**3GPP TSG CT WG3 Meeting #134C3-242270**

Changsha China, 15th April – 19th April 2024 (revision of C3-241043)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.513** | **CR** | **0543** | **rev** | **-** | **Current version:** | **18.5.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Support of updating restricted status in UDR | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | China Telecom, Ericsson, Nokia | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNA\_Ph3 | | | | |  | ***Date:*** | | | 2024-04-15 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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 can be 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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | As described in S2-2313652 (TS23.503 CR#1200), the PCF may store Restricted Status that received from the NWDAF in the UDR as AM/SM/UE policy data. It should be pointed out that the PCF can update Restricted Status at any time during AM/SM/UE policy association Establishment, Modification and Termination procedure before the PCF invokes Nudr\_DataRepository\_Unsubscribe service operation. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add NOTE to calrify the PCF stores Restricted Status in the UDR. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Misalignment with stage2 spec. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.4.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR does not impact the OpenAPI file. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**…**

**Proposed changes:**

|  |
| --- |
| **First change** |

### 5.4.3 Policy decisions based on Network Analytics

The following Analytics IDs (observed events as described in 3GPP TS 29.520 [11]) are relevant for Policy decisions: "Slice Load level information", "Service Experience", "Network Performance", "Abnormal behaviour", "UE Mobility", "UE Communication", "User Data Congestion", "Data Dispersion", "Session Management Congestion Control Experience", "DN Performance", "WLAN performance", "Redundant Transmission Experience" and "URSP enforcement".

The PCF may subscribe to these events and/or may retrieve the observed events when the information is needed.

In order for the PCF to subscribe to these events, the PCF shall act as NF Service Consumer of the NWDAF as specified in 3GPP TS 29.520 [11] behaving as follows:

- The PCF may subscribe to notifications of network analytics related to "Slice Load Level Information" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "SLICE\_LOAD\_LEVEL", the "snssais" attribute including the network slice and the "notificationMethod" attribute in "eventSubscriptions" attribute set to "THRESHOLD".

NOTE 1: PCF does not subscribe to event "NSI\_LOAD\_LEVEL" since the network slice instance of a PDU session is not available in the PCF

- If the feature "ServiceExperience" is supported as defined in TS 29.520 [11], the PCF may subscribe to notifications of network analytics related to "Service Experience" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "SERVICE\_EXPERIENCE", the "tgtUe" attribute with the identification of target UE(s) to which the subscription applies included in the "supis", "intGroupIds" or "anyUe" attribute, the "appIds" attribute with the identification of application(s) to which the subscription applies, the "ratFreqs" attribute if the feature "ServiceExperienceExt" is also supported including all the RAT types and/or all the frequencies that the NWDAF received for the application or specific RAT type(s) and/or frequencies where the UE camps and the service experience threshold value(s) for the RAT Type(s) and/or Frequency value(s).

- If the feature "NetworkPerformance" is supported as defined in TS 29.520 [11], the PCF may subscribe to notifications of network analytics related to "Network Performance" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "NETWORK\_PERFORMANCE", the "tgtUe" attribute with the identification of target UE(s) to which the subscription applies within the "intGroupIds" attribute and the "networkArea" attribute with the identification network area to which the subscription applies.

- If the feature "AbnormalBehaviour" is supported as defined in TS 29.520 [11], the PCF may subscribe to notifications of network analytics related to "Abnormal Behavior" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "ABNORMAL\_BEHAVIOUR", the "tgtUe" attribute with the identification of target UE(s) to which the subscription applies included in the "supis", "intGroupIds" or "anyUe" attribute and either the "exptAnaType" attribute with the expected analytics or the"excepRequs" attribute with a list of exception Ids with the associated thresholds. Per each Exception Id, it is possible to provide additional information as described in TS 29.520 [11]. Upon receiving Abnormal Behaviour events for the target UE(s) from the NWDAF, the PCF, based on operator policies, may store a Restricted Status for the UE(s) in the UE/AM/SM policy data of the UDR by invoking the Nudr\_DataRepository\_Update service operation as specified in TS 29.519 [12] (see "restriStatus" attribute). Based on the operator policies, network conditions, and additional reports from the NWDAF, the PCF may remove the Restricted Status for the UE(s) by invoking the Nudr\_DataRepository\_Update service operation as specified in TS 29.519 [12]. The PCF may subscribe to changes of Policy Data by invoking Nudr\_DataRepository\_Subscribe service operation as specified in TS 29.519 [12], and determine policies based on the information related to the Restricted Status that it receives from the UDR.

- If the feature "UeMobility" is supported as defined in TS 29.520 [11], the PCF may subscribe to notifications of network analytics related to "UE Mobility" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "UE\_MOBILITY", the "tgtUe" attribute with the identification of target UE(s) to which the subscription applies within the "supis" or "intGroupIds" attribute and the "networkArea" attribute with the identification network area to which the subscription applies.

- If the feature "UeCommunication" is supported as defined in TS 29.520 [11], the PCF may subscribe to notifications of network analytics related to "UE communication" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "UE\_COMMUNICATION", the "tgtUe" attribute with the identification of target UE(s) to which the subscription applies included in the "supis"or "intGroupIds" attribute and optionally the "appIds" attribute with the identification of application(s) to which the subscription applies.

- If the feature "UserDataCongestion" is supported as defined in TS 29.520 [11], the PCF may subscribe to notifications of network analytics related to "User Data Congestion" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "USER\_DATA\_CONGESTION" and the "tgtUe" attribute with the identification of the target UE to which the subscription applies included in the "supis" attribute and optionally the "networkArea", "congThresholds" attributes with the area of interests and the reporting threshold respectively. If the feature "UserDataCongestionExt" is supported, the PCF may also provide the "maxTopAppUlNbr" and/or "maxTopAppDlNbr" attributes with the requested maximum number of top applications that contribute the most to the traffic.

- If the feature "Dispersion" is supported as defined in TS 29.520 [11], the PCF may subscribe to notifications of network analytics related to "Dispersion" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "DISPERSION", the "tgtUe" attribute with the identification of target UE(s) to which the subscription applies included in the "supis", "intGroupIds" or "anyUe" attribute and the "disperType" attribute within the "disperReqs" attribute set to the applicable dispersion analytic type. Optionally, the PCF may include the "networkArea" attribute with the identification network area to which the subscription applies, the identification of the network slice(s) by "snssais" attribute and/or the dispersion analytics requirements in "disperReqs" attribute, which for the requested dispersion type may include dispersion class within "disperClass" set to "TOP\_HEAVY". If the PCF is interested in the average data rate in the network slice, the PCF may set the "disperType" attribute within the "disperReqs" attribute set to "DVDA" and it shall provide the network slice within the "snssais" attribute and the "tgtUe" attribute set to "anyUe".

- If the feature "DnPerformance" is supported as defined in TS 29.520 [11], the PCF may subscribe to notifications of network analytics related to "DN Performance" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "DN\_PERFORMANCE" and the "tgtUe" attribute with the identification of target UE(s) to which the subscription applies included in the "supis", "intGroupIds" or "anyUe" attribute and optionally the "appIds" attribute with the identification of application(s) to which the subscription applies.

- If the feature "SMCCE" is supported as defined in TS 29.520 [11], the PCF may subscribe to notifications of network analytics related to "Session Management Congestion Control Experience" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "SM\_CONGESTION" and the "tgtUe" attribute with the identification of target UE to which the subscription applies included in the "supis" attribute and the "dnns" attribute with the identification of the DNN and/or the "snssais" attribute with the identification of the network slice.

- If the feature "WlanPerformance" is supported as defined in TS 29.520 [11], the PCF may subscribe to notifications of network analytics related to "WLAN Performance" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "WLAN\_PERFORMANCE" and the "tgtUe" attribute with the identification of target UE(s) to which the subscription applies included in the "supis", "intGroupIds" or "anyUe" attribute. The PCF may provide any of "networkArea", "ssIds" or "bssIds" attributes to which the subscription applies within "wlanReqs" attribute.

- If the feature "RedundantTransmissionExp" is supported as defined in TS 29.520 [11], the PCF may subscribe to notifications of network analytics related to "Redundant Transmission Experience" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "RED\_TRANS\_EXP" and the "tgtUe" attribute with the identification of target UE(s) to which the subscription applies included in the "supis", "intGroupIds" or "anyUe" attribute. The PCF may provide the identification of network area within "networkArea" attribute, DNNs within "dnns" attribute and other requirements within "redTransReqs" attribute.

- If the feature "UrspEnforcement" is supported as defined in TS 29.520 [11], the PCF may subscribe to notifications of network analytics related to "URSP enforcement" using the Nnwdaf\_EventsSubscription\_Subscribe service operation including the "event" attribute set to "URSP ENFORCEMENT" and the "tgtUe" attribute with the identification of target UE(s) to which the subscription applies included in the "supis", "intGroupIds" or "anyUe" attribute and the "dnns" attribute with the identification of the DNN and/or the "snssais" attribute with the identification of the network slice. The PCF may include the "networkArea" attribute with the identification network area, to which the subscription applies,

When the PCF requires the events related to any of these analytics Ids immediately, it shall initiate an Nnwdaf\_AnalyticsInfo\_Request service operation towards the NWDAF. In this case, the same level of information as for the subscription to events shall be provided as query parameters in the request, that is, the required event, filter and requirement information shall be provided in the "event-id", "event-filter" and "ana-req" URI query parameters.

Upon reception of any of the events as described above either in a subscription or retrieval request, the NWDAF shall behave as described in TS 29.520 [11].

The subscribing and/or retrieving of analytics information by the PCF from the NWDAF may be triggered by:

- Requests from AF/NEF;

- AM Policy association establishment or modification request from the AMF;

- UE Policy association establishment or modification request from the AMF;

- SM Policy association establishment or modification request from the SMF;

- Notifications received from UDR or CHF on UE subscription change;

- Analytics information received.

NOTE 2: Examples of operator policies where network analytics information from NWDAF is required as inputs for policy decisions are described in clause 6.1.1.3 of 3GPP TS 23.503[4].

NOTE 3: Care needs to be taken with regards to signalling and processing load caused when requesting analytics targeting "Any UE". A PCF preferably limits the analytics requests to a smaller UE set to reduce the load.

|  |
| --- |
| **End of changes** |