**3GPP TSG-WG SA2 Meeting #143E e-meeting *S2-210xxxx***

**Elbonia, February 24 – March 09, 2021 (revision of S2-210xxxx)**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **23.288** | **CR** |  | **rev** | **0** | **Current version:** | **16.6.0** |  |
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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 |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | Implementation of Enhancements on Event Exposure used by NWDAF in TS23.288 |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | SA2 |
|  |  |
| ***Work item code:*** | eNA\_Ph2 |  | ***Date:*** | 2021-02-24 |
|  |  |  |  |  |
| ***Category:*** | **<Cat>** |  | ***Release:*** | Rel-17 |
|  | *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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | Consolidation of the mechanisms to enable muting the notification of events as concluded in TR 23.700-91. |
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| ***Summary of change:*** | Introduction of the procedure for the mechanism of muting the notification of events based on the solution #37 defined in TR 23.700-91. |
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| ***Consequences if not approved:*** | Enhancements for signalling reduction via Event Exposure concluded in TR 23.700-91 are not capture in R17. |
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| ***Clauses affected:*** |  |
|  |  |
|  | **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 ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* \* First change \* \* \* \*

#### 6.2.2.5 Usage of Exposure framework by the NWDAF for Data Collection

The NWDAF shall subscribe (and unsubscribe) to the Event exposure service from NF(s) reusing the framework defined in TS 23.502 [3] clause 4.15. This framework supports the possibility for the NWDAF to indicate / request:

- Events-ID: one or multiple Event ID(s) defined in TS 23.502 [3] clause 4.15.1

- Target of Event Reporting defined in TS 23.502 [3] clause 4.15.1: the objects targeted by the Events. Within a subscription, all Event ID(s) are associated with the same target of event reporting. In the case of NWDAF, the objects can be UE(s), UE group(s), any UE.

- Event Filter Information defined in TS 23.502 [3] clause 4.15.1. This provides Event Parameter Types and Event Parameter Value(s) to be matched against.

- A Notification Target Address and a Notification Correlation ID as defined in TS 23.502 [3] clause 4.15.1, allowing the NWDAF to correlate notifications received from the NF with this subscription.

- Event Reporting Information described in TS 23.502 [3] Table 4.15.1-1 and the muted stored events exposure as described in clause 6.2.S.

- Expiry time as defined in TS 23.502 [3] clause 4.15.1.

The notifications from NFs/AFs contain on top of the Event being reported (and of dedicated information being reported for this event):

- the Notification Correlation Information provided by the NWDAF in its request,

- (when applicable to the event) the Target Id e.g. UE ID (SUPI and if available GPSI), and

- a time stamp.

\* \* \* \* Second change – ALL NEW TEXT \* \* \* \*

### 6.2.S Dedicated Procedures for Data Collection

In case of permanent data collection (e.g., during model training or for other specific use cases), additional mechanisms to limit signalling between Event Producer NF (e.g., AMF, SMF, DCCF, NWDAF) and Event Consumer NF (NWDAF, DCCF) is provided with assurances that relevant access to collected data and general trends are preserved. In order to achieve this, the Event Provider NFs are enhanced with the capability of muting the notification of the events while storing for a limited time and size the events until the Event Consumer NF retrieves such mute stored events.

#### 6.2.S.1 Procedure for Data Collection with Event Muting Mechanism

The mute storage of events in the DCCF, the distributed NWDAF, or NFs (i.e. without event reporting) can be performed during periods where no analytics are requested or for gathering data for model training of analytics IDs, within a limited size. Because of the limited size of the data collection queue, basic metrics may be performed as a complement on Event-IDs and collected information, in order to gather historical trends.

The mute storage of events mechanism reuses the Event Reporting Information field of Event Exposure Framework to include the following flags:

- Deactivate notification flag: The event consumer NF includes in the subscription to an event ID the deactivation flag to indicate to the event provider NF to collect, store the requested event but halt the notification to the consumer. The number of stored events may be limited based on NF configuration; when this number is reached, the NF continues to store new events and deletes the oldest events.

- Activate notification flag: The event consumer NF includes in an event subscription modification request the subscription identification and the activate flag to indicate to the event producer NF to send the past collected events not already sent to this consumer NF. After sending the past collected events the event producer continues to store events without sending notifications to the event consumer.

Using the event muting mechanism NWDAF, DCCF can subscribe to events from NFs such as AMF and SMF, other NWDAFs, or DCCF to avoid constant notifications and retrieve the mute stored events when it requires.

The procedure in Figure 6.2.S.1 -1 is used by Event Consumer NF to control the frequency of data collection from Event Producer NFs via Event Exposure.



Figure 6.2.S.1 -1: Procedure for muting event notification

0. The Event Consumer NF, such as NWDAF or DCCF, is configured with local policies that are used to determine when the muted storage of events is triggered. Examples of local policies for NWDAF are: to allow NWDAF to prepare for future requests of analytics IDs as defined in TS 23.288 [5] clause 6.2.1), or need for having data for model training.

1. The Event Consumer NF subscribes for a (set of) Event ID(s) by invoking the Nnf\_EventExposure\_Subscribe service operation including in event reporting information the deactivate notification flag. The Event Producer NF sends a response back including the Subscription Correlation ID and an indication of successful deactivation of notifications. The Event Consumer NF may request the Event Producer NF to store data related to Event ID(s), or aggregated data related to UE(s).

2. Based on the request from Event Consumer NF, the Event Producer NF triggers a window of event collection for the Event Consumer NF subscription with the indication of "deactivate notification flag". The Event Producer NF keeps the association between the Event ID, Subscription Correlation ID (which identifies the consumer of the event), subscriber information (e.g. notification target information) and the status of the transaction between the NF and the NWDAF as "collecting events / non-notification".

3. Based on local policies, the Event Consumer NF decides when to request the muted stored events from the Event Producer NF.

4. Event Consumer NF invokes the Nnf\_EventExposure\_Subscribe service operation from the Event Producer NF including, the Event ID, the Subscription Correlation ID, and the activate notification flag. These parameters denote the identification of the transaction required by the Event Consumer NF, i.e. retrieve muted stored events for a subscribed Event ID and trigger a new time window of muted stored event generation without notification.

5. Event Producer NF based on the parameters received in the request from Event Consumer NF verifies whether there is a subscription to the requested Event ID with a deactivate notification flag. In positive case, Event Producer NF identifies and sends the past collected events muted during the period between the received activate flag and the last deactivate flag received from the Event consumer NF for the Event ID, the Subscription Correlation ID.

6. The Event Producer NF checks whether overall event reporting information (e.g. the maximum time window for the subscription of such Event ID) has expired. If yes, it does not trigger another round of event muted storage and deactivates the subscription. If not expired, the Event Producer NF trigger another time window for muted stored of produced events, sets back the deactivated notification flag for the Event ID and Subscription Correlation ID.

NOTE: Event Consumer NF shall change an existing subscription to an Event Produce NF using muted stored events into a regular notification of events by invoking Nnf\_EventExposure\_Subscribe service operation from Event Producer NF without deactivate or activate notification flags.

\* \* \* \* End of changes \* \* \* \*