methods`	*string*	O	0..1	Part of CORS [10]. Supplied if the request included the `Origin` header. Value: `POST`

NOTE: Standard HTTP redirection (using a 3xx response with a `Location` response header) as well as `Alt-Svc` are allowed for this method.

7.3 Data model

7.3.1 General

Table 7.3.1-1 specifies the data types used by the *Ndcaf_DataReporting* service operations.

Table 7.3.1-1: Data types used by Ndcaf_DataReporting service operations

Data type	Clause defined	Description
DataReportingSession	7.3.2.1	Configuration exposed by the Data Collection AF to a data collection client, specifying the UE data to be reported.
DataReport	7.3.2.3	A set of UE data reported by the data collection client to the Data Collection AF.

Table 7.3.1-2 specifies data types re-used from other specifications by the *Ndcaf_DataReporting* service operations, including a reference to their respective specifications.

Table 7.3.1-2: Externally defined data types used by Ndcaf_DataReporting service operations

Data type	Comments	Reference
ApplicationId	Identifies the reporting application.	TS 29.571 [12]
DateTime	A point in time, expressed as an ISO 8601 [25] date and time.	
DurationSec	A period of time, expressed in seconds.	
Double		
Float		
Int32		
Int64		
Uint16		
Uint32		
Uint64		
Uinteger		

7.3.2 Structured data types

7.3.2.1 DataReportingSession resource type

Table 7.3.2.1-1: Definition of DataReportingSession resource type

Property name	Data type	Cardinality	Usage	Description
sessionId	*string*	1..1	C: RO R: RO	Unique identifier for this Data Reporting Session assigned by the Data Collection AF.
validUntil	*DateTime*	1..1	C: RO R: RO	This property is deprecated and should be omitted. If present, it shall be ignored. HTTP cache control headers should instead be used to indicate the validity of the Data Reporting Session resource.
externalApplicationId	*ApplicationID*	1..1	C: RW R: RO	The external application identifier, nominated by the data collection client, to which this Data Reporting Session pertains.
supportedDomains	*array(DataDomain)*	1..1	C: RW R: RO	Set of domains for which the data collection client declares that it is able to report UE data. (See clause 7.3.3.1). An empty array indicates that no UE data can currently be reported.
samplingRules	*map(DataDomain -> array(DataSamplingRule))*	1..1	C: RO R: RO	A map specifying for each reporting domain listed a set of rules for sampling UE data (see clause 5.4.2.1). The indices of the map shall be a subset of the reporting domains declared by the data collection client in *supportedDomains*. If the array for a particular index in the map is empty, UE data collection shall be disabled for the indicated domain.

reportingConditions	*map(DataDomain -> array(DataReporting Condition))*	1..1	C: RO R: RO	A map specifying for each reporting domain listed the set of conditions (see clause 5.4.2.1A) under which the data collection client reports UE data. The indices of the map shall be a subset of the reporting domains declared by the data collection client in *supportedDomains*. If the array for a particular index in the map is empty, UE data reporting shall be disabled for the indicated domain.
reportingRules	*map(DataDomain -> array(DataReportingRule)*	1..1	C: RO R: RO	A map specifying for each reporting domain listed a set of rules for reporting collected UE data (see clause 5.4.2.2). The indices of the map shall be a subset of the reporting domains declared by the data collection client in *supportedDomains*. If the array for a particular index in the map is empty, UE data reporting shall be disabled for the indicated domain.

7.3.2.2 Void

7.3.2.3 DataReport type

Table 7.3.2.3-1: Definition of DataReport type

Property name	Data type	Cardinality	Description
externalApplicationId	*ApplicationID*	1	External application identifier.
expedite	*boolean*	0..1	If present and *true*, this data report contains UE data requiring expedited processing by the recipient.
serviceExperienceRecords	*array(ServiceExperienceRecord)*	0..1 (see NOTE)	See clause A.2.
locationRecords	*array(LocationRecord)*		See clause A.3.
communicationRecords	*array(CommunicationRecord)*		See clause A.4.
performanceDataRecords	*array(PerformanceDataRecord)*		See clause A.5.
applicationSpecificRecords	*array(ApplicationSpecificRecord)*		See clause A.6.
tripPlanRecords	*array(TripPlanRecord)*		See clause A.7.
mediaStreamingAccessRecords	*array(MediaStreamingAccessRecord)*		See TS 26.512 [13] clause 17.2.
aNBRNetworkAssistanceInvocation Records	*array(NetworkAssistanceInvocationRecord)*		See TS 26.512 [13] clause 17A.2.
NOTE: Exactly one of these properties must be present in a *DataReport*.			

7.3.3 Simple data types and enumerations

7.3.3.1 DataDomain enumeration

Table 7.3.3.1-1: DataDomain enumeration

Enumeration value	Description	Applicability (refer to Table 7.3.2.3-1)
SERVICE_EXPERIENCE	Service Experience data.	*serviceExperienceRecords*
LOCATION	Location data.	*locationRecords*
COMMUNICATION	Communication data.	*communicationRecords*
PERFORMANCE	Performance data.	*performanceDataRecords*
APPLICATION_SPECIFIC	Combination of QoE metrics and application service-specific data.	*applicationSpecificRecords*
MS_ANBR_NETWORK_ASSISTANCE	ANBR-based Network Assistance invocation data.	*aNBRNetworkAssistanceInvocationRecords*
MS_ACCESS_ACTIVITY	5GMS access activity data.	*mediaStreamingAccessRecords*
PLANNED_TRIPS	Data related to planned trips.	*tripPlanRecords*

7.3.3.2 Void

7.3.3.3 Void

7.4 Error handling

Guidelines regarding error handling of API invocation associated with the *Ndcaf_DataReporting* service are defined in clause 5.3.3.

7.5 Mediation by NEF

NEF mediation of data collection client access to the data collection and reporting configuration API exposed by the Data Collection AF is applicable strictly to the Indirect Data Collection Client and the AS.

- In the event that the Indirect Data Collection Client and the Data Collection AF are located in different trust domains, e.g., the former entity resides within the trusted domain and the latter entity resides outside the trusted domain (as in clause A.3 or A 4 of TS 26.531 [7]), the NEF shall be employed to mediate the interactions between them, via the *Nnef_DataReporting* service API specified in TS 29.522 [27].

- In the event that the AS and the Data Collection AF are located in different trust domains, e.g., the former entity resides within the trusted domain and the latter entity resides outside the trusted domain (as in clause A.4 of TS 26.531 [7]), the NEF shall be employed to mediate the interactions between them, via the *Nnef_Data Reporting* service API specified in TS 29.522 [27].

8 UE Data Collection, Reporting and Notification API

8.1 Overview

This clause specifies the UE Data Collection, Reporting and Notification API used by internal UE entities, namely a UE Application and the associated Direct Data Collection Client, in support of UE data collection by the Direct Data Collection Client for subsequent reporting to the Data Collection AF, and related exchange of notifications.

As noted in clause 4.3 of TS 26.531 [7] this API is not used when the Direct Data Collection Client is embedded in the UE Application (i.e., Collaboration E according to clause A.6 of [7]). However, this clause can serve as guidance to the design of the internal APIs for a UE Application with an embedded Direct Data Collection Client.

The UE architecture depicting the overall interactions between the UE Application and the Direct Data Collection Client is shown in figure 8.1-1.

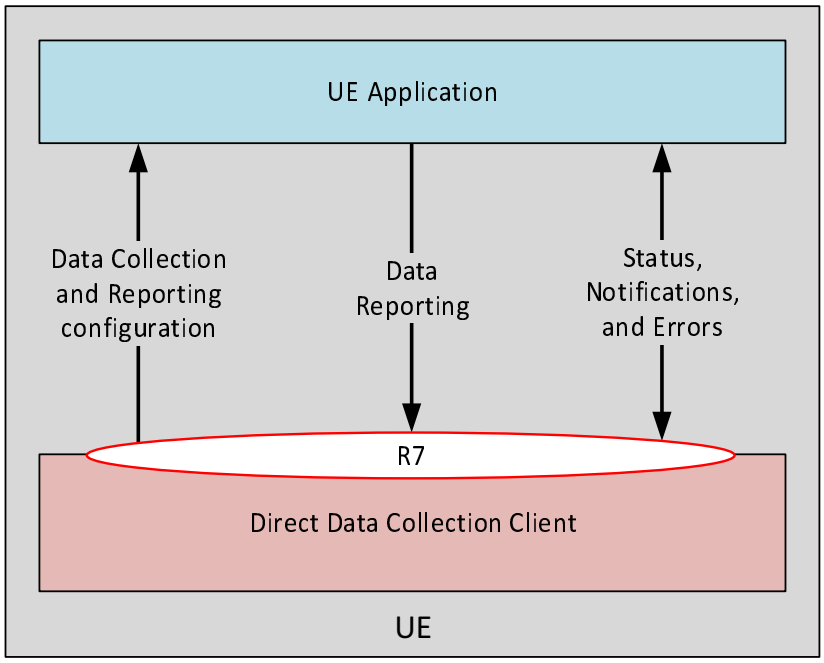

Figure 8.1-1: UE architecture for data collection, reporting and notification via R7 API

8.2 Direct Data Collection Client state model

8.2.1 Overview

Figure 8.2.1-1 represents an informative Direct Data Collection Client state model in order to properly describe the methods invoked on the R7 API. Five different states as indicated in the diagram are described in table 8.2.1-1.

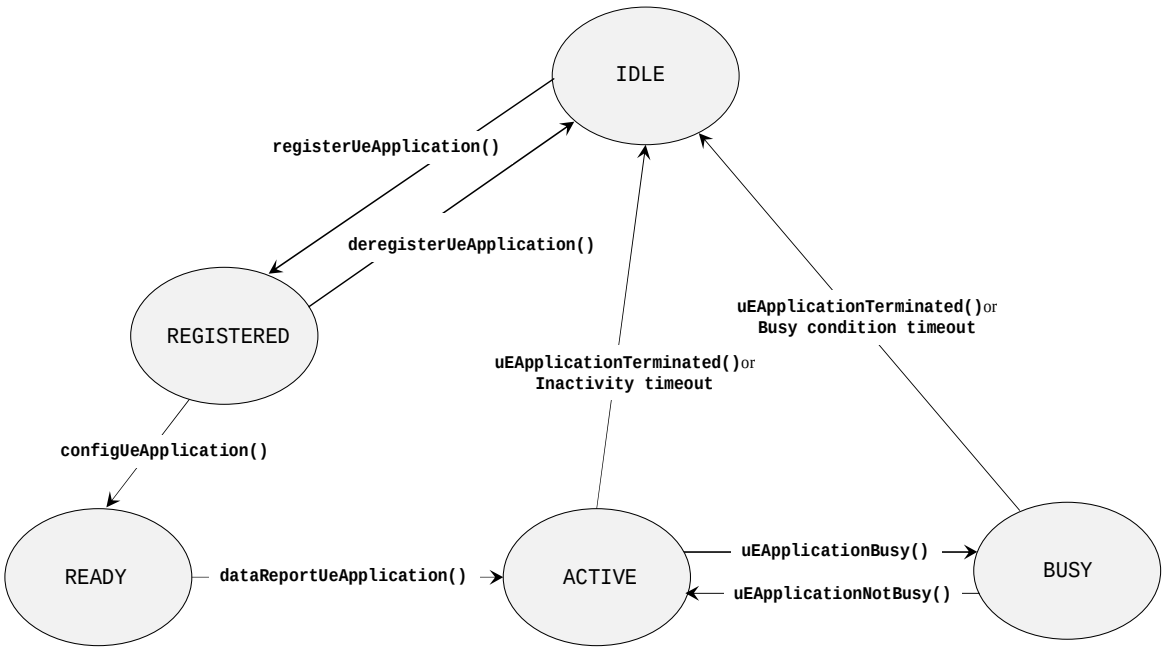

Figure 8.2.1-1: State model diagram

The depicted Direct Data Collection Client is dedicated to a corresponding UE Application and would correspond to a context-specific instance in the case where a single logical Direct Data Collection Client supports multiple UE Applications in the UE. The state model does not imply any implementation requirements for an instance of the Direct Data Collection Client, but rather is intended for use as a model to support the description of the R7 API.

State changes may occur as result of:

- Registration or deregistration of the UE Application at the Direct Data Collection Client.
- Data collection and reporting configuration request by the UE Application.
- Data report received by the Direct Data Collection Client.
- Notification received by the Direct Data Collection Client (e.g., of a busy condition at, or impending failure/crash of, the UE Application).
- Timeout at the Direct Data Collection Client due to inactivity or prolonged busy state of the UE Application.

Table 8.2.1-1 defines the states of the Direct Data Collection Client.

Table 8.2.1-1: States of Direct Data Collection Client

State	Definition
IDLE	The Direct Data Collection Client has not yet registered a UE Application, or a previous registration has been revoked due to explicit deregistration request from that UE Application, or upon receiving notification of an impending fatal error condition at the UE Application, or upon local timer expiration due to inactivity or prolonged busy state of the UE Application.
REGISTERED	The Direct Data Collection Client has received valid registration from a UE Application. Having obtained the UE data collection and reporting configuration for that UE Application, it is now ready to provide the UE data collection and reporting configuration to the UE Application.
READY	The Direct Data Collection Client has received a valid request from and returns a UE data collection and reporting configuration to, the registered UE Application.
ACTIVE	The Direct Data Collection Client has received a UE data report, or a notification from the registered UE Application that the latter has recovered from a previously busy/stalled condition and is ready to send UE data reports to the Data Collection AF.
BUSY	The Direct Data Collection Client enters this state upon having received notification that its registered UE Application is in a temporarily busy state and unable to perform UE data reporting.

8.2.2 Direct Data Collection Client internal operations

This aspect is for further study.

8.2.3 Starting and stopping the Direct Data Collection Client

The Direct Data Collection Client (instance) shall be started (i.e., transition from *IDLE* to *REGISTERED* state) upon receiving a valid registration over R7 from a UE Application. Correspondingly, the Direct Data Collection Client shall be stopped (transition to *IDLE* state from one of several possible operating states) due to occurrence of one of the corresponding conditions as described in table 8.2.1-1.

8.3 Methods

8.3.1 Overview

Table 8.3.1-1 provides an overview of the methods and notifications defined for the UE Data Collection, Reporting and Notification API at reference point R7. Different types of method are indicated, namely:

1. State change of the Direct Data Collection Client triggered by the UE Application action (registration or deregistration).
2. Request from the UE Application to the Direct Data Collection Client for a UE data collection and reporting configuration.
3. Acknowledgment and related response information returned by the Direct Data Collection Client to the UE Application for a successful UE Application registration event.
4. Data report by the UE Application to the Direct Data Collection Client according to the previously obtained configuration.
5. Notification from the UE Application to the Direct Data Collection Client.

Table 8.3.1-1: Methods invoked by the UE Application on the Direct Data Collection Client

Method name	Type	Description
registerUeApplication	State change	UE Application registers with the Direct Data Collection Client, including a callback listener for receiving event notifications.
deregisterUeApplication	State change	UE Application deregisters with the Direct Data Collection Client.
setUserConsent		UE Application grants permission for the Direct Data Reporting Client to include the GPSI when creating Data Reporting Sessions.
getDataCollectionAnd ReportingConfiguration	Configuration request	UE Application obtains its UE data collection and reporting configuration from the Direct Data Collection Client.
reportUeData	Data report	UE Application reports collected UE data to the Direct Data Collection Client according to its configuration. The UE Application may indicate (by setting a Boolean method parameter to *true*) that the data report includes UE data requiring expedited processing by the Direct Data Collection Client and, consequently, by the Data Collection AF.
resetClientReportingIdentifier		UE Application requests that the Direct Data Collection Client generates a new opaque client reporting identifier for use in data reporting until further notice. This requires any existing Data Reporting Session to be destroyed and a new one (including the replacement client reporting identifier) to be created.
uEApplicationBusy	Notification	UE Application notifies the Direct Data Collection Client that it is temporarily unable to perform UE data collection and reporting due to a busy or stalled condition.
impendingUeApplicationFailure	Notification	UE Application notifies the Direct Data Collection Client of an impending fatal error condition that will cause abrupt shutdown of the UE Application.

Table 8.3.1-2 lists the different callback notifications from the Direct Data Collection Client to the UE Application.

Table 8.3.1-2: Notifications from the Direct Data Collection Client to the UE Application

Callback notification name	Description
dataCollectionAndReporting ConfigurationChanged	Direct Data Collection Client notifies the UE Application that the data collection and reporting configuration has changed.
dataCollectionClientBusy	Direct Data Collection Client notifies the UE Application that it is temporarily unable to support UE data collection and reporting due to a busy or stalled condition.
impendingDataCollectionClientFailure	Direct Data Collection Client notifies the UE Application of an impending fatal error condition that will cause abrupt shutdown of the Direct Data Collection Client.

9 Security and Access Control

Security and access control functionality associated with UE data collection, reporting and exposure are described in other clauses of the present document, namely:

1. TLS-based authentication for HTTP/S operations associated with invocation of UE data collection, reporting and event exposure APIs is specified in clause 5.3.1.

2. Cross-Origin Resource Sharing (CORS [10]) HTTP response headers pertaining to access control.

3. Authentication or authorization by the Data Collection AF of network entities when invoking the UE data collection, reporting and event exposure APIs specified in clauses 6 and 7 including:

   a) Authentication of the Provisioning AF via use of the `Authorization` HTTP request header.

   b) Authorization of resource access requests using OAuth 2.0 [8] access tokens.

   c) Use of the *authorizationURL* property of the *DataReportingConfiguration* resource for authorizing subscription requests by consumer entities to event exposure services.

4. Provisioning AF specification of Data Access Profiles associated with the Data Reporting Configuration resource, for controlling event exposure by the Data Collection AF to different event consumer entities is specified in clause 4.2.3.3.2.

10 Data packaging strategies

10.1 General

This clause specifies data packaging strategies for each of the UE data domains defined in the present document, including a default data packaging strategy for each. When a specific data packaging strategy is provisioned in a *Data ReportingRule* (see clause 5.4.2.2) this is also included in the configuration information provided to data collection clients.

No data packaging strategies applicable to all UE data domains are specified in this release.

A default data packaging strategy applicable to all UE data domains is not specified in this release.

Data packaging strategies for the following UE data domains are not specified in the present document:

- Media streaming access activity. See clause 4.11.2 of TS 26.512 [13].
- RAN-based Network Assistance invocations. See clause 4.11A.2 of TS 26.512 [13].

10.2 Service Experience data packaging strategies

No data packaging strategies are specified in this release for the Service Experience UE data domain.

A default data packaging strategy for the Service Experience UE data domain is not specified in this release.

10.3 Location data packaging strategies

No data packaging strategies are specified in this release for the Location UE data domain.

A default data packaging strategy for the Location UE data domain is not specified in this release.

10.4 Communication data packaging strategies

No data packaging strategies are specified in this release for the Communication UE data domain.

A default data packaging strategy for the Communication UE data domain is not specified in this release.

10.5 Performance data packaging strategies

No data packaging strategies are specified in this release for the Performance UE data domain.

A default data packaging strategy for the Performance UE data domain is not specified in this release.

10.6 Application-specific data packaging strategies

No data packaging strategies are specified in this release for the Application-specific UE data domain.

A default data packaging strategy for the Application-specific UE data domain is not specified in this release.

10.7 Planned trips data packaging strategies

No data packaging strategies are specified in this release for the Planned trips UE data domain.

A default data packaging strategy for the Planned trips UE data domain is not specified in this release.

Annex A (normative): Data reporting data models

A.1 Introduction

This annex describes the format of the data reports submitted to the Data Collection AF, as required by TS 23.288 [4].

Table A.1-1 specifies data types re-used from other specifications, including a reference to their respective specifications.

Table A.1-1: Externally defined data types used by Ndcaf_DataReporting_Report operation

Data type	Comments	Reference
BitRate		3GPP TS 29.571 [12]
PacketDelBudget		
PacketLossRate		
DateTime		
DurationSec		
SvcExperience		3GPP TS 29.517 [5]
AddrFqdn		
TimeWindow		3GPP TS 29.122 [14]
Volume		
FlowInfo		
LocationArea5G		
LocationData		3GPP TS 29.572 [15]
HorizontalSpeed		

A.2 Service Experience reporting

A.2.1 ServiceExperienceRecord type

Table A.2.1-1: Definition of ServiceExperienceRecord type

Property name	Data type	Cardinality	Description
timestamp	*DateTime*	1	Time stamp of this record.
serviceExperienceInfos	*array(PerFlowServiceExperienceInfo)*	1	See clause A.2.2.

A.2.2 PerFlowServiceExperienceInfo type

Table A.2.2-1: Definition of PerFlowServiceExperienceInfo type

Property name	Data type	Cardinality	Description
serviceExperience	*SvcExperience*	1	
timeInterval	*TimeWindow*	1	
remoteEndpoint	*array(AddrFqdn)*	1	FQDN or IP Address of remote endpoint (e.g., server).

A.3 UE Location reporting

A.3.1 LocationRecord type

Table A.3.1-1: Definition of type LocationRecord

Attribute name	Data type	Cardinality	Description
timestamp	*DateTime*	1	Time stamp of this record.
location	*LocationData5G*	1	Represents the UE location.

A.4 Communication reporting

A.4.1 CommunicationRecord type

Table A.4.1-1: Definition of type CommunicationRecord

Attribute name	Data type	Cardinality	Description
timestamp	*DateTime*	1	Time stamp of this record.
timeInterval	*TimeWindow*	1	The time period over which the data volume was measured.
sliceInfo	*Snssai*	0..1	Identifying the network slice over which UE communication occurred during *timeInterval*.
dataNetworkName	*Dnn*	0..1	The name of the Data Network over which UE communication occurred during *timeInterval*.
locations	*array(LocationArea5G)*	0..1	The locations of the UE during *timeInterval*. If present, the array shall have at least one member.
uplinkVolume	*Volume*	0..1	Volume of uplink data during *timeInterval*. If this property is omitted, *downlinkVolume* shall be present.
downlinkVolume	*Volume*	0..1	Volume of downlink data during *timeInterval*. If this property is omitted, *uplinkVolume* shall be present.

A.5 Network performance Data reporting

A.5.1 PerformanceDataRecord type

Table A.5.1-1: Definition of type PerformanceDataRecord

Attribute name	Data type	Cardinality	Description
timestamp	*DateTime*	1	Time stamp of this record.
timeInterval	*TimeWindow*	1	The time period over which network performance was measured.
location	*LocationArea5G*	0..1	Represents the UE location.
remoteEndpoint	*AddrFqdn*	0..1	FQDN or IP Address of remote endpoint (e.g., server)
packetDelayBudget	*PacketDelayBudget*	0..1	Indicates average Packet Delay.
packetLossRate	*PacketLossRate*	0..1	Indicates average Packet Loss Rate.
uplinkThroughput	*BitRate*	0..1	Indicates the average uplink throughput.
downlinkThroughput	*BitRate*	0..1	Indicates the average downlink throughput.

A.6 Application-specific reporting

A.6.0 Introduction

Application-specific reporting is intended to allow reporting of any application-specific data.

A.6.1 ApplicationSpecificRecord type

Different services will have different data that are of interest (depending on the service type). The *ApplicationSpecificRecord* type is intended to enable services to report data specific for the service or application.

Table A.6.1-1: Definition of ApplicationSpecificRecord type

Property name	Data type	Cardinality	Description
timestamp	*DateTime*	1	Time stamp of this record.
recordType	*Uri*	1	A controlled term in form of a URI that uniquely identifies the type of record that follows.
recordContainer	*Object container or array container*	1	Container with the actual application-specific data.

A.7 Trip Plan reporting

A.7.0 Introduction

Trip Plan(s) enable the Data Collection AF to identify collective behavior amongst UEs. See tables 6.5.2-4 and 6.5.2-5 in 3GPP TS 23.288 [4].

A.7.1 TripPlanRecord type

Table A.7.1-1: Definition of TripPlanRecord type

Property name	Data type	Cardinality	Description
timestamp	*DateTime*	1	Time stamp of this record.
startingPoint	*LocationData*	1	The starting point of the planned trip.
waypoints	*array(LocationData)*	0..1	The route of the planned trip.
destination	*LocationData*	1	The destination of the planned trip.
estimatedAverageSpeed	*HorizontalSpeed*	0..1	Estimated average speed of the planned trip.
EstimatedArrivalTime	*DateTime*	0..1	Estimated time of arrival at the destination of the planned trip.

Annex B (normative): OpenAPI representation of REST APIs for data collection and reporting

B.1 General

This annex is based on the OpenAPI 3.0.0 specification [16] and provides corresponding representations of all APIs defined in the present document.

NOTE 1: An OpenAPIs representation embeds JSON Schema representations of HTTP message bodies.

This annex shall take precedence when being discrepant to other parts of the present document with respect to the encoding of information elements and methods within the API(s).

NOTE 2: 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.

B.2 Data types applicable to multiple services

For the purpose of referencing entities defined in this clause, it shall be assumed that the OpenAPI definitions below are contained in a physical file named "TS26532_CommonData.yaml".

```
openapi: 3.0.0
info:
  title: Data Collection and Reporting Common Data Types
  version: 2.1.0
  description: |
    Data Collection and Reporting Common Data Types
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
tags:
  - name: Data Collection and Reporting Common Data Types
    description: 'Data Collection and Reporting: Common Data Types'
externalDocs:
  description: 'TS 26.532 V18.3.0; Data Collection and Reporting; Protocols and Formats'
  url: 'https://www.3gpp.org/ftp/Specs/archive/26_series/26.532/'
paths: {}
components:
  schemas:
    ###################################
    # Clause 5.4.1: Simple data types
    ###################################

    #####################################
    # Clause 5.4.2: Structured data types
    #####################################

    DataSamplingRule:
      description: "Instructions on how UE data is to be sampled by the data collection client."
      type: object
      properties:
        contextIds:
          readOnly: true
          type: array
          minItems: 1
          items:
            type: string
            minLength: 1
        samplingPeriod:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Float'
        locationFilter:
          $ref: 'TS29122_CommonData.yaml#/components/schemas/LocationArea5G'
        required:
          - contextIds
```

```
    DataReportingCondition:
      description: "A condition that triggers data reporting by a data collection client to the
Data Collection AF."
      type: object
      properties:
        contextIds:
          readOnly: true
          type: array
          minItems: 1
          items:
            type: string
            minLength: 1
        type:
          $ref: '#/components/schemas/DataReportingConditionType'
        period:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
        parameter:
          type: string
        threshold:
          anyOf:
          - $ref: 'TS29571_CommonData.yaml#/components/schemas/Double'
          - $ref: 'TS29571_CommonData.yaml#/components/schemas/Float'
          - $ref: 'TS29571_CommonData.yaml#/components/schemas/Int32'
          - $ref: 'TS29571_CommonData.yaml#/components/schemas/Int64'
          - $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint16'
          - $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint32'
          - $ref: 'TS29571_CommonData.yaml#/components/schemas/Uint64'
          - $ref: 'TS29571_CommonData.yaml#/components/schemas/Uinteger'
        reportWhenBelow:
          type: boolean
        eventTrigger:
          $ref: '#/components/schemas/DataReportingEventTrigger'
      required:
        - contextIds
        - type

    DataReportingRule:
      description: "Instructions on how collected UE data is to be reported by the data collection
client to the Data Collection AF."
      type: object
      properties:
        contextIds:
          readOnly: true
          type: array
          minItems: 1
          items:
            type: string
            minLength: 1
        reportingProbability:
          $ref: 'TS26510_CommonData.yaml#/components/schemas/Percentage'
        reportingFormat:
          deprecated: true
          $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
        dataPackagingStrategy:
          type: string
      required:
        - contextIds

    ######################################
    # Clause 5.4.3: Enumerated data types
    ######################################

    DataCollectionClientType:
      description: "Indicating a type of data collection client that reports UE data to the Data
Collection AF."
      anyOf:
        - type: string
          enum:
            - DIRECT
            - INDIRECT
            - APPLICATION_SERVER
        - 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.

    DataReportingConditionType:
```

```
      description: "The type of condition that triggers reporting by a data collection client to
the Data Collection AF."
      anyOf:
      - type: string
        enum:
          - INTERVAL
          - THRESHOLD
          - EVENT
      - 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.

    DataReportingEventTrigger:
      description: "The type of event that triggers reporting by a data collection client to the
Data Collection AF."
      anyOf:
      - type: string
        enum:
          - LOCATION
          - DESTINATION
      - 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.
```

B.3 Ndcaf_DataReportingProvisioning service API

For the purpose of referencing entities defined in this clause, it shall be assumed that the OpenAPI definitions below are contained in a physical file named "TS26532_Ndcaf_DataReportingProvisioning.yaml".

```
openapi: 3.0.0
info:
  title: Ndcaf_DataReportingProvisioning
  version: 2.0.0
  description: |
    Data Collection AF: Provisioning Sessions API
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

tags:
  - name: Ndcaf_DataReportingProvisioning
    description: 'Data Collection and Reporting: Application Service Provider Provisioning (R1)
APIs'

externalDocs:
  description: 'TS 26.532 V18.2.0; Data Collection and Reporting; Protocols and Formats'
  url: 'https://www.3gpp.org/ftp/Specs/archive/26_series/26.532/'

servers:
  - url: '{apiRoot}/3gpp-ndcaf_data-reporting-provisioning/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: See 3GPP TS 29.532 clause 5.2.

security:
  - {}
  - oAuth2ClientCredentials: []

paths:
  /sessions:
    post:
      operationId: CreateSession
      summary: 'Create a new Data Reporting Provisioning Session'
      requestBody:
        required: true
        content:
          application/json:
            schema:
```

```
              $ref: '#/components/schemas/DataReportingProvisioningSession'
      responses:
        '201':
          description: 'Data Reporting Provisioning Session successfully created'
          headers:
            Location:
              description: 'URL including the resource identifier of the newly created Data
Reporting Provisioning Session.'
              required: true
              schema:
                $ref: 'TS26510_CommonData.yaml#/components/schemas/Url'
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DataReportingProvisioningSession'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29571_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
  /sessions/{sessionId}:
    parameters:
        - name: sessionId
          in: path
          required: true
          schema:
            $ref: 'TS26510_CommonData.yaml#/components/schemas/ResourceId'
          description: 'The resource identifier of an existing Data Reporting Provisioning
Session.'
    get:
      operationId: RetrieveSession
      summary: 'Retrieve an existing Data Reporting Provisioning Session'
      responses:
        '200':
          description: 'Representation of Data Reporting Provisioning Session is returned'
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DataReportingProvisioningSession'
        '307':
          $ref: 'TS29571_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29571_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '406':
          $ref: 'TS29571_CommonData.yaml#/components/responses/406'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
```

```
    delete:
      operationId: DestroySession
      summary: 'Destroy an existing Data Reporting Provisioning Session'
      responses:
        '204':
          description: 'Data Reporting Provisioning Session resource successfully destroyed'
          # No Content
        '307':
          $ref: 'TS29571_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29571_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
  /sessions/{sessionId}/configurations:
    parameters:
        - name: sessionId
          in: path
          required: true
          schema:
            $ref: 'TS26510_CommonData.yaml#/components/schemas/ResourceId'
          description: 'The resource identifier of an existing Data Reporting Provisioning
Session.'
    post:
      operationId: CreateConfiguration
      summary: 'Create a new Data Reporting Configuration subresource within the scope of an
existing Data Reporting Provisioning Session'
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/DataReportingConfiguration'
      responses:
        '201':
          description: 'Data Reporting Configuration successfully created'
          headers:
            Location:
              description: 'URL including the resource identifier of the newly created Data
Reporting Configuration.'
              required: true
              schema:
                $ref: 'TS26510_CommonData.yaml#/components/schemas/Url'
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DataReportingConfiguration'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29571_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
```

```
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
  /sessions/{sessionId}/configurations/{configurationId}:
    parameters:
        - name: sessionId
          in: path
          required: true
          schema:
            $ref: 'TS26510_CommonData.yaml#/components/schemas/ResourceId'
          description: 'The resource identifier of an existing Data Reporting Provisioning
Session.'
        - name: configurationId
          in: path
          required: true
          schema:
            $ref: 'TS26510_CommonData.yaml#/components/schemas/ResourceId'
          description: 'The resource identifier of an existing Data Reporting Configuration.'
    get:
      operationId: RetrieveConfiguration
      summary: 'Retrieve an existing Data Reporting Configuration'
      responses:
        '200':
          description: 'Representation of Data Reporting Configuration is returned'
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DataReportingConfiguration'
        '307':
          $ref: 'TS29571_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29571_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '406':
          $ref: 'TS29571_CommonData.yaml#/components/responses/406'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
    put:
      operationId: UpdateConfiguration
      summary: 'Replace an existing Data Reporting Configuration subresource'
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/DataReportingConfiguration'
      responses:
        '200':
          description: 'Data Reporting Configuration successfully replaced and updated resource
representation is returned'
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DataReportingConfiguration'
        '204':
          description: 'Data Reporting Configuration successfully replaced'
          # No Content.
        '307':
          $ref: 'TS29122_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29122_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
```

```
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29571_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
    patch:
      operationId: ModifyConfiguration
      summary: 'Modify an existing Data Reporting Configuration subresource'
      requestBody:
        required: true
        content:
          application/merge-patch+json:
            schema:
              $ref: '#/components/schemas/DataReportingConfigurationPatch'
      responses:
        '200':
          description: 'Data Reporting Configuration successfully replaced and updated resource
representation is returned'
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DataReportingConfiguration'
        '204':
          description: 'Data Reporting Configuration successfully replaced'
          # No Content.
        '307':
          $ref: 'TS29122_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29122_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29571_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
    delete:
      operationId: DestroyConfiguration
      summary: 'Destroy an existing Data Reporting Configuration'
      responses:
        '204':
          description: 'Data Reporting Configuration resource successfully destroyed'
          # No Content
        '307':
          $ref: 'TS29571_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29571_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
```

```
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $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: '{tokenUri}'
          scopes: {}
      description: >
        For a trusted Provisioning AF, 'ndcaf-datareportingprovisioning' shall be used
        as 'scopes' and '{nrfApiRoot}/oauth2/token' shall be used as 'tokenUri'.

  schemas:
    DataReportingProvisioningSession:
      description: "A representation of a Data Reporting Provisioning Session."
      type: object
      properties:
        provisioningSessionId:
          readOnly: true
          allOf:
            - $ref: 'TS26510_CommonData.yaml#/components/schemas/ResourceId'
        aspId:
          $ref: 'TS29514_Npcf_PolicyAuthorization.yaml#/components/schemas/AspId'
        externalApplicationId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/ApplicationId'
        internalApplicationId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/ApplicationId'
        eventId:
          $ref: 'TS29517_Naf_EventExposure.yaml#/components/schemas/AfEvent'
        dataReportingConfigurationIds:
          readOnly: true
          type: array
          items:
            $ref: 'TS26510_CommonData.yaml#/components/schemas/ResourceId'
          minItems: 0
      required:
        - provisioningSessionId
        - aspId
        - externalApplicationId
        - eventId
        - dataReportingConfigurationIds

    DataReportingConfiguration:
      description: "A Data Reporting Configuration subresource."
      type: object
      properties:
        dataReportingConfigurationId:
          readOnly: true
          allOf:
            - $ref: 'TS26510_CommonData.yaml#/components/schemas/ResourceId'
        dataCollectionClientType:
          $ref: 'TS26532_CommonData.yaml#/components/schemas/DataCollectionClientType'
        authorizationURL:
          $ref: 'TS26510_CommonData.yaml#/components/schemas/Url'
        dataSamplingRules:
          type: array
          items:
            $ref: 'TS26532_CommonData.yaml#/components/schemas/DataSamplingRule'
          minItems: 0
        dataReportingConditions:
          type: array
          items:
            $ref: 'TS26532_CommonData.yaml#/components/schemas/DataReportingCondition'
```

```
        minItems: 1
      dataReportingRules:
        type: array
        items:
          $ref: 'TS26532_CommonData.yaml#/components/schemas/DataReportingRule'
        minItems: 0
      dataAccessProfiles:
        type: array
        items:
          $ref: '#/components/schemas/DataAccessProfile'
        minItems: 1
    required:
      - dataReportingConfigurationId
      - dataCollectionClientType
      - dataReportingConditions
      - dataAccessProfiles

  DataReportingConfigurationPatch:
    description: "A JSON patch for a Data Reporting Configuration."
    type: object
    properties:
      authorizationURL:
        $ref: 'TS26510_CommonData.yaml#/components/schemas/Url'
      dataSamplingRules:
        type: array
        items:
          $ref: 'TS26532_CommonData.yaml#/components/schemas/DataSamplingRule'
        minItems: 0
      dataReportingConditions:
        type: array
        items:
          $ref: 'TS26532_CommonData.yaml#/components/schemas/DataReportingCondition'
        minItems: 1
      dataReportingRules:
        type: array
        items:
          $ref: 'TS26532_CommonData.yaml#/components/schemas/DataReportingRule'
        minItems: 0
      dataAccessProfiles:
        type: array
        items:
          $ref: '#/components/schemas/DataAccessProfile'
        minItems: 1

  DataAccessProfile:
    description: "A data access profile."
    type: object
    properties:
      dataAccessProfileId:
        type: string
      targetEventConsumerTypes:
        type: array
        items:
          $ref: '#/components/schemas/EventConsumerType'
        minItems: 0
        uniqueItems: true
      parameters:
        type: array
        items:
          type: string
        minItems: 0
        uniqueItems: true
      timeAccessRestrictions:
        type: object
        properties:
          duration:
            $ref: 'TS29571_CommonData.yaml#/components/schemas/DurationSec'
          aggregationFunctions:
            type: array
            items:
              $ref: '#/components/schemas/DataAggregationFunctionType'
            minItems: 0
            uniqueItems: true
        required:
          - duration
          - aggregationFunctions
      userAccessRestrictions:
        type: object
```

```
          properties:
            groupIds:
              type: array
              items:
                $ref: 'TS29571_CommonData.yaml#/components/schemas/GroupId'
              minItems: 0
              uniqueItems: true
            userIds:
              type: array
              items:
                anyOf:
                - $ref: 'TS29571_CommonData.yaml#/components/schemas/Gpsi'
                - $ref: 'TS29571_CommonData.yaml#/components/schemas/Supi'
                minItems: 0
                uniqueItems: true
            aggregationFunctions:
              type: array
              items:
                $ref: '#/components/schemas/DataAggregationFunctionType'
              minItems: 0
              uniqueItems: true
          required:
            - groupIds
            - userIds
            - aggregationFunctions
        locationAccessRestrictions:
          type: object
          properties:
            locationAreas:
              type: array
              items:
                $ref: 'TS29122_CommonData.yaml#/components/schemas/LocationArea5G'
              minItems: 1
              uniqueItems: true
            aggregationFunctions:
              type: array
              items:
                $ref: '#/components/schemas/DataAggregationFunctionType'
              minItems: 0
              uniqueItems: true
          required:
            - locationAreas
            - aggregationFunctions
      required:
        - dataAccessProfileId
        - targetEventConsumerTypes
        - parameters

    EventConsumerType:
      description: "The type of event consumer."
      anyOf:
      - type: string
        enum:
          - NWDAF
          - EVENT_CONSUMER_AF
          - NEF
      - 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.

    DataAggregationFunctionType:
      description: "The type of data aggregation function."
      anyOf:
      - type: string
        enum:
          - NONE
          - COUNT
          - MEAN
          - MAXIMUM
          - MINIMUM
          - SUM
      - 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.
```

B.4 Ndcaf_DataReporting service API

For the purpose of referencing entities defined in this clause, it shall be assumed that the OpenAPI definitions below are contained in a physical file named "TS26532_Ndcaf_DataReporting.yaml".

```
openapi: 3.0.0
info:
  title: Ndcaf_DataReporting
  version: 2.1.1
  description: |
    Data Collection AF: Data Collection and Reporting Configuration API and Data Reporting API
    © 2025, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

tags:
  - name: Ndcaf_DataReporting
    description: 'Data Collection and Reporting: Client Configuration and Data Reporting
(R2/R3/R4) APIs'

externalDocs:
  description: 'TS 26.532 V18.4.0; Data Collection and Reporting; Protocols and Formats'
  url: 'https://www.3gpp.org/ftp/Specs/archive/26_series/26.532/'

servers:
  - url: '{apiRoot}/3gpp-ndcaf_data-reporting/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: See 3GPP TS 29.532 clause 5.2.

security:
  - {}
  - oAuth2ClientCredentials: []

paths:
  /sessions:
    post:
      operationId: CreateSession
      summary: 'Create a new Data Reporting Session'
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/DataReportingSession'
      responses:
        '201':
          description: 'Data Reporting Session successfully created'
          headers:
            Location:
              description: 'URL including the resource identifier of the newly created Data
Reporting Session.'
              required: true
              schema:
                $ref: 'TS26510_CommonData.yaml#/components/schemas/Url'
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DataReportingSession'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29571_CommonData.yaml#/components/responses/415'
```

```
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
  /sessions/{sessionId}:
    parameters:
        - name: sessionId
          in: path
          required: true
          schema:
            $ref: 'TS26510_CommonData.yaml#/components/schemas/ResourceId'
          description: 'The resource identifier of an existing Data Reporting Session.'
    get:
      operationId: RetrieveSession
      summary: 'Retrieve an existing Data Reporting Session'
      responses:
        '200':
          description: 'Representation of Data Reporting Session is returned'
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DataReportingSession'
        '307':
          $ref: 'TS29571_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29571_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '406':
          $ref: 'TS29571_CommonData.yaml#/components/responses/406'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
    delete:
      operationId: DestroySession
      summary: 'Destroy an existing Data Reporting Session'
      responses:
        '204':
          description: 'Data Reporting Session resource successfully destroyed'
          # No Content
        '307':
          $ref: 'TS29571_CommonData.yaml#/components/responses/307'
        '308':
          $ref: 'TS29571_CommonData.yaml#/components/responses/308'
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'
  /sessions/{sessionId}/report:
    parameters:
        - name: sessionId
```

```
          in: path
          required: true
          schema:
            $ref: 'TS26510_CommonData.yaml#/components/schemas/ResourceId'
          description: 'The resource identifier of an existing Data Reporting Session.'
    post:
      operationId: Report
      summary: 'Report UE data in the context of an existing Data Reporting Session'
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/DataReport'
      responses:
        '200':
          description: 'Data Report accepted and updated Data Reporting Session is returned'
          headers:
            Location:
              description: 'URL including the resource identifier of the returned Data Reporting
Session.'
              required: true
              schema:
                $ref: 'TS26510_CommonData.yaml#/components/schemas/Url'
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/DataReportingSession'
        '204':
          description: 'Data Report accepted'
          # No Content
        '400':
          $ref: 'TS29571_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29571_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29571_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29571_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29571_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29571_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29571_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29571_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29571_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29571_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29571_CommonData.yaml#/components/responses/default'

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUri}'
          scopes: {}
      description: >
        For a trusted data collection client, 'ndcaf-datareporting' shall be used
        as 'scopes' and '{nrfApiRoot}/oauth2/token' shall be used as 'tokenUri'.

  schemas:
    DataReportingSession:
      description: "A representation of a Data Reporting Session."
      type: object
      properties:
        sessionId:
          readOnly: true
          allOf:
            - $ref: 'TS26510_CommonData.yaml#/components/schemas/ResourceId'
        validUntil:
          deprecated: true
          readOnly: true
```

```
          allOf:
            - $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        externalApplicationId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/ApplicationId'
        supportedDomains:
          type: array
          items:
            $ref: '#/components/schemas/DataDomain'
          minItems: 0
        samplingRules:
          readOnly: true
          type: object
          additionalProperties:
            type: array
            items:
              $ref: 'TS26532_CommonData.yaml#/components/schemas/DataSamplingRule'
            minItems: 0
        reportingConditions:
          readOnly: true
          type: object
          additionalProperties:
            type: array
            items:
              $ref: 'TS26532_CommonData.yaml#/components/schemas/DataReportingCondition'
            minItems: 0
        reportingRules:
          readOnly: true
          type: object
          additionalProperties:
            type: array
            items:
              $ref: 'TS26532_CommonData.yaml#/components/schemas/DataReportingRule'
            minItems: 0
      required:
        - sessionId
        - externalApplicationId
        - supportedDomains
        - samplingRules
        - reportingConditions
        - reportingRules

    DataReport:
      description: "A data report sent by a data collection client to the Data Collection AF."
      type: object
      properties:
        externalApplicationId:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/ApplicationId'
        expedite:
          type: boolean
        serviceExperienceRecords:
          type: array
          items:
            $ref: '#/components/schemas/ServiceExperienceRecord'
          minItems: 1
        locationRecords:
          type: array
          items:
            $ref: '#/components/schemas/LocationRecord'
          minItems: 1
        communicationRecords:
          type: array
          items:
            $ref: '#/components/schemas/CommunicationRecord'
          minItems: 1
        performanceDataRecords:
          type: array
          items:
            $ref: '#/components/schemas/PerformanceDataRecord'
          minItems: 1
        applicationSpecificRecords:
          type: array
          items:
            $ref: '#/components/schemas/ApplicationSpecificRecord'
          minItems: 1
        tripPlanRecords:
          type: array
          items:
            $ref: '#/components/schemas/TripPlanRecord'
```

```
          minItems: 1
        aNBRNetworkAssistanceInvocationRecords:
          type: array
          items:
            $ref:
'TS26512_R2_DataReporting.yaml#/components/schemas/ANBRNetworkAssistanceInvocationRecord'
          minItems: 1
        mediaStreamingAccessRecords:
          type: array
          items:
            $ref: 'TS26512_R4_DataReporting.yaml#/components/schemas/MediaStreamingAccessRecord'
          minItems: 1
      required:
        - externalApplicationId

    DataDomain:
      description: "A data reporting domain."
      anyOf:
      - type: string
        enum:
          - SERVICE_EXPERIENCE
          - LOCATION
          - COMMUNICATION
          - PERFORMANCE
          - APPLICATION_SPECIFIC
          - MS_ANBR_NETWORK_ASSISTANCE
          - MS_ACCESS_ACTIVITY
          - PLANNED_TRIPS
      - 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.

    BaseRecord:
      description: "Abstract base data type for UE data reporting records."
      type: object
      properties:
        timestamp:
          $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
        contextIds:
          type: array
          minItems: 1
          items:
            type: string
            minLength: 1
      required:
        - timestamp
        - contextIds

    ServiceExperienceRecord:
      description: "A data reporting record for UE service experience."
      allOf:
        - $ref: '#/components/schemas/BaseRecord'
        - type: object
          properties:
            serviceExperienceInfos:
              type: array
              items:
                $ref: '#/components/schemas/PerFlowServiceExperienceInfo'
          required:
            - serviceExperienceInfos

    PerFlowServiceExperienceInfo:
      description: "Information about the service experience of a single flow."
      type: object
      properties:
        serviceExperience:
          $ref: 'TS29517_Naf_EventExposure.yaml#/components/schemas/SvcExperience'
        timeInterval:
          $ref: 'TS29122_CommonData.yaml#/components/schemas/TimeWindow'
        remoteEndpoint:
          $ref: 'TS29517_Naf_EventExposure.yaml#/components/schemas/AddrFqdn'
      required:
        - serviceExperience
        - timeInterval
        - remoteEndpoint
```

```
    LocationRecord:
      description: "A data reporting record for UE location."
      allOf:
        - $ref: '#/components/schemas/BaseRecord'
        - type: object
          properties:
            location:
              $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/LocationData'
          required:
            - location

    CommunicationRecord:
      description: "A data reporting record for UE communication."
      allOf:
        - $ref: '#/components/schemas/BaseRecord'
        - type: object
          properties:
            timeInterval:
              $ref: 'TS29122_CommonData.yaml#/components/schemas/TimeWindow'
            sliceInfo:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/Snssai'
            dataNetworkName:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/Dnn'
            location:
              type: array
              minItems: 1
              items:
                $ref: 'TS29122_CommonData.yaml#/components/schemas/LocationArea5G'
            uplinkVolume:
              $ref: 'TS29122_CommonData.yaml#/components/schemas/Volume'
            downlinkVolume:
              $ref: 'TS29122_CommonData.yaml#/components/schemas/Volume'
          required:
            - timeInterval

    PerformanceDataRecord:
      description: "A data reporting record for UE performance."
      allOf:
        - $ref: '#/components/schemas/BaseRecord'
        - type: object
          properties:
            timeInterval:
              $ref: 'TS29122_CommonData.yaml#/components/schemas/TimeWindow'
            location:
              $ref: 'TS29122_CommonData.yaml#/components/schemas/LocationArea5G'
            remoteEndpoint:
              $ref: 'TS29517_Naf_EventExposure.yaml#/components/schemas/AddrFqdn'
            packetDelayBudget:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/PacketDelBudget'
            packetLossRate:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/PacketLossRate'
            uplinkThroughput:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/BitRate'
            downlinkThrougput:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/BitRate'
          required:
            - timeInterval

    ApplicationSpecificRecord:
      description: "A typed application-specific UE data reporting record."
      allOf:
        - $ref: '#/components/schemas/BaseRecord'
        - type: object
          properties:
            recordType:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/Uri'
            recordContainer:
              {}
              # (Syntax determined by recordType.)
          required:
            - recordType
            - recordContainer

    TripPlanRecord:
      description: "A data reporting record for UE performance."
      allOf:
        - $ref: '#/components/schemas/BaseRecord'
        - type: object
```

```
          properties:
            startingPoint:
              $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/LocationData'
            waypoints:
              type: array
              items:
                $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/LocationData'
              minItems: 1
            destination:
              $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/LocationData'
            estimatedAverageSpeed:
              $ref: 'TS29572_Nlmf_Location.yaml#/components/schemas/HorizontalSpeed'
            estimatedArrivalTime:
              $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTime'
          required:
            - startingPoint
            - destination
```

Annex C (informative): Change history

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2021-08	Sa4#115-e	S4-211220				Initial specification skeleton	0.1.0
2021-11	SA4#116-e	S4-211422 S4-211578 S4-211593				Document reorganization, and miscellaneous modifications and corrections to previous document outline. Added text under clause previously empty clause 4.2.3. Added text to previously empty clauses 4.2.4, 4.2.5, 4.2.6, 4.2.7, 4.3.2 and 4.3.3	0.2.0
2022-02	SA4#117-e	S4-220233 S4-220241 S4-220242				Additional references under clause 2, changes and added text under clause 4.2.3.3, changes and additions under clause 5.4, corrections and added text under clauses 7.2 and 7.3, new Annex A, and demoted existing Annexes A and B by one level, and added new subclause B.2.	0.3.0
2022-03	SA#95-e	SP-220248				Presentation to SA for Information	1.0.0
2022-04	SA4#118-e	S4-220536 S4-220537 S4-220538 S4-220539				Additional and corrective text to TS 26.532 V1.0.0 in accordance with agreed pCRs in S4-220536, S4-220537, S4-220538 and S4-220539.	1.1.0
2022-05	SA4#119-e	S4-220798				Merger of various changes to TS 25.532 V1.1.0 which were made after SA4#118-e in the pCR SA-220716, reviewed/agreed at SA4#119-e. Also includes further modifications in accordance with pCRs in S4-220638, S4-220716 and S4-220721, agreed at SA4#119-e, and represented by S4-220798.	1.3.0
2022-06	SA4#119-3	S4-220847				Version agreed by SA4 to be sent to the SA#96 for approval	2.0.0
2022-06	SA#96	SP-220604				Under Change Control	17.0.0
2022-07	SA#96					Editorials+Adding YAML files	17.0.1
2022-09	SA#97-e	SP-220757	0001	1	F	[EVEX] TS 26.532 PUT/PATCH corrections	17.1.0
2022-09	SA#97-e	SP-220757	0002	1	F	[EVEX] TS 26.532 Bug fixes regarding updating data collection and reporting configurations for data collection clients	17.1.0
2023-06	SA#100	SP-230745	0003	6	F	[EVEX] Data Reporting Configuration Inclusion of Data Sampling Rules and Data Reporting Rules	17.2.0
2023-09	SA#101	SP-230920	0005	1	B	[TEI18, ADAE, EVEX] UE Application instructing DDCC for immediate data report delivery	18.0.0
2023-12	SA#102	SP-231364	0004	3	B	[5GMS_Pro_Ph2] ANBR-based network assistance data reporting	18.1.0
2024-06	SA#104	SP-240697	0006	2	D	[EVEX, TEI18] HTTP reference uplift	18.2.0
2024-06	SA#104	SP-240573	0009	3	F	[EVEX, TEI18] Essential maintenance	18.2.0
2024-06	SA#104	SP-240697	0010		F	[EVEX, TEI18] Data packaging strategies	18.2.0
2024-06	SA#104	SP-240572	0011	2	F	[EVEX, TEI18] Essential corrections	18.2.0
2024-07						Fixing implementation of CR0011r2	18.2.1
2024-09	SA#105	SP-241118	0012	1	F	[EVEX, TEI18] Remove validUntil from sequence diagrams	18.3.0
2024-09	SA#105	SP-241118	0013	1	F	[EVEX, TEI18] Add context identifiers to Data Reporting data types	18.3.0
2025-03	SA#107	SP-250260	0014			Update of info and externalDocs fields	18.4.0
2025-04						Editorial correction and correction of CR0014 implementation	18.4.1

History

Document history		
V18.1.0	May 2024	Publication
V18.2.1	August 2024	Publication
V18.3.0	October 2024	Publication
V18.4.1	April 2025	Publication