**3GPP TSG-RAN WG3 Meeting #116-eR3-223781**

**Online, May 9th – 19th 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.473** | **CR** | **0869** | **rev** | **1** | **Current version:** |  |  |
|  | | | | | | | | |
| *For* [***HELP***](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 | **X** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | QoE Rel-17 Corrections | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | RAN3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_QoE-Core | | | | |  | ***Date:*** | | | 2022-05-19 |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | * There is no reference to RAN visible QoE. * The names of the two RAN visible QoE metrics are not aligned with their counterparts in the TS 38.331, where they are originally defined. * The name of the section for QMC-specific procedures and messages refer to QoE, instead of QMC. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 3.2:   * Introduced the reference to RAN visible QoE.   3.2:   * Introduced the QMC abbreviation.   8.16, 9.2.:   * Changed the name of the chapter for QoE procedures to “QMC Procedures”.   9.2:   * Changed the name of the chapter for QoE messages to “QMC Messages”.   9.3.1.260:   * Changed the RAN visible QoE metrics names to "Application Layer Buffer Level List" and "Playout Delay for Media Startup".   9.4.5:   * Implemented the above changes in asn.1. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Unclear specification text. Misalignemnt of RVQoE metrics names with TS 38.331. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.1, 3.2, 8.16, 9.2.16, 9.3.1.260, 9.4.5. | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev1: revised based on the outcome of the online discussion. | | | | | | | | |

-------------------------------------------Start of changes-------------------------------------------

# 3 Definitions and abbreviations

## 3.1 Definitions

**elementary procedure:** F1AP consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between gNB-CU and gNB-DU. These Elementary Procedures are defined separately and are intended to be used to build up complete sequences in a flexible manner. If the independence between some EPs is restricted, it is described under the relevant EP description. Unless otherwise stated by the restrictions, the EPs may be invoked independently of each other as standalone procedures, which can be active in parallel. The usage of several F1AP EPs together is specified in stage 2 specifications (e.g., TS 38.470 [2]).

An EP consists of an initiating message and possibly a response message. Two kinds of EPs are used:

- **Class 1:** Elementary Procedures with response (success and/or failure).

- **Class 2:** Elementary Procedures without response.

For Class 1 EPs, the types of responses can be as follows:

Successful:

- A signalling message explicitly indicates that the elementary procedure successfully completed with the receipt of the response.

Unsuccessful:

- A signalling message explicitly indicates that the EP failed.

- On time supervision expiry (i.e., absence of expected response).

Successful and Unsuccessful:

- One signalling message reports both successful and unsuccessful outcome for the different included requests. The response message used is the one defined for successful outcome.

Class 2 EPs are considered always successful.

**BH RLC channel:** as defined in TS 38.300 [6].

**Conditional handover:** as defined in TS 38.300 [6].

**Conditional PSCell Addition:** as defined in TS 37.340 [7].

**Conditional PSCell Change:** as defined in TS 37.340 [7].

**DAPS Handover**: as defined in TS 38.300 [6].

**EN-DC operation:** Used in this specification when the F1AP is applied for gNB-CU and gNB-DU in E-UTRAN.

**gNB:** as defined in TS 38.300 [6].

**gNB-CU:** as defined in TS 38.401 [4].

**gNB-CU UE F1AP ID:** as defined in TS 38.401 [4].

**gNB-DU:** as defined in TS 38.401 [4].

**gNB-DU UE F1AP ID:** as defined in TS 38.401 [4].

**en-gNB:** as defined in TS 37.340 [7].

**IAB-MT**: as defined in TS 38.300 [6].

**IAB-DU**: as defined in TS 38.300 [6].

**IAB-node**: as defined in TS 38.300 [6].

**IAB-donor**:as defined in TS 38.300 [6].

**IAB-donor-CU**: as defined in TS 38.401 [4].

**IAB-donor-DU**: as defined in TS 38.401 [4].

**Public network integrated NPN:** as defined in TS 23.501 [21].

**Stand-alone Non-Public Network**: as defined in TS 23.501 [21].

**UE-associated signalling:** When F1AP messages associated to one UE uses the UE-associated logical F1-connection for association of the message to the UE in gNB-DU and gNB-CU.

**UE-associated logical F1-connection:** The UE-associated logical F1-connection uses the identities *GNB-CU UE F1AP ID* and *GNB-DU UE F1AP ID* according to the definition in TS 38.401 [4]. For a received UE associated F1AP message thegNB-CU identifies the associated UE based on the *GNB-CU UE F1AP ID* IE and the gNB-DU identifies the associated UE based on the *GNB-DU UE F1AP ID* IE*.* The UE-associated logical F1-connection may exist before the F1 UE context is setup in gNB-DU.

**U2N Relay UE:** a UE that provides functionality to support connectivity to the network for U2N Remote UE(s).

**U2N Remote UE:** a UE that communicates with the network via a U2N Relay UE.

**Uu RLC channel:** as defined in TS 38.300 [6].

**PC5 RLC channel:** as defined in TS 38.300 [6].

**SRAP:** Sidelink relay adaptation protocol, as defined in TS 38.300 [6].

**RAN visible QoE measurements:** as defined in TS 38.300 [6].

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 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 TR 21.905 [1].

5GC 5G Core Network

5QI 5G QoS Identifier

AMF Access and Mobility Management Function

ARP Antenna Reference Point

ARPI Additional RRM Policy Index

BH Backhaul

CAG Closed Access Group

CN Core Network

CG Cell Group

CG-SDT Configured Grant-Small Data Transmission

CGI Cell Global Identifier

CHO Conditional Handover

CP Control Plane

CPA Conditional PSCell Addition

CPC Conditional PSCell Change

DAPS Dual Active Protocol Stack

DL Downlink

DL-PRS Downlink Positioning Reference Signal

EN-DC E-UTRA-NR Dual Connectivity

EPC Evolved Packet Core

FSA ID MBS Frequency Selection Area (FSA) ID

IAB Integrated Access and Backhaul

IMEISV International Mobile station Equipment Identity and Software Version number

LMF Location Management Function

MBS Multicast/Broadcast Service

NID Network Identifier

NPN Non-Public Network

NSSAI Network Slice Selection Assistance Information

PDC Propagation Delay Compensation

PEIPS Paging Early Indication with Paging Subgrouping

posSIB Positioning SIB

PNI-NPN Public Network Integrated NPN

PTP Point to Point

PTM Point to Multipoint

QMC QoE Measurement Collection

QoE Quality of Experience

RANAC RAN Area Code

RedCap Reduced Capability

RIM Remote Interference Management

RIM-RS RIM Reference Signal

RRC Radio Resource Control

RSRP Reference Signal Received Power

SDT Small Data Transmission

SNPN Stand-alone Non-Public Network

S-NSSAI Single Network Slice Selection Assistance Information

SUL Supplementary Uplink

TAC Tracking Area Code

TAI Tracking Area Identity

TEG Timing Error Group

TRP Transmission-Reception Point

UL-AoA Uplink Angle of Arrival

UL-RTOA Uplink Relative Time of Arrival

UL-SRS Uplink Sounding Reference Signal

Z-AoA Zenith Angles of Arrival

-------------------------------------------Next change-------------------------------------------

## 8.16 QMC Procedures

### 8.16.1 QoE Information Transfer

#### 8.16.1.1 General

The purpose of the QoE Information Transfer procedure is to transfer RAN visible QoE information from the gNB-CU to the gNB-DU. The procedure uses UE-associated signalling.

8.16.1.2 Successful operation



Figure 8.16.1.2-1: QoE Information Transfer procedure.

The gNB-CU initiates the procedure by sending the QOE INFORMATION TRANSFER message to the gNB-DU.

If the *QoE Information List* IE is included in QOE INFORMATION TRANSFER message, the gNB-DU may take it into account according to TS 38.300 [6].

#### 8.16.1.3 Abnormal Conditions

Not applicable.

**>>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<<**

# 9 Elements for F1AP Communication

**>>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<<**

## 9.2 Message Functional Definition and Content

**>>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<<**

### 9.2.16 QMC messages

#### 9.2.16.1 QOE INFORMATION TRANSFER

This message is sent by a gNB-CU to a gNB-DU, to indicate information related to RAN visible QoE.

Direction: gNB-CU → gNB-DU.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.3.1.1 |  | YES | ignore |
| gNB-CU UE F1AP ID | M |  | 9.3.1.4 |  | YES | reject |
| gNB-DU UE F1AP ID | M |  | 9.3.1.5 |  | YES | reject |
| **QoE Information List** |  |  | *0..1* |  | YES | ignore |
| **>QoE Information Item** |  |  | *1..<maxnoofQoEInformation>* |  | Each | ignore |
| >>QoE Metrics | O |  | 9.3.1.260 |  | - | - |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofQoEInformation | Maximum no. of QoE information for one UE, the maximum value is 16. |

## 9.3 Information Element Definitions

### 9.3.1 Radio Network Layer Related IEs

**>>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<<**

#### 9.3.1.260 QoE Metrics

This IE provides the RAN visible QoE measurement report to gNB-DU.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Application Layer Buffer Level List | O |  | OCTET STRING | As defined in TS 38.331 [8]. |
| Playout Delay for Media Startup | O |  | OCTET STRING | As defined in TS 38.331 [8]. |

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### 9.4.5 Information Element Definitions

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- Information Element Definitions

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

F1AP-IEs {

itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)

ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

**>>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<<**

FROM F1AP-Containers;

-- A

AbortTransmission ::= CHOICE {

sRSResourceSetID SRSResourceSetID,

releaseALL NULL,

choice-extension ProtocolIE-SingleContainer { { AbortTransmission-ExtIEs } }

}

**>>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<<**

AngleMeasurementType ::= CHOICE {

expected-ULAoA Expected-UL-AoA,

expected-ZoA Expected-ZoA-only,

choice-extension ProtocolIE-SingleContainer { { AngleMeasurementType-ExtIEs } }

}

AngleMeasurementType-ExtIEs F1AP-PROTOCOL-IES ::= {

...

}

AppLayerBufferLevelList ::= OCTET STRING

ARP-ID ::= INTEGER (1..16, ...)

-- B

BAP-Header-Rewriting-List-Item::= SEQUENCE {

ingressBAPRoutingID BAPRoutingID,

egressBAPRoutingID BAPRoutingID,

nonF1terminatingTopologyIndicator NonF1terminatingTopologyIndicator OPTIONAL,

iE-Extensions ProtocolExtensionContainer { { BAP-Header-Rewriting-List-Item-ExtIEs} } OPTIONAL

}

BAP-Header-Rewriting-List-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

...

}

**>>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<<**

BroadcastPNI-NPN-ID-List-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {

...

}

BufferSizeThresh ::= INTEGER(0..16777215)

BurstArrivalTime ::= OCTET STRING

**>>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<<**

**>>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<<**

-- P

PacketDelayBudget ::= INTEGER (0..1023, ...)

**>>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<<**

PLMN-Identity ::= OCTET STRING (SIZE(3))

PlayoutDelayForMediaStartup ::= OCTET STRING

PortNumber ::= BIT STRING (SIZE (16))

**>>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<<**

-- Q

QCI ::= INTEGER (0..255)

QoEInformationList ::= SEQUENCE (SIZE(1.. maxnoofQoEInformation)) OF QoEInformationList-Item

QoEInformationList-Item ::= SEQUENCE {

qoEMetrics QoEMetrics OPTIONAL,

iE-Extensions ProtocolExtensionContainer { { QoEInformationList-ItemExtIEs} } OPTIONAL

}

QoEInformationList-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {

...

}

QoEMetrics ::= SEQUENCE {

appLayerBufferLevelList AppLayerBufferLevelList OPTIONAL,

playoutDelayForMediaStartup PlayoutDelayForMediaStartup OPTIONAL,

iE-Extensions ProtocolExtensionContainer { { QoEMetricsExtIEs} } OPTIONAL,

...

}

QoEMetricsExtIEs F1AP-PROTOCOL-EXTENSION ::= {

...

}

QoS-Characteristics ::= CHOICE {

non-Dynamic-5QI NonDynamic5QIDescriptor,

dynamic-5QI Dynamic5QIDescriptor,

choice-extension ProtocolIE-SingleContainer { { QoS-Characteristics-ExtIEs } }

}

**>>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<<**

END

-- ASN1STOP

-------------------------------------------End of changes------------------------------------------