**3GPP TSG-S4 Meeting #129*****S4-241602***

**Electronic Meeting, 19th –23rd August 2024**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **26.506** | **CR** | **0007** | **rev** |  | **Current version:** | **18.3.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | [GA4RTAR] Clarification on metrics and consumption collection and reporting procedures | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | InterDigital Comunications, BBC | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | GA4RTAR | | | | |  | ***Date:*** | | | 2024-08-19 |
|  |  | | | |  | |  | | |  |
| ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | TS 26.506 describes the QoE metrics reporting configuration retrieval details by a Media Session Handler for an RTC session. But this document does not specify the details about the list of metrics, metrics reporting, consumption reporting procedure and call flows and whether these QoE metrics apply to downlink aspects of an RTC session, uplink aspects or both. [*https://github.com/5G-MAG/Standards/issues/137*](https://github.com/5G-MAG/Standards/issues/137) | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Explained the list of metrics that needs to be collected and reported. Clarified that the proposed QoE metrics shall be reported by a Media Session Handler for the down-link media. Provided call flow for metrics reporting and media consumption procedures. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The motivation for the QoE metrics repoting and media consumption reporting features is not clearly specified in TS 26.506. Ambiguity on QoE metrics applicability for downlink media, uplink media or for both is not clearly specified. The call flows for metrics and consumption reporting are not specified. | | | | | | | | |
| ***Q*** | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.3, 4.2.4, 4.3.4, 4.5 (new), 4.6 (new), 5.1, 5.2.3 (new), 5.2.4 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | Details of consumption reporting information for RTC remains underspecified in Release 18, even after this CR is agreed, approved and applied. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

First change

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

AR Augmented Reality

EAS Edge Application Server

ECS Edge Configuration Server

EEC Edge Enabler Client

EES Edge Enabler Server

IETF Internet Engineering Task Force

ICE Interactive Connectivity Establishment

IMS IP Multimedia Subsystem

MCU Multi-point Control Unit

MNO Mobile Network Operator

MR Mixed Reality

MSH Media Session Handler

MTSI Multimedia Telephony Service for IMS

NAT Network Address Translation

RTC Real-Time Media Communication

RTT Round-Trip Time

SDP Session Description Protocol

SFU Selective Forwarding Unit

STUN Session Traversal Utilities for NAT

TURN Traversal Using Relays around NAT

W3C World Wide Web Consortium

WebRTC Web Real-Time Communication

Next change

### 4.2.4 RTC Media Session Handler (MSH)

The RTC Media Session Handler is an entity running on the UE which assists with the integration of the RTC Application. It exchanges, on behalf of the application, information about the RTC sessions with the network.

The RTC Media Session Handler receives information about a new RTC session from the RTC Application. It relays the information to the Network Support Function. It also receives events and other network information about the RTC session from the Network Support Function, which it may relay to the application.

The *metrics reporting* subfunction of the RTC Media Session Handler executes the collection of QoS and QoE metrics measurements from the RTC Access Function, and sends metrics reports to the RTC AF for the purpose of metrics analysis or to enable potential transport optimizations by the network. The metrics to be collected and reported by the RTC Media Session handler are specified in clause 4.5.

The *consumption reporting* subfunction of the RTC Media Session Handler executes the collection of media consumption information from the RTC Access Function and submits consumption reports to the RTC AF for the purpose of RTC session audit. The media consumption information to be collected and reported by the RTC Media Session handler is specified in clause 4.6.

Next Change

### 4.3.4 RTC-5: Media session handling interface

Reference point RTC-5 is used to convey configuration information from the RTC AF to the RTC Media Session Handler and is used by the RTC Media Session Handler to request media session handling support from the RTC AF for RTC sessions.

The configuration information may consist of static information such as the following:

- Recommendations for media configurations.

- Configurations of STUN and TURN server locations.

- Configuration of the QoE metrics reporting feature.

- Configuration of the media consumption reporting feature.

- Discovery information for WebRTC signalling and data channel servers and their capabilities

The support functionality includes the following:

- RTC MSH receives the configuration information.

- RTC MSH informs the RTC AF about an RTC session and its state.

- RTC MSH requests QoS allocation for a starting or modified session.

- RTC MSH receives notifications about changes to the QoS allocation for the ongoing RTC session.

- RTC MSH receives updated information about the RTC session with the RTC STUN/TURN/Signalling function, e.g. to identify a RTC session and associate it with a QoS template.

- RTC MSH collates QoE metrics received from the RTC Access Function, and submits metrics reports to the RTC AF.

- RTC MSH collates media consumption information received from the RTC Access Function and submits consumption reports to the RTC AF.

Next change

## 4.5 QoE metrics reporting for RTC

Per clause 4.3.2:

- An RTC Client shall support the collection and reporting at reference point RTC-5 of the QoE metrics defined in table 4.5‑1 for real-time media it receives from reference points RTC‑4 and RTC‑12.

- An RTC AS shall support the collection and reporting at reference point RTC-3 of the QoE metrics defined in table 4.5‑1 about the media that it receives from RTC Clients at reference point RTC-4.

These metrics are relevant for real-time media communication services over 5G System and are valid for speech, video and text media.

Table 4.5-1: QoE metrics for RTC

|  |  |
| --- | --- |
| Metric | Definition |
| Corruption duration | For a particular component of the RTC session, the gap between the time of the last good media unit received before the corruption event and the time of the first subsequent good media unit.  This metric shall report both the total corruption duration within each sampling period and the number of such corruption events that occurred within that sampling period*.* |
| Successive loss of RTP packets | The number of RTP packets lost in succession, measured separately for each received media component of the RTC session. |
| Average frame rate | The mean average media playback frame rate over a metrics sampling period, measured separately for each received media component of the RTC session.  The value is calculated as the number of frames displayed during the sampling period divided by the time duration of that sampling period. |
| Average presentation latency | For a particular component of the RTC session, the mean average of the difference between the expected presentation time of each received media unit in the sample (as described by the media codec) and the actual presentation time of that media unit.  This metric shall be reported once when its value exceeds a threshold indicated in the metrics reporting configuration and shall not be reported again until it falls below that threshold and subsequently exceeds it. |
| Sync loss duration | The time difference between value A and value B, measured separately for each received media component of the RTC session.  Value A represents the time difference between the actual presentation time of the last played media unit of a video component and the last played media unit of its corresponding speech/audio component.  Value B represents the time difference between the expected presentation time of the last played media unit of the video component and the last played media unit of its corresponding speech/audio component.  This metric shall be reported once when its value exceeds a threshold indicated in the metrics reporting configuration and shall not be reported again until it falls below that threshold and subsequently exceeds it. |
| Average application Round-Trip Time | The mean average total round-trip latency between a pair of participants in an RTC session during the metrics sampling period.  Each application Round-Trip Time sample is calculated as the RTP packet-level network Round-Trip Time (RTT) plus the additional delay due to buffering and other processing in the RTC Client and/or RTC AS. |
| Average encoded media bit rate | For each received media component of an RTC session, the total number of bits encoded for active media frames divided by the total time over which they were captured. |

Next change

## 4.6 Media consumption reporting for RTC

Per clause 4.3.2:

- An RTC Client shall support the collection and reporting at reference point RTC-5 of information about the real-time media it consumes from reference points RTC‑4 and RTC‑12.

- An RTC AS shall support the collection and reporting at reference point RTC-3 of information about the real-time media it consumes from reference point RTC‑4.

Details of the consumption reporting information to be collected and reported by the RTC Client are for further study.

Next change

## 5.1 General

The RTC procedures that are defined in this clause are classified based on the collaboration scenarios that are described in annex A. Depending on the scenario, only a subset of the functions that are defined in clause 4.2 may be involved.

In general, the RTC call flow may consist of the following procedures.

- Provisioning

- Configuration

- Discovery of ICE candidates

- Session establishment

- QoS request (either client-driven or WebRTC signalling function/server-driven)

- RTC traffic delivery

- QoS updates

- Metrics collection and reporting

- Consumption collection and reporting

- Session termination

Next change

### 5.2.3 Metrics reporting

#### 5.2.3.1 Metrics reporting by RTC Access Function

This procedure is used to provision the QoE metrics reporting feature in the RTC AF and subsequently to configure the RTC Media Session Handler of an RTC Client to collect and report QoE metrics for the real-time media it has received. The RTC Media Session Handler collates the QoE metrics from the RTC Access Function (via reference point RTC‑11) and submits metrics reports to the RTC AF via reference point RTC-5. The QoE metrics to be collected and reported are specified in clause 4.5.

The metrics reporting procedure is illustrated in figure 5.2.3.1-1.



Figure 5.2.3.1-1: Metrics reporting procedure

The call flow is as follows:

1. An RTC Application Provider provisions resources for RTC sessions with metrics collection and reporting support.

2. The RTC Media Session Handler requests configuration information from the RTC AF relating to metrics collection and reporting for RTC sessions and the RTC AF provides the requested configuration information to the RTC Media Session Handler.

3. The RTC Media Session Handler configures the metrics collection procedure in the RTC Access Function.

4. The RTC Access Function collects QoE metrics about the real-time media it has received.

5. The RTC Media Session Handler receives collected metrics from the RTC Access Function.

6. The RTC Media Session Handler collates the received QoS metrics into metrics reports.

7. The RTC Media Session Handler periodically submits metrics reports to the RTC AF.

#### 5.2.3.2 Metrics reporting by RTC AS

This procedure is used to provision the QoE metrics reporting feature in the RTC AF and subsequently to configure the RTC AS to collect and report QoE metrics for the real-time media it has received. The RTC AS collates the QoE metrics from its Media Function and submits metrics reports to the RTC AF via reference point RTC-3. The QoE metrics to be collected and reported are specified in clause 4.5.

The metrics reporting procedure is illustrated in figure 5.2.3.2-1.



Figure 5.2.3.2-1: Metrics reporting procedure

The call flow is as follows:

1. An RTC Application Provider provisions resources for RTC sessions with metrics collection and reporting support.

2. The RTC AS requests configuration information from the RTC AF relating to metrics collection and reporting for RTC sessions and the RTC AF provides the requested configuration information to the RTC AS.

3. The RTC AS configures the metrics collection procedure in its Media Function.

4. The RTC AS Media Function collects QoE metrics about the real-time media it has received.

5. The RTC AS collates the received QoS metrics into metrics reports.

6. The RTC AS periodically submits metrics reports to the RTC AF.

Next change

### 5.2.4 Consumption reporting

#### 5.2.4.1 Consumption reporting by RTC Access Function

This procedure is used to provision the collection of media consumption information in the RTC AF and subsequently to configure the RTC Media Session Handler of an RTC Client to collect and report consumption information for the real-time media it has received. The RTC Media Session Handler collates the consumption reporting information from the RTC Access Function (via reference point RTC‑11) and submits consumption reports to the RTC AF via reference point RTC-5. The media consumption information to be collected and reported is specified in clause 4.5.

The consumption reporting procedure is illustrated in figure 5.2.4.1-1.



Figure 5.2.4.1-1: Consumption reporting procedure

The call flow is as follows:

1. An RTC Application Provider provisions resources for RTC sessions with media consumption information collection and reporting support.

2. The RTC Media Session Handler requests the configuration information from the RTC AF relating to media consumption collection and reporting for RTC sessions and the RTC AF provides the requested configuration information to the RTC Media Session Handler.

3. The RTC Media Session Handler configures the media consumption information collection procedure in the RTC Access Function.

4. The RTC Access Function collects consumption information about the real-time media it has received.

5. The RTC Media Session Handler receives collected media consumption information from the RTC Access Function.

6. The RTC Media Session Handler collates the received media consumption information into consumption reports.

7. The RTC Media Session Handler periodically submits consumption reports to the RTC AF.

#### 5.2.4.2 Consumption reporting by RTC AS

This procedure is used to provision the collection of media consumption information in the RTC AF and subsequently to configure the RTC AS to collect and report consumption information for the real-time media it has received. The RTC AS collates the consumption reporting information from its Media Function and submits consumption reports to the RTC AF via reference point RTC-3. The media consumption information to be collected and reported is specified in clause 4.5.

The consumption reporting procedure is illustrated in figure 5.2.4.2-1.



Figure 5.2.4.2-1: Consumption reporting procedure

The call flow is as follows:

1. An RTC Application Provider provisions resources for RTC sessions with media consumption information collection and reporting support.

2. The RTC AS requests the configuration information from the RTC AF relating to media consumption collection and reporting for RTC sessions and the RTC AF provides the requested configuration information to the RTC AS.

3. The RTC AS configures the media consumption information collection procedure in its Media Function.

4. The RTC AS Media Function collects consumption information about the real-time media it has received.

5. The RTC AS collates the received media consumption information into consumption reports.

6. The RTC AS periodically submits consumption reports to the RTC AF.

End of changes