**3GPP TSG- Meeting #**

**, , - revision of *S4aI250079***

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** | **3** | **Current version:** |  |  |
|  | | | | | | | | |
| *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 | **X** | Core Network |  |

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| ***Title:*** |  | | | | | | | | | |
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| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
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| ***Work item code:*** |  | | | | |  | ***Date:*** | | | 13 |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | RAN3 informed SA4 in S4-250492/ R3-250858 about misaligned definition of indication of communication service type for QMC for MBS in RAN3 specification (TS 38.413, TS 38.423) and SA4 specification.  The present CR provides updates to the properties and description to the @communictionServiceType. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Updates are aded to the *communicationServiceType* attribute as part of the the DASH quality reporting scheme. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | TS 26.247 not aligned with RAN specifications. QMC may measure the wrong MBS communication service type. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 10.5, L.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Rev 0 (S4-250547) was submitted to SA4#131-bis-e meeting. It was reviewed and revised accroding to comments received from the MBS SWG meetings.  Rev 1 (S4-250691) was endorsed at SA4#131-bis-e.  Rev 2 (S4aI250079) was submitted to post SA4#131-bis-e MBS SWG Telco and received further comments during the telco. | | | | | | | | |

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

## 10.5 Quality Reporting Scheme for DASH

This clause specifies a 3GP-DASH quality reporting scheme.

The quality reporting scheme is signaled using in the **Reporting** element in the **Metrics** element. The URN to be used for the **Reporting**@schemeIdUri shall be "urn:3GPP:ns:PSS:DASH:QM10".

The reporting scheme shall use the quality reporting protocol defined in clause 10.6.

The semantics and XML syntax of the scheme information for the 3GP-DASH quality reporting scheme are specified in Table 34 and Table 35, respectively.

Table 34: Semantics of Quality Reporting Scheme Information

|  |  |  |  |
| --- | --- | --- | --- |
| Element or Attribute Name | | Use | Description |
|  | @apn | O | This attribute gives the access point that should be used for sending the QoE reports. |
|  | @format | O | This field gives the requested format for the reports. Possible formats are: "uncompressed" and "gzip". |
|  | @samplepercentage | O | Percentage of the clients that should report QoE. The client uses a random number generator with the given percentage to find out if the client should report or not. |
|  | @reportingserver | M | The reporting server URL to which the reports will be sent. |
|  | @reportinginterval | O | Indicates the time(s) reports should be sent. If not present, then the client should send a report after the streaming session has ended. If present, @reportingInterval=n indicates that the client should send a report every n-th second provided that new metrics information has become available since the previous report. For each report sent, only the newly collected information since the previous report shall be reported. |
|  | **LocationFilter** | 0..1 | When present, this element indicates the geographic area(s) or location(s) where quality metric collection is requested. When not present, quality metric collection is requested regardless of the device’s location. The LocationFilter element comprises one or more instances of any combination of targeted cell-IDs, polygons and circular areas. Each cell-ID entry in LocationFilter is announced in cellList, and each polygon and circular area entry is announced in the polygonList or and circularAreaList elements, respectively. |
|  | cellList | 0..N | This element specifies a list of cells identified by E-UTRAN-CGI or CGI. |
|  | shape |  | Geographic area comprising one or more instances of polygonList and/or circularAreaList elements. |
|  | polygonList | 0..N | This element, when present, comprises a list of ‘Polygon’ shapes as defined by OMA MLP [51]. |
|  | @confLevel | O | This attribute indicates the probability in percent that the DASH client is located in the corresponding polygon area. It is defined as ‘lev\_conf’ by OMA MLP. If not present, it has default value of 60. |
|  | circularAreaList | 0..N | This element, when present, comprises a list of ‘CircularArea’ shapes as defined by OMA MLP [51]. |
|  | @confLevel | O | This attribute indicates the probability in percent that the DASH client is located in the corresponding circular area. It is defined as ‘lev\_conf’ by OMA MLP. If not present, it has default value of 60. |
|  | @**sliceScope** | O | When present, this attribute indicates a list of network slices in which the collection and reporting of QoE metrics is requested. When not present, quality metric collection is requested for all network slices. The value is a list of S-NSSAIs. |
|  | @communicationServiceType | O | When present, this attribute indicates a list of communication service type(s) for which the collection and reporting of QoE metrics is requested, and shall contain one or more of the following values:  - The value unicast refers to the common unicast communication type carrying media streaming services.  - The value mbsMulticast refers to the *MBS Multicast* *communication service*  per clause 21.1 of TS 38.300 [71].  - The value mbsBroadcast refers to the *MBS Broadcast communication service* per clause 21.1 of TS 38.300 [71].  - The value all refers to all communication service types.  When absent, quality metrics collection is requested for all communication service types. |
| Legend:  For attributes: M=Mandatory, O=Optional, CM=Conditionally Mandatory.  For elements: <minOccurs>…<maxOccurs> (N=unbounded)  Elements are bold; attributes are non-bold and preceded with an @ | | | |

Table 35: Syntax of Quality Reporting Scheme Information

|  |
| --- |
| <?xml version="1.0"?> <xs:schema targetNamespace="urn:3GPP:ns:PSS:AdaptiveHTTPStreaming:2009:qm"   attributeFormDefault="unqualified"   elementFormDefault="qualified"   xmlns:xs="http://www.w3.org/2001/XMLSchema"  xmlns:xlink="http://www.w3.org/1999/xlink"  xmlns="urn:3GPP:ns:PSS:AdaptiveHTTPStreaming:2009:qm">    <xs:annotation>  <xs:appinfo>3GPP DASH Quality Reporting</xs:appinfo>  <xs:documentation xml:lang="en">  This Schema defines the quality reporting scheme information for 3GPP DASH.  </xs:documentation>  </xs:annotation>    <xs:element name="ThreeGPQualityReporting" type="SimpleQualityReportingType"/>    <xs:complexType name="SimpleQualityReportingType">  <xs:sequence>  <xs:element name="LocationFilter" type="LocationFilterType" minOccurs="0"/>  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>  </xs:sequence>  <xs:attribute name="apn" type="xs:string" use="optional"/>  <xs:attribute name="format" type="FormatType" use="optional"/>  <xs:attribute name="samplePercentage" type="xs:double" use="optional"/>  <xs:attribute name="reportingServer" type="xs:anyURI" use="required"/>  <xs:attribute name="reportingInterval" type="xs:unsignedInt" use="optional"/>  <xs:attribute name="sliceScope" type="UnsignedIntVectorType" use="optional"/>  <xs:attribute name="communicationServiceType" type="CommunicationServiceTypeType" use="optional" />  <xs:anyAttribute namespace="##other" processContents="lax"/>  </xs:complexType>    <xs:simpleType name="FormatType">  <xs:restriction base="xs:string">  <xs:enumeration value="uncompressed" />  <xs:enumeration value="gzip" />  </xs:restriction>  </xs:simpleType>  <xs:complexType name="CommunicationServiceTypeType">   <xs:sequence>  <xs:element name="unicast" type="xs:string" minOccurs="0"/>  <xs:element name="mbsBroadcast" type="xs:string" minOccurs="0"/>  <xs:element name="mbsMulticast" type=" xs:string " minOccurs="0"/>  <xs:element name="all" type=" xs:string " minOccurs="0"/>  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>  </xs:sequence>  </xs:complexType>  <xs:complexType name="LocationFilterType">  <xs:sequence>  <xs:element name="cellID" type="xs:unsignedLong" minOccurs="0" maxOccurs="unbounded"/>  <xs:element name="shape" type="ShapeType" minOccurs="0"/>  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>  </xs:sequence>  <xs:anyAttribute namespace="##other" processContents="lax"/>  </xs:complexType>  <xs:complexType name="ShapeType">  <xs:sequence>  <xs:element name="PolygonList" type="PolygonListType" minOccurs="0"/>  <xs:element name="CircularAreaList" type="CircularAreaListType" minOccurs="0"/>  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>  </xs:sequence>  <xs:anyAttribute namespace="##other" processContents="lax"/>  </xs:complexType>  <xs:complexType name="PolygonListType">  <xs:annotation>  <xs:documentation> see [OMA MLP] </xs:documentation>  </xs:annotation>  <xs:sequence>  <xs:element name="Polygon" minOccurs="0" maxOccurs="unbounded"/>  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>  </xs:sequence>  <xs:attribute name="ConfLevel" type="xs:unsignedInt" use="optional"/>  <xs:anyAttribute namespace="##other" processContents="lax"/>  </xs:complexType>  <xs:complexType name="CircularAreaListType">  <xs:annotation>  <xs:documentation> see [OMA MLP] </xs:documentation>  </xs:annotation>  <xs:sequence>  <xs:element name="CircularArea" minOccurs="0" maxOccurs="unbounded"/>  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>  </xs:sequence>  <xs:attribute name="ConfLevel" type="xs:unsignedInt" use="optional"/>  <xs:anyAttribute namespace="##other" processContents="lax"/>  </xs:complexType>  <xs:simpleType name="UnsignedIntVectorType">  <xs:list itemType="xs:unsignedInt"/>  </xs:simpleType> </xs:schema> |

\* \* \* \* Next change \* \* \* \*

# 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 is 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 present document. 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]. In the case where QMC is enabled for streaming services delivered via the MBS communication service, the @communicationServiceType attribute in the QoE configuration (see clause 10.5) shall indicate whether the DASH client is requested to collect and report QoE metrics about content received via unicast, via MBS broadcast, via MBS multicast, or via all of these communication service types.

- QoE Metrics: QoE Metrics from the DASH client shall be XML-formatted according to clause 10.6 in the present document. 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.

- When a new session is started, the QoE reporting 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> or <start-stop\_measurement> 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 \* \* \* \*