**3GPP SA WG4#123-e**

**Online,** revision of S4-230456

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  |  | **CR** | **0005** | **rev** | **1** | **Current version:** |  |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  |  |
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| ***Source to WG:*** | , BBC, AT&T |
| ***Source to TSG:*** | S4 |
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| ***Work item code:*** | EVEX |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** |  |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | Beside indicating what data is to be collected (i.e., set of paramters) in the provisioning information specified by the ASP at reference point R1, it should be possible for the ASP to convey other information such as how that data should be collected (by format, time, location and possibly other criteria) and/or how the collected data should be reported by the data collection client to the Data Collection AF (e.g., how frequently, data packaging, by sample percentage). Doing so would match the provisioning functionality, for example, as defined in TS 26.501 and TS 26.512 regarding 3GP-DASH QoE metrics collection and reporting rules to be followed by the 5GMSd Client in the logging and reporting of QoE metrics to the 5GMSd AF. |
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| ***Summary of change:*** | * Clause 4,1: Minor wording correction, and addition of NOTE 1 regarding user consent for UE data collection, reporting and exposure, and NOTE 2 regarding compliance with regulatory requirements.
* Clause 4.3:
	+ Proposed additional contents of the provisioning information issued by the ASP to the data collection clients on how UE data should be collected and how the collected data should be reported by data collection clients at reference point R1.
	+ As consequence of the above amended provisioning information, modification on contents of the UE data to be reported by the Direct Data Collection Client at reference point R2.
	+ Addition of NOTE 0 regarding potential restrictions on provisioning of data sampling frequency and/or location filtering information due to mobile operator policy.
* Clauses 4.6.1, 4.6.2 and 4.6.3
	+ Modification of the static data model for the data collection and reporting domain in Figure 4.6.1-1 with the additional provisioning information “Data sampling rules” and “Data reporting rules”.
	+ Addition of row entries ‘Data samplig rules’ and ‘Data reporting rules’ in Tables 4.6.2.1 and 4.6.3.1.
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| ***Consequences if not approved:*** | Incorrect and incomplete specification. |
|  |  |
| ***Clauses affected:*** | 4.1, 4.3, 4.6.1, 4.6.2 and 4.6.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

FIRST CHANGE

## 4.1 General

Clause 6.2.8 of TS 23.288 [4] envisages a set of high-level procedures by which data is collected by a Network Data Analytics Function (NWDAF) from UE Application(s) via an intermediary Application Function. This clause defines a generic reference architecture for data collection, reporting and subsequent exposure that satisfies those procedures, including the logical functions involved and the logical reference points between them. The intermediary Application Function envisaged in [4] is here named the *Data Collection AF*.

NOTE 1: It is presumed that the user has granted consent for its UE data to be collected, reported and subsequently exposed by means outside the scope of the present document (e.g. through interactions with the MNO or the Application Service Provider, and via any applicable SLA between the MNO and Application Service Provider). See also the *setUserConsent* client API method specified in table 8.3.1-1 of TS 26.532 [7].

NOTE 2: The collection, reporting and exposure of location-based UE data is expected to comply with regional regulatory requirements and may be further limited by MNO policy.

It is intended that this reference architecture be instantiated in domain-specific ways to suit the needs of different features of the 5G System. The reference architecture may be instantiated separately in different slices of a network.

The services defined in the present document may be exposed to parties outside the trusted domain via the NEF, as defined in clause 4.7.1.

The Data Collection AF may support CAPIF [8] to provide APIs to other applications (i.e. API invokers), as defined in clause 4.7.2.

NEXT CHANGE

## 4.3 Reference points for data collection and reporting

The purposes of the reference points in the functional architecture defined in clause 4.2 above are as follows:

- **R1** supports the following interactions between a Provisioning AF in the Application Service Provider and the Data Collection AF:

- Used by the Application Service Provider to provision data collection and reporting in a Data Collection AF instance by means of the Ndcaf\_DataReportingProvisioning service defined in clause 4.4 of the present document (or else the equivalent service exposed by the NEF if the two functions are deployed in different trust domains). The provisioning information specifies what data is to be collected, and additionally may specify how that data is to be sampled by data collection clients (e.g., sampling frequency, location filter) and/or how the collected data is to be reported by them (e.g., reporting probability, reporting frequency, reporting format, data packaging strategy), how it is to be processed by the Data Collection AF and how it is to be exposed to event notification subscribers. A generic provisioning envelope for data collection and reporting is defined in clause 4.6 of the present document, but this is expected to be extended by individual reporting domains.

NOTE 0: Provisioning of sampling frequency and/or location filters may be limited by MNO policy, for example to limit resource impacts on the 5G System, and the Data Collection AF is expected to reject provisioning information containing out-of-policy values.

- **R2** supports the following interactions between the Direct Data Collection Client in the UE and the Data Collection AF:

- Used by a Direct Data Collection Client instance to obtain its data collection and reporting configuration from the corresponding Data Collection AF instance by means of the Ndcaf\_DataReporting service defined in clause 4.4 of the present document. The client configuration specifies what data is to be collected, and additionally specifies how that data is to be sampled (e.g., sampling frequency, location filter) and/or how the collected data is to be reported (e.g., reporting probability, reporting frequency, reporting format, data packaging strategy). A generic data collection and reporting configuration envelope is defined in clause 4.6.3 of the present document, but details of the configuration are specific to individual reporting domains and are specified elsewhere.

- Subsequently used by the Direct Data Collection Client to send reports to its Data Collection AF instance by means of the Ndcaf\_DataReporting service defined in clause 4.4 of the present document. A generic data reporting envelope is defined in clause 4.6.4 of the present document, but details of the reporting format are specific to individual reporting domains and are specified elsewhere.

NOTE 1: This method of reporting corresponds to the direct data collection procedure defined in clause 6.2.8 of TS 23.288 [4].

(SNIPPED)

NEXT CHANGE

## 4.6 Domain model

### 4.6.1 General

Figure 4.6.1‑1 depicts the static data model for the data collection and reporting domain. It is further described below.



Figure 4.6.1‑1: Static domain model

The *Provisioning AF* provisions zero or more sets of *provisioning information* in the Data Collection AF at reference point R1. The baseline set of information provisioned is described in clause 4.6.2. 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]. There may be more than one set of provisioning information for a particular external application identifier, but the combination of the external application identifier and Event ID shall be unique for a given Data Collection AF instance.

The types of data collection client that are permitted to collect UE data are indicated in *Valid targets*. *Parameters to be collected* specifies which subset of parameters associated with the UE data domain for the provisioned Event ID are to be collected by these types of data collection clients.

*Data sampling rules* specify how the domain-specific parameters associated with the Event ID are to be collected by the data collection client (e.g., sampling frequency, location filter). *Data reporting rules* specify how the data collection client is to report its collected data parameters to the Data Collection AF (e.g., reporting probability, reporting frequency, reporting format, data packaging strategy).

The *data processing instructions* and *data exposure restrictions* are expressed as a set of Data Access Profiles (see clause 4.5.2). The data exposure restrictions limit the types of event consumer that are authorised to subscribe to the Event ID provisioned for the application and the data processing instructions specify aggregation functions that are applied to UE data prior to exposure to those event consumers.

Each set of provisioning information is manifested as a *data collection client configuration* that the Data Collection AF makes available to Direct Data Collection Client instances at reference point R2, to Indirect Data Collection Client instances at R3 and to AS instances at R4.

Once configured, these data collection clients then send *data reports* to the Data Collection AF associated with the data collection client configuration. Each data report provides the external application identifier associated with the UE Application and also includes a non-empty list of *data reporting records* containing the parameters collected by the data collection client. These parameters typically include a sampling timestamp.

NOTE 1: It is the responsibility of the data collection client to discover its external application identifier by means outside the scope of the present document.

An event consumer (the NWDAF and/or Event Consumer AF) subscribes to a type of event exposed by the Data Collection AF using the procedures defined in clause 6.2.8.2.3 of TS 23.288 [4]. The event consumer may additionally specify user-, location- and/or application-based filters in its subscription request in order to further limit the events exposed to a subset of those permitted by the relevant provisioned data exposure restriction(s). Attempts by an event consumer to subscribe to event types that are not provisioned at the Data Collection AF instance are permitted, but will yield no event notifications until such event types have been successfully provisioned.

NOTE 2: It is the responsibility of the event consumer to discover the relevant application identifier of interest by means outside the scope of the present document.

Depending on the *data processing instructions* provisioned in the Data Collection AF, a data reporting record contributes to zero or more events exposed to subscribers at reference points R5 and/or R6. Conversely, an exposed event arises from one or more data reporting records. In the case of events synthesised by the Data Collection AF from multiple data reporting records, the timestamp of the event shall indicate when it was synthesised. Otherwise, the timestamp of the event shall be identical to the timestamp of the data reporting record from which it arose.

The Data Collection AF exposes a batch of recent events to consumers (the NWDAF and/or Event Consumer AF) as an *event exposure notification*.

NEXT CHANGE

### 4.6.2 Provisioning information for data collection and reporting

A separate set of provisioning information shall be provided to the Data Collection AF at reference point R1 for each Event ID it is to expose. This provisioning information embodies the Service Level Agreement between the network operator and the Application Service Provider envisaged in clause 6.2.8.1 of TS 23.288 [4]. The provisioning information shall include at least the parameters defined in table 4.6.2‑1 below:

Table 4.6.2‑1: Baseline provisioning information for data collection and reporting

|  |  |  |
| --- | --- | --- |
| Parameter | Cardinality | Description |
| External Application Identifier | 1..1 | The identifier to be used in reports sent to the Data Collection AF by data collection clients. (This needs to be mapped to the Internal Application Identifier when exposing events to the NWDAF.) |
| Internal Application Identifier | 1..1 | The identifier to be used by event consumers (including the NWDAF and the Event Consumer AF) when subscribing to events in the Data Collection AF. |
| Event ID | 1..1 | The identifier of an AF event that will be exposed to event consumers as a result of the provisioning. |
| Data collection client type | 1..1 | The type of data collection client that will submit data reports to the Data Collection AF. |
| Valid targets | 1..1 | A parameter to control whether event consumers are permitted to filter events by External UE identifier or External Group Identifier when subscribing, instead of receiving events relating to all UEs. |
| Parameters to be reported | 1..\* | The subset of domain-specific parameters associated with the specified Event ID to be reported to the Data Collection AF (subject to user consent). |
| Data sampling rules | 0..\* | Information to be forwarded by the Data Collection AF to the data collection client, representing instructions on how the subset of domain-specific parameters associated with the Event ID are to be sampled by the data collection client (e.g., sampling frequency, location filter).Default values (which may be agreed between the ASP and the MNO) shall be assumed by the Data Collection AF for any rules that are omitted. |
| Data reporting rules | 0..\* | Information to be forwarded by the Data Collection AF to the data collection client, representing instructions on how the data collection client is to report data to the Data Collection AF (e.g., reporting probability, reporting frequency, reporting format, data packaging strategy).Default values (which may be agreed) between the ASP and the MNO shall be assumed by the Data Collection AF for any rules that are omitted. |
| Data processing instructions | 1..\* | A set of operations to be performed by the Data Collection AF on the parameters reported according to clause 4.6.4 prior to exposure as an event at a particular access level.The set of supported operations shall include at least those listed in table 4.5.2‑1. |
| Data exposure restrictions | 1..\* | A set of restrictions on the exposure of the collected data after any data processing, each corresponding to a different access level. |

### 4.6.3 Configuration information for data collection clients

All clients of the Data Collection AF wishing to report data shall first obtain a data collection and reporting configuration from the Data Collection AF at reference point R2, R3 or R4 (as appropriate). For each Event ID, the data collection and reporting configuration shall include at least the parameters defined in table 4.6.3‑1 below:

Table 4.6.3‑1: Baseline information for data collection and reporting configuration

|  |  |  |
| --- | --- | --- |
| Parameter | Cardinality | Description |
| External Application Identifier | 1..1 | Identifies the UE Application to which this data collection and reporting configuration pertains.Quoted in reports sent to the Data Collection AF. |
| Parameters to be collected | 1..\* | The subset of domain-specific parameters associated with the specified Event ID to be collected by the Data Collection AF (subject to user consent). |
| Data sampling rules | 1..\* | Instructions on how the subset of domain-specific parameters associated with the Event ID are to be sampled by the data collection client (e.g., sampling frequency, location filter). |
| Data reporting rules | 1..\* | Instructions on how the data collection client is to report data to the Data Collection AF (e.g., reporting probability, reporting frequency, reporting format, data packaging strategy). |

END OF CHANGES