**3GPP TSG CT WG3 Meeting #142 C3-253440**

**Goteborg, Sweden, 25 – 29 August, 2025 (Revision of C3-253xxx)**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **29.522** | **CR** | **1699** | **rev** | **-** | **Current version:** | **19.3.0** |  |
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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:***  | Support of reporting the QoS notification event with direction information |
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| ***Source to WG:*** | Huawei, Nokia |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | XRM\_Ph2 |  | ***Date:*** | 2025-08-08 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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 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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | As defined in clause 6.1.3.18 TS 23.503, if the PCF receives a direction information together with the notification from the SMF, the PCF shall also forward the direction information to the AF. This CR proposes to support the reporting of direction information together with the QoS notification control |
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| ***Summary of change:*** | Update the procedure description to support the reporting of direction information together with the QoS notification control. |
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| ***Consequences if not approved:*** | The stage 2 requirement is not supported in stage 3. |
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| ***Clauses affected:*** | 4.4.9.2.2 |
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|  | **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 any OpenAPI file. |
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| ***This CR's revision history:*** |  |

\*\*\* 1st Change \*\*\*

##### 4.4.9.2.2 Subscriptions to QoS handling and QoS Monitoring

If the "AlternativeQoS\_5G" feature is supported, the AF may include an ordered list of QoS references within the "altQosReferences" attribute and, if the "DisableUENotification\_5G" feature is also supported, an indication that the UE does not need to be informed about changes related to Alternative QoS Profiles within the "disUeNotif" attribute.

When the NEF interfaces directly with the PCF, the NEF shall transfer them to the PCF in the Npcf\_PolicyAuthorization service and subscribe to PCF event "QOS\_NOTIF" in the Npcf\_PolicyAuthorization service. When the NEF receives the notification of PCF event "QOS\_NOTIF", it shall notify the AF with:

* "QOS\_GUARANTEED" event or with "QOS\_NOT\_GUARANTEED" event, if the "ExtQoSR19" feature is supported, "QOS\_NOT\_GUARANTEED\_DL" event or "QOS\_NOT\_GUARANTEED\_UL" event, and the currently applied QoS reference if received, and to indicate whether the QoS targets for the indicated SDFs are not guaranteed or guaranteed again in the corresponding direction.

When the NEF receives the notification of PCF event "SUCCESSFUL\_RESOURCES\_ALLOCATION", it shall notify the AF the event together with the currently applied QoS reference if received.

If the feature "AltQoSProfilesSupportReport" is supported, when the NEF receives the indication from the PCF or the TSCTSF about the support of alternative QoS profiles, the NEF shall notify the AF forwarding the received indication within the "altQosNotSuppInd" attribute.

NOTE 1: Based on the operator configuration, the QoS reference identifiers received from the AF can be the same or different as the QoS reference identifiers known at the PCF. The NEF can perform a mapping for the QoS reference identifier.

If the "AltQosWithIndParams\_5G" feature is supported, the AF may include:

- an ordered list of alternative service requirements that include individual QoS parameter sets within the "altQosReqs" attribute and, if the "DisableUENotification\_5G" feature is also supported, an indication that the UE does not need to be informed about changes related to Alternative QoS Profiles within the "disUeNotif" attribute. Within the AlternativeServiceRequirementsData data structure, the AF shall include:

- a reference to the alternative individual QoS related parameter(s) included in this set within the "altQosParamSetRef" attribute; and

- at least one of the following:

- The guaranteed bandwidth in uplink within the "gbrUl" attribute and the guaranteed bandwidth in downlink within the "gbrDl" attribute;

- The requested packet delay budget within the "pdb" attribute;

- The requested packet error rate within the "per" attribute if the "ExtQoS\_5G" feature is supported;

If the "QoSMonitoring\_5G" feature as defined in clause 5.14.4 of 3GPP TS 29.122 [4] is supported, in order to support the QoS Monitoring for packet delay, the AF shall include "qosMonInfo" attribute. The AF shall also include the "directNotifInd" attribute set to true if the "ExposureToEAS" feature is supported and the direct notification is required. Within the QosMonitoringInformation data structure, the AF shall include:

1. one or more requested QoS Monitoring Parameter(s) (i.e., UL, DL and/or RTT delay) within the "reqQosMonParams"; and

2. one or more report frequency within the "repFreqs" attribute; and

3. when the "repFreqs" attribute includes the value "PERIODIC", the periodic time for reporting and, if the feature "PacketDelayFailureReport" is supported, the maximum period with no QoS measurement results reported within the "repPeriod" attribute; and

4. when the "repFreqs" attribute includes the value "EVENT\_TRIGGERED":

a. delay threshold(s) as follows:

- the delay threshold for downlink with the "repThreshDl" attribute;

- the delay threshold for uplink with the "repThreshUl" attribute; and/or

- the delay threshold for round trip with the "repThreshRp" attribute;

b. the minimum waiting time between subsequent reports within the "waitTime" attribute; and

c. if the feature "PacketDelayFailureReport", the maximum period with no QoS measurement results reported within the "repPeriod" attribute.

If the "EnQoSMon" feature is supported and QoS monitoring control is for packet delay and/or congestion and/or data rate and/or if the "EnQoSMon\_v2" feature is supported and QoS monitoring control is for available bitrate, and if the "MultiMedia" feature is supported, the request is not for multiple flows (i.e., the "multiModDatFlows" attribute is not included), the AF shall include:

- the "qosMonInfo" attribute to request QoS monitoring for packet delay as described for the "QoSMonitoring\_5G" feature, the "qosMonConReq" attribute to request QoS monitoring for congestion and/or the "qosMonDatRate" attribute to request QoS monitoring for data rate;

NOTE 2: When the feature "MultiMedia" is supported and the request is for multiple flows (i.e., the "multiModDatFlows" attribute is included) the subscription for QoS monitoring can only be indicated within the corresponding "multiModDatFlows" entry.

- if direct notification is required for the QoS measurement(s) provided in the "qosMonInfo", "qosMonConReq", "qosMonDatRate" and "avlBitRateMon" attribute(s), the "directNotifInd" attribute set to true;

- within each of the provided QosMonitoringInformation data structure(s):

1. one or more requested QoS Monitoring Parameter(s) for the concerned QoS monitoring parameter within the "reqQosMonParams" attribute;

2. one or more report frequency within the "repFreqs" attribute, if applicable;

NOTE 3: If the "reqQosMonParams" attribute indicates congestion measurement(s), the "repFreqs" attribute can only indicate "EVENT\_TRIGGERED".

3. when the "repFreqs" attribute includes the value "PERIODIC", the periodic time for reporting and the maximum period with no QoS measurement results reported within the "repPeriod" attribute; and

4. when the "repFreqs" attribute includes the value "EVENT\_TRIGGERED":

a. for QoS monitoring for data rate:

- the data rate threshold for downlink within the "repThreshDatRateDl" attribute; and/or

- the data rate threshold for uplink within the "repThreshDatRateUl" attribute;

b. for QoS monitoring for congestion information:

- the congestion threshold for downlink with the "conThreshDl" attribute; and/or

- the congestion threshold for uplink with the "conThreshUl" attribute;

c. for QoS monitoring for available bitrate:

- a list of thresholds for uplink available bitrate reporting with the "avlBitrateUlThrs" attribute; and/or

- a list of thresholds for downlink available bitrate reporting with the "avlBitrateDlThrs" attribute;

d. the minimum waiting time between subsequent reports within the "waitTime" attribute; and

e. the maximum period with no QoS measurement results reported within the "repPeriod" attribute.

- if the QoS monitoring control is for data rate, the AF may include the averaging window within the "avrgWndw" attribute.

If the "EnQoSMon" feature is supported and QoS Monitoring control is for packet delay variation at AF session level:

- the AF shall include the required Packet Delay Variation monitoring information within "pdvMon" attribute. The subscribed event is "PACK\_DELAY\_VAR" contained in the "events" attribute within the AsSessionWithQoSSubscription data type. The AF shall include within the "pdvMon" attribute:

a) the requested Packet Delay Variation parameter(s) to be measured (i.e. DL, UL and/or round trip packet delay variation) within the "reqQosMonParams" attribute;

b) one or more report frequency within the "repFreqs" attribute;

c) when the "repFreqs" attribute is set to the value "EVENT\_TRIGGERED":

- the Packet Delay Variation threshold for downlink with the "repThreshDl" attribute;

- the Packet Delay Variation threshold for uplink with the "repThreshUl" attribute; and/or

- the Packet Delay Variation threshold for round trip with the "repThreshRp" attribute;

d) when the "repFreqs" attribute is set to the value "PERIODIC", the periodic time for reporting within the "repPeriod" attribute; and

e) when the "repFreqs" attribute is set to the value "EVENT\_TRIGGERED", the minimum waiting time between subsequent reports within the "waitTime" attribute;

NOTE 4: The direct notification "directNotifInd" attribute is not applicable for "pdvMon" attribute because the PDV monitoring calculation and notification is performed by the PCF. In case "directNotifInd" attribute is provided for packet delay, data rate, and/or congestion information along with PDV monitoring, the PDV monitoring follows the specified PCF notification mechanism and other QoS monitorings request follows the direct notification mechanism, if feasible.

When the NEF receives the notification about Packet Delay Variation event notification from the PCF as defined in clause 4.2.5.26 of 3GPP TS 29.514 [7], the NEF shall notify the AF with "PACK\_DELAY\_VAR" event and include the received monitored Packet Delay Variation information within the "pdvMonReports" attribute, it may include:

a) the uplink packet delay variation measurement(s) within the "ulPdv" attribute;

b) the downlink packet delay variation measurement(s) within the "dlPdv" attribute;

c) the round trip packet delay variation measurement(s) within the "rtPdv" attribute;

NOTE 5: QoS Monitoring for the round-trip delay over two QoS flows requires the support of the "MultiMedia" feature and is subscribed at single-modal data flow(s) level. The "RT\_DELAY\_TWO\_QOS\_FLOWS" event cannot be provided within the "events" attribute.

If the NEF authorizes the AF request, the NEF may create a QoS monitoring notification correlation identifier for the AF transaction during the creation of the AF resource and may provision it together with the received QoS monitoring parameters to the PCF by invoking the Npcf\_PolicyAuthorization service as defined in 3GPP TS 29.514 [7] or, if the "TSC\_5G" feature is supported, to the TSCTSF by invoking the Ntsctsf\_QoSandTSCAssistance service as defined in 3GPP TS 29.565 [50].

If the NEF receives from the PCF the indication that direct notification is not possible for the requested QoS monitoring parameters as specified in 3GPP TS 29.514 [7], the NEF shall include in the response to the AF request the "servAuthInfo" attribute with the value "DIRECT\_NOTIF\_NOT\_POSSIBLE".

When the NEF receives the event notification for the AF transaction as defined in clause 4.2.2 of 3GPP TS 29.508 [26] or clause 4.2.5.14 of 3GPP TS 29.514 [7] or, if the "TSC\_5G" feature is supported, clause 5.3.2.5.7 of 3GPP TS 29.565 [50], or when the AF requested direct notification, as defined in clause 5.2.2.3 of 3GPP TS 29.564 [61], the NEF shall include one or more QoS monitoring reports with the delay measurement within the "qosMonReports", the data rate measurements within the "qosMonDatRateReps" and/or the congestion measurements within "qosMonConInfoReps" attribute. Within the QosMonitoringReport data structure, the NEF shall include the received monitored QoS information.

- for packet delay measurements, within "qosMonReports":

a. the uplink packet delays within the "ulDelays" attribute; and/or

b. the downlink packet delays within the "dlDelays" attribute; and/or

c. the round trip packet delays within the "rtDelays" attribute;

NOTE 6: The PCF, the SMF, the UPF or the TSCTSF report one UL, DL and/or round-trip packet delay measurement for each periodic and/or event-triggered report as described in 3GPP TS 29.514 [7], 3GPP TS 29.508 [26], 3GPP TS 29.564 [61] and 3GPP TS 29.565 [50], i.e, the NEF can include only one element within the "ulDelays", "dlDelays", and/or "rtDelays" array(s), each one with the received report from the PCF, SMF, UPF or the TSCTSF for the UL, DL and/or round trip delay(s).

- for congestion information measurements, within the "qosMonConInfoReps":

a. the uplink congestion information measurement within the "ulConInfo" attribute; and/or

b. the downlink congestion information measurement within the "dlConInfo" attribute;

- for data rate measurements, within "qosMonDatRateReps":

a. one data rate measurement for the UL within the "ulDataRate" attribute; and/or

b. one data rate measurement for the DL within the "dlDataRate" attribute; or

- if the feature "PacketDelayFailureReport" is supported, the packet delay measurement failure indicator within the "pdmf" attribute.

If the "MultiMedia" feature is supported, when the NEF receives the event notification for the AF transaction as defined in clause 4.2.2 of 3GPP TS 29.508 [26] or clause 4.2.5.14 of 3GPP TS 29.514 [7], or when the AF requested direct notification, as defined in clause 5.2.2.3 of 3GPP TS 29.564 [61], the NEF shall include the affected single-modal identification number and the corresponding flows within the "multiModFlows" attribute.

If the "QoSMonCapRepo" feature defined in clause 5.14.4 of 3GPP TS 29.122 [4] is supported:

- the AF may subscribe to the "QOS\_MON\_CAP\_REPO" event, and if the "QOS\_MON\_CAP\_REPO" event is subscribed, the AF shall include the monitoring type within the "qosMonCapRepoTypes" attribute;

- if the NEF authorizes the AF request, the NEF shall subscribe to the corresponding event at the PCF by invoking the Npcf\_PolicyAuthorization service API as defined in 3GPP TS 29.514 [7] or at the TSCTSF by invoking the Ntsctsf\_QoSandTSCAssistance service API as defined in 3GPP TS 29.565 [50].

When the NEF receives the QoS Monitoring Capability Report event notification as defined in 3GPP TS 29.514 [7] or 3GPP TS 29.565 [50], the NEF shall notify the AF including in the "qosMonCapRepos" attribute the received information.

NOTE 7: In current release of specification, the QoS Monitoring Capability report support only Packet delay and congestion and each can be active or not active independently.

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