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| Technical Specification | |
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# Foreword

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

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

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

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

**shall** indicates a mandatory requirement to do 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 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] OpenAPI: "OpenAPI 3.0.0 Specification", <https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md>.

# 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.

## 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

### 4.2.4 Configuration of Indirect Data Reporting Client

### 4.2.5 Configuration of Application Server

### 4.2.6 Indirect data reporting

### 4.2.7 Reporting by Application Server

### 4.2.8 Event subscription, management and publication

This clause specifies the event exposure service API used 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

### 4.3.3 Direct data reporting

## 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.

# 5 General Aspects of APIs for Data Collection and Reporting

## 5.1 Overview

## 5.2 HTTP resource URIs and paths

## 5.3 Usage of HTTP

## 5.4 Common API data types

## 5.4 Explanation of API data model notation

# 6 Ndcaf\_ReportingProvisioning service

## 6.1 General

This clause specifies the API used to provision data collection and reporting in the Data Collection AF.

## 6.2 Data collection and reporting provisioning API

### 6.2.1 Overview

This clause specifies the provisioning API used by an Application Service Provider server to provision a data collection and reporting configuration in a Data Collection AF.

### 6.2.2 Resource structure

### 6.2.3 Data Model

### 6.2.4 Mediation by NEF

# 7 Ndcaf\_Reporting 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 it, and to report data to it.

## 7.2 Data collection and reporting configuration API

### 7.2.1 Overview

This clause specifies the configuration API used by a Direct Data Collection Client, an Indirect Data Collection Client, or an Application Server to obtain a data collection and reporting configuration from the Data Collection AF.

### 7.2.2 Resource structure

### 7.2.3 Data Model

## 7.3 Data reporting API

### 7.3.1 Overview

This clause specifies the reporting API used by a Direct Data Collection Client, an Indirect Data Collection Client, or an Application Server to report UE data that has been collected to the Data Collection AF.

### 7.3.2 Resource structure

### 7.3.3 Data Model

# 8 Client API

## 8.1 General

This clause specifies the 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.

# 9 Security and Access Control

This clause specifies the security functionality associated with UE data collection, reporting and exposure.

Annex <A> (normative):  
OpenAPI representation of REST APIs for data collection and reporting

# A.1 General

This annex is based on the OpenAPI 3.0.0 specification [8] 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.

Annex <B> (informative):  
<Informative annex for a Technical Specification>

Informative annexes may appear in both Technical Specifications and Technical Reports. Use style "Heading 8" for use in TSs.

Informative annexes shall not contain requirements for the implementation of the Technical Specification.

# B.1 Heading levels in an annex

Heading levels within an annex are used as in the main document, but for Heading level selection, the "A.", "B.", etc. are ignored. e.g. **B.1.2** is formatted using ***Heading 2*** style.

Annex <X> (informative):  
Change history

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| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
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