**3GPP TSG-SA WG4 Meeting #122 *S4-230063r1***

**Athens, Greece, 20– 24 February 2023**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **26.247** | **CR** | **0179** | **rev** | **-** | **Current version:** | **17.2.0** |  |
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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 | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:*** | Corrections to RAN visible QoE configuration and reporting | | | | | | | | | |
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| ***Source to WG:*** | Lenovo | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_QoE-Core | | | | |  | ***Date:*** | | | 2023-02-23 |
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| ***Category:*** | **F** |  | | | | | ***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 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | The description of RAN visible QoE should be updated to be aligned with the latest specification of TS 27.007 and TS 38.331.  Furthermore, there is an incorrect reference to clause 10.6 on DASH quality metrics, it should be clause 10.4. | | | | | | | | |
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| ***Summary of change:*** | | 1. References to AT commands for receiving RAN visible QoE configuration (AT command +CAPPLEVMCNR) and sending RAN visible QoE report (AT command +CAPPLEVMRNR) have been added. 2. It has been clarified that in Rel-17 only "Buffer Level" and "Playout Delay for Media Startup" metrics are supported for RAN visible QoE. 3. It has been clarified that the measurement interval for "Buffer Level" metric collection follows the baseline NR QoE configuration when the reporting periodicity is not included. Otherwise, the measurement interval for "Buffer Level" metric collection is given by reporting periodicity divided by "numberOfBufferLevelEntries" as specified in TS 38.331. 4. It has been clarified that the PDU session ID(s) corresponding to the service that is subject to RAN visible QoE measurement can also be reported by the DASH client along with the RAN visible QoE report. 5. The incorrect reference to clause 10.6 on DASH quality metrics has been corrected to clause 10.4. | | | | | | | | |
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| ***Consequences if not approved:*** | | The description of RAN visible QoE remains misaligned with TS 27.007 and TS 38.331. | | | | | | | | |
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| ***Clauses affected:*** | | Annex L.1 | | | | | | | | |
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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's revision history:*** | |  | | | | | | | | |

*Start of changes*

Annex L (normative):  
QoE Measurement Collection Functionalities

# L.1 Configuration and reporting

As an alternative to configuration via MPD or OMA-DM, the QoE configuration can optionally be specified by the QoE Measurement Collection (QMC) functionality. In this case the QoE configuration is received via specific RRC [53] messages for UMTS, RRC [59] messages for LTE, and RRC messages for NR [70] over the control plane, and the QoE reporting is also sent back via RRC messages over the control plane.

If QMC is supported, the UE shall support the following QMC functionalities:

- QoE Configuration: The QoE configuration will be delivered via RRC to the UE as a container according to "Application Layer Measurement Configuration" (see [53]) for UMTS, "measConfigAppLayer" (see [59]) for LTE and “AppLayerMeasConfig” (see [70]) for NR. The container is an octet string with gzip-encoded data (see [18]) stored in network byte order . The maximum size of the container is 1000 bytes for UMTS (see [53]) and LTE (see [59]), and 8000 bytes for NR (see [70]). The container shall be uncompressed, and is then expected to conform to XML-formatted QoE configuration data according to clause L.2 in the current specification. This QoE Configuration shall be forwarded to the DASH client. The interface towards the RRC signalling is handled by the AT command +CAPPLEVMC for UMTS and LTE, and AT command +CAPPLEVMCNR for NR [61].

- QoE Metrics: QoE Metrics from the DASH client shall be XML-formatted according to clause 10.6 in the current specification. The XML data shall be compressed with gzip (see [18]) and stored in network byte order into an octet string container. The maximum size of the container is 8000 bytes for UMTS (see [53]) and LTE (see [59]). For NR [70], the maximum size is 8000 bytes if RRC segmentation is not enabled, and 144000 bytes if enabled. The container shall be delivered via RRC to the RNC according to "Application Layer Measurement Reporting" (see [53]) for UMTS, to the eNB according to "measReportAppLayer" (see [59]) for LTE, and to the gNB according to “MeasurementReportAppLayer” (see [70]) for NR. The behaviour if the compressed data is larger than the maximum container size is unspecified in this version of the specification. The interface towards the RRC signalling is handled by the AT command +CAPPLEVMR for UMTS and LTE, and AT command +CAPPLEVMRNR for NR[61].

- The UE shall also set the QMC capability "QoE Measurement Collection for streaming services" (see [53]) to TRUE for UMTS, include the QMC capability "qoe-MeasReport" (see [59]) for LTE and include the QMC capability “qoe-Streaming-MeasReport” (see [70]) for NR.

- The QoE configuration AT command +CAPPLEVMC or AT command +CAPPLEVMCNR [61] may also indicate with an Within-area Indication if the UE is inside or outside a wanted geographic area. Such an indication may arrive with or without any QoE configuration container attached. If the DASH client is informed that it is not inside the area, it shall not start any new QoE measurements even if it has received a valid QoE configuration container, but shall continue measuring for already started sessions.

- When a new session is started, the QoE reporting AT command +CAPPLEVMR or AT command +CAPPLEVMRNR [61] shall be used to send a Recording Session Indication. Such an indication does not contain any QoE report, but indicates that QoE recording has started for a session.

- When the QoE configuration is to be released, an unsolicited result code, associated with the AT command +CAPPLEVMC or AT command +CAPPLEVMCNR [61] and containing the parameter <start-stop\_reporting> set to "1" shall be sent to the DASH client as notification of a discard request. Then the DASH client shall stop collecting quality metrics and discard any already collected information [63].

For NR, the RAN visible QoE may be supported. The gNB can use RAN visible QoE configurations to instruct the UE to collect application layer measurements for network optimization.

- The RAN visible QoE configuration generated by the gNB shall be forwarded by the UE AS layer to the DASH client via AT command +CAPPLEVMCNR, including the required RAN visible QoE metrics, service type, the RRC identifier and optionally reporting periodicity. The set of RAN visible QoE metrics is a subset of the QoE metrics defined in clause 10.4. In this release of the specification, the set of RAN visible QoE metrics include "Buffer Level" and "Playout Delay for Media Startup". If the reporting periodicity for RAN visible QoE metrics is not specified, the reporting periodicity follows the baseline NR QoE configuration. The measurement interval for "Buffer Level" metric collection is given by reporting periodicity divided by "numberOfBufferLevelEntries" as specified in [70].

- Based on the RAN visible QoE configuration, the RAN visible QoE report shall be delivered to the UE AS layer via AT command +CAPPLEVMRNR and the collected metrics shall be sent to the gNB via the “MeasurementReportAppLayer” message. The PDU session ID(s) corresponding to the service that is subject to RAN visible QoE measurement can also be reported by the DASH client along with the RAN visible QoE report.

- When the RAN visible QoE measurement is deactivated by the gNB, the DASH client shall be notified to terminate and release the RAN visible QoE measurement.

NOTE: The RAN visible QoE metrics collection can be configured only if baseline NR QoE measurements are configured for the same service type. When the baseline NR QoE measurements are released, the RAN visible QoE configuration shall also be released.

The exact implementation is not specified here, but example signalling diagrams for UMTS, LTE and NR below show the QMC functionality with a hypothetical "QMC Handler" entity.



Figure L-1: Example signalling diagram for UMTS



Figure L-2: Example signalling diagram for LTE



Figure L-3: Example signalling diagram for NR

Note that the QMC Handler is only shown here as one possible implementation, and it need not be implemented as such. The corresponding QMC functionality could be built into the DASH client or into other UE entities. In this version of the specification the detailed implementation of the above functionalities is left to the UE vendor.

*End of changes*