**3GPP TSG-RAN3 Meeting #114-e R3-216144**

**Electronic meeting, 1st - 11th Nov 2021**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v11.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.473** | **CR** | **0826** | **rev** | **2** | **Current version:** | **16.7.0** |  |
|  | | | | | | | | |
| *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:*** | Support of QoE information transfer | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | R3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_QoE | | | | |  | | ***Date:*** | | 2021-10-20 |
|  |  | | | |  | | |  | |  |
| ***Category:*** | **B** |  | | | | | | ***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-12 (Release 12) Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Support of QoE information transfer. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | For RAN visible QoE, the QoE information can be used for QoE aware scheduling. to support the QoE inforamtion transfer, the following changes are made:  1. New abbreviation of QoE is introduced.  2. New procedure QoE Information Transfer is added.  3. New IEs is added in QOE INFORMATION TRANSFER messages. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | gNB-DU cannot know the QoE informaiton. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.2, 8. 1, 8.x, 9.2.x | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

*<Start of change>*

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

CGI Cell Global Identifier

CHO Conditional Handover

CP Control Plane

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

IAB Integrated Access and Backhaul

IMEISV International Mobile station Equipment Identity and Software Version number

LMF Location Management Function

NID Network Identifier

NPN Non-Public Network

NSSAI Network Slice Selection Assistance Information

posSIB Positioning SIB

PNI-NPN Public Network Integrated NPN

RANAC RAN Area Code

RIM Remote Interference Management

RIM-RS RIM Reference Signal

RRC Radio Resource Control

RSRP Reference Signal Received Power

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

TRP Transmission-Reception Point

QoE Quality of Experience

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>*

8.1 List of F1AP Elementary procedures

In the following tables, all EPs are divided into Class 1 and Class 2 EPs (see subclause 3.1 for explanation of the different classes):

**Table 1: Class 1 procedures**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Elementary Procedure** | | **Initiating Message** | | **Successful Outcome** | | **Unsuccessful Outcome** | |
| **Response message** | | **Response message** | |
| Reset | | RESET | | RESET ACKNOWLEDGE | |  | |
| F1 Setup | | F1 SETUP REQUEST | | F1 SETUP RESPONSE | | F1 SETUP FAILURE | |
| gNB-DU Configuration Update | | GNB-DU CONFIGURATION UPDATE | | GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE | | GNB-DU CONFIGURATION UPDATE FAILURE | |
| gNB-CU Configuration Update | | GNB-CU CONFIGURATION UPDATE | | GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE | | GNB-CU CONFIGURATION UPDATE FAILURE | |
| UE Context Setup | | UE CONTEXT SETUP REQUEST | | UE CONTEXT SETUP RESPONSE | | UE CONTEXT SETUP FAILURE | |
| UE Context Release (gNB-CU initiated) | | UE CONTEXT RELEASE COMMAND | | UE CONTEXT RELEASE COMPLETE | |  | |
| UE Context Modification (gNB-CU initiated) | | UE CONTEXT MODIFICATION REQUEST | | UE CONTEXT MODIFICATION RESPONSE | | UE CONTEXT MODIFICATION FAILURE | |
| UE Context Modification Required (gNB-DU initiated) | | UE CONTEXT MODIFICATION REQUIRED | | UE CONTEXT MODIFICATION CONFIRM | | UE CONTEXT MODIFICATION REFUSE | |
| Write-Replace Warning | | WRITE-REPLACE WARNING REQUEST | | WRITE-REPLACE WARNING RESPONSE | |  | |
| PWS Cancel | | PWS CANCEL REQUEST | | PWS CANCEL RESPONSE | |  | |
| gNB-DU Resource Coordination | | GNB-DU RESOURCE COORDINATION REQUEST | | GNB-DU RESOURCE COORDINATION RESPONSE | |  | |
| F1 Removal | | F1 REMOVAL REQUEST | | F1 REMOVAL RESPONSE | | F1 REMOVAL FAILURE | |
| BAP Mapping Configuration | | BAP MAPPING CONFIGURATION | | BAP MAPPING CONFIGURATION ACKNOWLEDGE | | BAP MAPPING CONFIGURATION FAILURE | |
| GNB-DU Resource Configuration | | GNB-DU RESOURCE CONFIGURATION | | GNB-DU RESOURCE CONFIGURATION ACKNOWLEDGE | | GNB-DU RESOURCE CONFIGURATION FAILURE | |
| IAB TNL Address Allocation | | IAB TNL ADDRESS REQUEST | | IAB TNL ADDRESS RESPONSE | | IAB TNL ADDRESS FAILURE | |
| IAB UP Configuration Update | | IAB UP CONFIGURATION UPDATE REQUEST | | IAB UP CONFIGURATION UPDATE RESPONSE | | IAB UP CONFIGURATION UPDATE FAILURE | |
| Resource Status Reporting Initiation | | RESOURCE STATUS REQUEST | | RESOURCE STATUS RESPONSE | | RESOURCE STATUS FAILURE | |
| Positioning Measurement | | POSITIONING MEASUREMENT REQUEST | | POSITIONING MEASUREMENT RESPONSE | | POSITIONING MEASUREMENT FAILURE | |
| Positioning Information Exchange | | POSITIONING INFORMATION REQUEST | | POSITIONING INFORMATION RESPONSE | | POSITIONING INFORMATION FAILURE | |
| TRP Information Exchange | | TRP INFORMATION REQUEST | | TRP INFORMATION RESPONSE | | TRP INFORMATION FAILURE | |
| Positioning Activation | | POSITIONING ACTIVATION REQUEST | | POSITIONING ACTIVATION RESPONSE | | POSITIONING ACTIVATION FAILURE | |
| E-CID Measurement Initiation | | E-CID MEASUREMENT INITIATION REQUEST | | E-CID MEASUREMENT INITIATION RESPONSE | | E-CID MEASUREMENT INITIATION FAILURE | |

**Table 2: Class 2 procedures**

|  |  |  |  |
| --- | --- | --- | --- |
| **Elementary Procedure** | | **Message** | |
| Error Indication | | ERROR INDICATION | |
| UE Context Release Request (gNB-DU initiated) | | UE CONTEXT RELEASE REQUEST | |
| Initial UL RRC Message Transfer | | INITIAL UL RRC MESSAGE TRANSFER | |
| DL RRC Message Transfer | | DL RRC MESSAGE TRANSFER | |
| UL RRC Message Transfer | | UL RRC MESSAGE TRANSFER | |
| UE Inactivity Notification | | UE INACTIVITY NOTIFICATION | |
| System Information Delivery | | SYSTEM INFORMATION DELIVERY COMMAND | |
| Paging | | PAGING | |
| Notify | | NOTIFY | |
| PWS Restart Indication | | PWS RESTART INDICATION | |
| PWS Failure Indication | | PWS FAILURE INDICATION | |
| gNB-DU Status Indication | | GNB-DU STATUS INDICATION | |
| RRC Delivery Report | | RRC DELIVERY REPORT | |
| Network Access Rate Reduction | | NETWORK ACCESS RATE REDUCTION | |
| Trace Start | | TRACE START | |
| Deactivate Trace | | DEACTIVATE TRACE | |
| DU-CU Radio Information Transfer | | DU-CU RADIO INFORMATION TRANSFER | |
| CU-DU Radio Information Transfer | | CU-DU RADIO INFORMATION TRANSFER | |
| Resource Status Reporting | | RESOURCE STATUS UPDATE | |
| Access And Mobility Indication | | ACCESS AND MOBILITY INDICATION | |
| Reference Time Information Reporting Control | | REFERENCE TIME INFORMATION REPORTING CONTROL | |
| Reference Time Information Report | | REFERENCE TIME INFORMATION REPORT | |
| Access Success | | ACCESS SUCCESS | |
| Cell Traffic Trace | | CELL TRAFFIC TRACE | |
| Positioning Assistance Information Control | | POSITIONING ASSISTANCE INFORMATION CONTROL | |
| Positioning Assistance Information Feedback | | POSITIONING ASSISTANCE INFORMATION FEEDBACK | |
| Positioning Measurement Report | | POSITIONING MEASUREMENT REPORT | |
| Positioning Measurement Abort | | POSITIONING MEASUREMENT ABORT | |
| Positioning Measurement Failure Indication | | POSITIONING MEASUREMENT FAILURE INDICATION | |
| Positioning Measurement Update | | POSITIONING MEASUREMENT UPDATE | |
| Positioning Deactivation | | POSITIONING DEACTIVATION | |
| E-CID Measurement Failure Indication | | E-CID MEASUREMENT FAILURE INDICATION | |
| E-CID Measurement Report | | E-CID MEASUREMENT REPORT | |
| E-CID Measurement Termination | | E-CID MEASUREMENT TERMINATION COMMAND | |
| Positioning Information Update | | POSITIONING INFORMATION UPDATE | |
| QoE Information Transfer | | QOE INFORMATION TRANSFER | |

*Editor’s note: further refinement is possible. This note applies to the whole BL CR.*

*<Next change>*

8.X QoE Information Transfer procedures

8.X.1 QoE Information Transfer

8.X.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.X.1.2 Successful operation



**Figure 8.X.1.2-1: QoE Information Transfer procedures.**

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

The gNB-DU considers QoE information for scheduling.

8.X.1.3 Abnormal Conditions

Not applicable.

*<Next change>*

9.2.X QoE Information Transfer messages

9.2.X.1 QOE INFORMATION TRANSFER [FFS]

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

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** |  |  |  |  |  |  |
| **>QoE Information Item** |  |  | *1..<maxnoofQoEInformation>* |  |  |  |
| >>QoE Metric List | O |  | FFS |  | - | - |
| >>>Buffer level | O |  | FFS |  |  |  |
| >>>Playout delay | O |  | FFS |  |  |  |
| **>DRB related info** [FFS] |  |  |  |  |  |  |

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

*<End of change>*