**3GPP TSG-CT WG3 Meeting #137 *C3-245389***

**Hefei, CN, 14 – 18 October, 2024 (Revision of C3-245220)**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **29.513** | **CR** | **0574** | **rev** | **-** | **Current version:** | **19.0.0** |  |
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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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| M | | | | | | | | | | |
| ***Title:*** | Support of QoS monitoring based on local policies | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, Nokia | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI19, 5G\_URLLC | | | | |  | ***Date:*** | | | 2024-10-15 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19) Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | TS 23.503 Release 18 version has been updated in the last SA2 meeting to also consider both AF request & configuration options for QoS monitoring decision (CR#1330).  However, QoS monitoring flow in TS 29.513 incorrectly only considers that QoS monitoring is initiated as part of an AF request (mandatory in the flow). Moreover, it considers that the QoS monitoring report is always sent to the NEF or AF. The case where the PCF keeps the information locally is not considered. | | | | | | | | |
| ***d*** | |  | | | | | | | | |
| ***Summary of change:*** | | Clause 5.5.9 is updated to allow the PCF to initiate QoS monitoring procedure based on operator policies and to allow the report of QoS monitoring information to the PCF only. | | | | | | | | |
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| ***Consequences if not approved:*** | | Incorrect and incomplete specification. | | | | | | | | |
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| ***Clauses affected:*** | | 5.5.9 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

\*\*\* First Change \*\*\*

### 5.5.9 QoS monitoring procedure



Figure 5.5.9-1: QoS monitoring procedure

1. The AF may subscribe to or unsubscribe from the QoS monitoring notification from the PCF via the NEF. The AF may subscribe to the notification of packet delay measurements, congestion and/or data rate monitoring QoS measurements performed by the UPF and/or packet delay variation and/or round-trip time delays over two QoS flows QoS measurements performed by the PCF.

To create a subscription to the QoS monitoring information, the AF invokes the Nnef\_AFsessionWithQoS\_Create service operation to the NEF by sending the HTTP POST request to the "AS Session with Required QoS Subscriptions" resource. If the feature "ExposureToEAS" is supported, the AF may request the direct event notification from the UPF.

To modify an existing subscription to the QoS monitoring information, the AF invokes the Nnef\_AFsessionWithQoS\_Update service operation by sending the HTTP PUT or PATCH request to the "Individual AS Session with Required QoS Subscription" resource.

To remove a subscription to QoS monitoring information, the AF invokes the Nnef\_AFsessionWithQoS\_Delete service operation by sending the HTTP DELETE request to the "Individual AS Session with Required QoS Subscription" resource.

2. Upon receipt of the AF request, the NEF authorizes it.

3-4. If the PCF address is not available on the NEF based on local configuration, the NEF invokes the Nbsf\_Management\_Discovery service operation, specified in clause 8.5.4, to obtain the selected PCF ID for the ongoing PDU session identified by the individual UE address in the AF request.

5-6. The NEF forwards the AF request to the PCF.

When receiving the Nnef\_AFsessionWithQoS\_Create request in step 1, the NEF invokes the Npcf\_PolicyAuthorization\_Create service operation by sending the HTTP POST request to the "Application Sessions" resource as described in clause 5.2.2.2.2.1.

When receiving the Nnef\_AFsessionWithQoS\_Update request in step 1, the NEF invokes the Npcf\_PolicyAuthorization\_Update service operation by sending the HTTP PATCH request to the "Individual Application Session Context" resource as described in clause 5.2.2.2.2.2.

When receiving the Nnef\_AFsessionWithQoS\_Delete request in step 1, the NEF invokes the Npcf\_PolicyAuthorization\_Delete service operation by sending the HTTP POST request to the "Individual Application Session Context" resource as described in clause 5.2.2.2.2.3.

7. The NEF sends the HTTP response message to the AF correspondingly.

8. Upon receipt of the AF request or based on operator policies, the PCF invokes the Npcf\_SMPolicyControl\_UpdateNotify service operation to update the SMF with corresponding PCC rule(s) by sending the HTTP POST request to the callback URI "{notificationUri}/update" as described in clause 5.2.2.2.1.

If the AF subscribes to QoS monitoring event for packet delay, and if the feature "EnQoSMon" is supported, data rate monitoring and/or congestion information, the PCF includes the related QoS monitoring information within the corresponding PCC rule(s).

If the PCF determines that the QoS monitoring event notification shall be sent to the PCF or to the NEF via the PCF, the PCF provides the "QOS\_MONITORING" policy control request trigger if not previously provided, as specified in 3GPP TS 29.512 [9].

If the PCF determines that the QoS monitoring event notification shall be sent to the NEF directly from the SMF, the PCF includes the notification URI pointing to the NEF within the "notifyUri" attribute, the notification and the correlation id assigned by the NEF within the "notifyCorreId" attribute, as specified in 3GPP TS 29.512 [9].

When the feature "ExposureToEAS" is supported and if the PCF received from the NEF the indication of direct QoS monitoring event notification, the PCF includes the notification URI pointing to the NEF within the "notifyUri" attribute, the notification correlation id assigned by the NEF within the "notifyCorreId" attribute and the indication of direct QoS monitoring event notification within the "directNotifInd" attribute, if available, as specified in 3GPP TS 29.512 [9]. The PCF may also determine that duplicated notification is required, i.e. both direct notification to the NEF (i.e. sent from UPF) and notification to t the PCF is required, as specified in 3GPP TS 23.548 [57]. In this case, the PCF also provides the "QOS\_MONITORING" policy control request trigger if not previously provided, as specified in 3GPP TS 29.512 [9].

If the feature "EnQoSMon" is supported and/or the AF subscribes to QoS monitoring event for packet delay variation and/or round-trip time delays over two QoS flows, the PCF includes the related QoS monitoring information for packet delay measurements within the corresponding PCC rule(s), and indicates that QoS monitoring reports are targeted to the PCF by providing the "QOS\_MONITORING" policy control request trigger if not previously provided, as specified in 3GPP TS 29.512 [9].

If the PCF received the NEF indication of direct QoS monitoring event notification for the packet delay, congestion and/or data rate monitoring and the request also included packet delay variation and/or round trip delay over two QoS flows, and the PCF determines that direct notification is not feasible as the PCF has to calculate the packet delay variation and Round-Trip delay over two QoS flows based on the packet delay measurements, the PCF indicates in the response to the AF/NEF that direct notification is not possible as specified in 3GPP TS 29.514 [10].

If the PCF deduces based on AF request (e.g. AF application identifier) and/or based on local configuration, that QoS monitoring report may be required by explicit subscription via Nsmf\_EventExposure service as specified in 3GPP TS 29.508 [8], the PCF includes as part of the QoS monitoring data referred from the PCC rule, the Data Collection Application Identifier used to identify the application to be monitored.

If the AF or the PCF decides to unsubscribe from QoS monitoring event(s), the PCF removes/updates the related subscription information from the corresponding PCC rule(s) as specified in 3GPP TS 29.512 [9].

If the AF subscribes to packet delay variation and/or Round-Trip delay over two QoS flows events, the PCF includes the related packet delay monitoring information within the corresponding PCC rule(s).

If the PCF determines that the packet delay variation and/or Round-Trip delay over two QoS flows events notification shall be sent to the NEF via the PCF, the PCF provides the "QOS\_MONITORING" policy control request trigger, as specified in 3GPP TS 29.512 [9], if not previously provided.

If the "QOS\_MONITORING" event for packet delay is requested together with the "PACK\_DEL\_VAR" and/or "RT\_DELAY\_TWO\_QOS\_FLOWS" events, the PCF shall provide to the SMF the QoS monitoring policy for packet delay measurements within the corresponding PCC rule(s), and if the PCF received from the NEF the indication of direct QoS monitoring event notification and determines that duplicated notification is required, the PCF shall provide to the SMF the indication of direct notification (together with the NEF notification URI and notification correlation identifier) and the "QOS\_MONITORING" policy control request trigger if not previously provided, as specified in 3GPP TS 29.512 [9].

9. The SMF sends an HTTP 200 OK response message to the PCF.

10a. The NF service consumer of UPF events (e.g. NWDAF) may subscribe to the QoS monitoring notification from the UPF by invoking the Nsmf\_EventExposure\_Subscribe service operation if the"UPEAS" feature is supported. The application identifier and an indication on whether QoS monitoring in the default QoS flow is requested if no PCC rule is active may be provided.

10b. The SMF checks if there is an active PCC rule that includes a Data Collection Application Identifier that matches the received application identifier. If there is an active PCC rule or there is no active PCC rule but the SMF received the indication that the QoS monitoring is requested in the default QoS flow, the SMF may send an HTTP "201 Created" response. Otherwise (no PCC rule is identified and there is no indication that QoS monitoring is requested in the default QoS flow), the SMF rejects the request or accepts it indicating that QoS monitoring is postponed, as described in 3GPP TS 29.508 [8].

11. When the SMF receives the PCC rule, the SMF shall send a QoS Monitoring request to the UPF and NG-RAN as defined in 3GPP TS 29.512 [9].

When the SMF receives the indication of direct QoS monitoring event notification within the PCC rule, the SMF shall send to the UPF the request to report directly to the NEF the QoS monitoring events. When the NEF receives the QoS monitoring report from the UPF as specified in 3GPP TS 29.564 [56], the NEF invokes the Nnef\_AFsessionWithQoS\_Notify service operation as described in steps 13-14.

When the SMF receives the subscription to QoS monitoring notification in step 10a and if there is an active PCC rule for the referred application identifier, the SMF shall send to the UPF the request to report directly to the NF service consumer (e.g. NWDAF) the QoS monitoring events as specified in 3GPP TS 29.244 [59]

When the SMF receives the subscription to QoS monitoring notification in step 10a and when it receives the indication that the QoS monitoring report may be done in the default QoS flow and there is no active PCC rule, the SMF shall send an Indication of QoS Flow associated with the default QoS Rule to the UPF as specified in 3GPP TS 29.244 [59]. In this case the notification is directly sent from the UPF.

12A. In case in step 8 the PCF determines that the notification shall be sent to the PCF:

12a-12b. Upon receipt of the QoS monitoring report from the UPF, the SMF invokes the Npcf\_SMPolicyControl\_Update service operation to the PCF by sending an HTTP POST request to the "Individual SM Policy" resource. The PCF sends an HTTP POST response to the SMF.

12c-12d. Upon receipt of the QoS monitoring event notification from the SMF, the PCF checks whether the notification needs to be sent to the NEF as described in 3GPP TS 29.512 [9], clause 4.2.3.25, and in that case, the PCF invokes the Npcf\_PolicyAuthorization\_Notify service operation to forward the notification to the NEF by sending the HTTP POST request to the callback URI "{notifUri}/notify". The NEF sends an HTTP POST response to the PCF. Otherwise, these steps do not apply.

12B. In case in step 8 the PCF determines that the notification shall be sent to the NEF directly from the SMF:

12a-12b. Upon receipt of the QoS monitoring report from the UPF, the SMF invokes Nsmf\_EventExposure\_Notify service operation to forward the notification to the NEF by sending an HTTP POST request to the callback URI "{notifUri}" received in step 8. The NEF sends an HTTP POST response to the SMF.

13-14. Upon receipt of the QoS monitoring information in step 11, the NEF invokes the Nnef\_AFsessionWithQoS\_Notify service operation to forward the QoS monitoring information to the AF.

NOTE 1: For details of Nnef\_AFsessionWithQoS\_Create/Update/Delete/Notify service operations refer to 3GPP TS 29.122 [34].

NOTE 2: For details of the Npcf\_PolicyAuthorization\_Create/Update/Delete/Notify service operations refer to 3GPP TS 29.514 [10].

NOTE 3: For details of the Npcf\_SMPolicyControl\_UpdateNotify/Update service operations refer to 3GPP TS 29.512 [9].

NOTE 4: For details of the Nbsf\_Management\_Discovery service operation refer to 3GPP TS 29.521 [22].

NOTE 5: For details of the Nsmf\_EventExposure\_Subscribe and Nsmf\_EventExposure\_Notify service operations refer to 3GPP TS 29.508 [8].

\*\*\* End of Changes \*\*\*