**3GPP TSG-RAN3 Meeting #108-e R3-204117**

**June 1st – 12th 2020, Online**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **36.413**  | **CR** | **1726** | **rev** | **3** | **Current version:** | **16.1.0** |  |
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| *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:***  | CR TS 36.413 on QoE measurement collection support for S1AP |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | RAN3 |
|  |  |
| ***Work item code:*** | TEI16 |  | ***Date:*** | 2020-06-04 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *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 canbe 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 attributes for QoE measurements and align to TS 28.405 as per SA5 LS S5-202305 |
|  |  |
| ***Summary of change:*** | Introduction of attributes for QoE measurement purpose: “QMC ID” to identify the QoE measurement collection job, “Recording Session Indication” to identify the QoE recording session, “WithinArea” to propagate QoE measurement collection at handover. |
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| ***Consequences if not approved:*** | Lack of support for QoE measurements and misalignment between Stage 3 specification and Stage 2 specification.  |
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| ***Clauses affected:*** | 2, 8.4.2.1, 8.4.2.2, 9.2.1.7, 9.2.1.8, 9.2.1.128, 9.3.4, 9.3.6 |
|  |  |
|  | **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:*** | Rev. 1 – Submitted at TSG W3 Meeting #106Rev. 2 – Submitted at TSG W3 Meeting #108-e in response to LS S5-202305 and LS S5-202304. Title changed from “On QoE measurement collection” to “CR TS 36.413 on QoE measurement collection support for S1AP”. Rebased on 36.413 v16.1.0Rev. 3 – based on RAN3#108-e discussions |

*Start of the first change*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 36.401: "E-UTRAN Architecture Description".

[3] 3GPP TS 36.410: "S1 General Aspects and Principles".

[4] ITU-T Recommendation X.691 (07/2002): "Information technology – ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".

[5] ITU-T Recommendation X.680 (07/2002): "Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[6] ITU-T Recommendation X.681 (07/2002): "Information technology – Abstract Syntax Notation One (ASN.1): Information object specification".

[7] Void

[8] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses".

[9] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC)".

[10] 3GPP TS 32.422: "Trace control and configuration management".

[11] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for E-UTRAN access".

[12] 3GPP TS 36.414: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 data transport".

[13] 3GPP TS 23.203: "Policy and charging control architecture"

[14] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA), Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".

[15] 3GPP TS 33.401: "Security architecture".

[16] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRAN); Radio Resource Control (RRC) Protocol Specification".

[17] 3GPP TS 23.272: "Circuit Switched Fallback in Evolved Packet System; Stage 2".

[18] 3GPP TS 48.018: "General Packet Radio Service (GPRS); BSS GPRS Protocol (BSSGP)".

[19] 3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

[20] 3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA), User Equipment (UE) procedures in idle mode".

[21] 3GPP TS 23.003: "Technical Specification Group Core Network and Terminals; Numbering, addressing and identification".

[22] 3GPP TS 36.423: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 Application Protocol (X2AP)".

[23] 3GPP TS 48.008: "Mobile Switching Centre-Base Station System (MSC-BSS) interface; Layer 3 specification".

[24] 3GPP TS 24.301: "Non-Access Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

[25] 3GPP2 A.S0008-C: "Interoperability Specification (IOS) for High Rate Packet Data (HRPD) Radio Access Network Interfaces with Session Control in the Access Network".

[26] 3GPP TS 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures".

[27] 3GPP2 C.S0024-B: "cdma2000 High Rate Packet Data Air Interface Specification".

[28] 3GPP TS 22.220: "Service requirements for Home Node Bs and Home eNode Bs".

[29] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".

[30] 3GPP TS 48.016: "General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN) interface; Network service".

[31] 3GPP TS 37.320: "Universal Terrestrial Radio Access (UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRA); Radio measurement collection for Minimization of Drive Tests (MDT);Overall description; Stage 2".

[32] 3GPP TS 29.281: "General Packet Radio Service (GPRS); Tunnelling Protocol User Plane (GTPv1-U)".

[33] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[34] 3GPP TS 36.455: "Evolved Universal Terrestrial Radio Access (E-UTRA); LTE Positioning Protocol A (LPPa)".

[35] 3GPP TS 29.060: "GPRS Tunnelling Protocol (GTP) across the Gn and Gp interface".

[36] 3GPP TS 29.274: "Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3".

[37] 3GPP TS 23.139: "3GPP system – fixed broadband access network interworking".

[38] 3GPP TS 23.007: "Technical Specification Group Core Network Terminals; Restoration procedures".

[39] 3GPP TS 36.104: "Base Station (BS) radio transmission and reception".

[40] 3GPP TR 25.921 (version.7.0.0): "Guidelines and principles for protocol description and error handling".

[41] 3GPP TS 36.306: "User Equipment (UE) radio access capabilities".

[42] IETF RFC 5905 (2010-06): "Network Time Protocol Version 4: Protocol and Algorithms Specification".

[43] 3GPP TS 26.247: "Transparent end-to-end Packet-switched Streaming Service (PSS); Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH)".

[44] 3GPP TS 38.413: "NG Radio Access Network (NG-RAN); NG Application Protocol (NGAP)".

[45] 3GPP TS 38.300: "NR; Overall description; Stage-2".

[46] 3GPP TS 23.501: "System Architecture for the 5G System".

[47] 3GPP TS 37.340: "NR; Multi-connectivity; Overall description; Stage-2".

[xx] 3GPP TS 28.405: " Quality of Experience (QoE) measurement collection; Control and configuration".

*Next change*

### 8.4.2 Handover Resource Allocation

#### 8.4.2.1 General

The purpose of the Handover Resource Allocation procedure is to reserve resources at the target eNB for the handover of a UE.

#### 8.4.2.2 Successful Operation



Figure 8.4.2.2-1: Handover resource allocation: successful operation

The MME initiates the procedure by sending the HANDOVER REQUEST message to the target eNB. The HANDOVER REQUEST message may contain the *Handover Restriction List* IE, which contains roaming or access restrictions.

If the *Handover Restriction List* IE is contained in the HANDOVER REQUEST message, the target eNB shall store this information in the UE context. This information shall however not be considered whenever one of the handed over E-RABs has a particular ARP value (TS 23.401 [11]).

The target eNB shall use the information in *Handover Restriction List* IE if present in the HANDOVER REQUEST message to

- determine a target for subsequent mobility action for which the eNB provides information about the target of the mobility action towards the UE;

- select a proper SCG during dual connectivity operation.

If the *Handover Restriction List* IE is not contained in the HANDOVER REQUEST message, the target eNB shall consider that no roaming and no access restriction apply to the UE.

Upon reception of the HANDOVER REQUEST message the eNB shall store the received *UE Security Capabilities* IE in the UE context and use it to prepare the configuration of the AS security relation with the UE.

If the *SRVCC Operation Possible* IE is included in the HANDOVER REQUEST message, the target eNB shall store the content of the received *SRVCC Operation Possible* IE in the UE context and, if supported, use it as defined in TS 23.216 [9].

Upon reception of the HANDOVER REQUEST message the eNB shall store the received *Security Context* IE in the UE context and the eNB shall use it to derive the security configuration as specified in TS 33.401 [15].

If the *Trace Activation* IE is included in the HANDOVER REQUEST message, the target eNB shall if supported, initiate the requested trace function as described in TS 32.422 [10]. In particular, the eNB shall, if supported:

- if the *Trace Activation* IE does not include the *MDT Configuration* IE, initiate the requested trace session as described in TS 32.422 [10];

- if the *Trace Activation* IE includes the *MDT Activation* IE, within the *MDT Configuration* IE, set to “Immediate MDT and Trace”, initiate the requested trace session and MDT session as described in TS 32.422 [10];

- if the *Trace Activation* IE includes the *MDT Activation* IE, within the *MDT Configuration* IE, set to “Immediate MDT Only”, “Logged MDT only” or “Logged MBSFN MDT”, initiate the requested MDT session as described in TS 32.422 [10] and the target eNB shall ignore *Interfaces To Trace* IE, and *Trace Depth* IE.

- if the *Trace Activation* IE includes the *MDT Location Information* IE, within the *MDT Configuration* IE, store this information and take it into account in the requested MDT session.

- if the *Trace Activation* IE includes the *Signalling based MDT PLMN List* IE, within the *MDT Configuration* IE, the eNB may use it to propagate the MDT Configuration as described in TS 37.320 [31].

- if the *Trace Activation* IE includes the *MBSFN-ResultToLog* IE, within the *MDT Configuration* IE, take it into account for MDT Configuration as described in TS 37.320 [31].

- if the *Trace Activation* IE includes the *MBSFN-AreaId* IE in the *MBSFN-ResultToLog* IE, within the *MDT Configuration* IE, take it into account for MDT Configuration as described in TS 37.320 [31].

- if the *Trace Activation* IE includes the *UE Application layer measurement configuration* IE,initiate the requested trace session and QoE Measurement Collection function as described in TS 36.300 [14].- if the *Trace Activation* IE includes the *Bluetooth Measurement Configuration* IE, within the *MDT Configuration* IE, take it into account for MDT Configuration as described in TS 37.320 [31].

- if the *Trace Activation* IE includes the *WLAN Measurement Configuration* IE, within the *MDT Configuration* IE, take it into account for MDT Configuration as described in TS 37.320 [31].

If the *CSG Id* IE is received in the HANDOVER REQUEST message, the eNB shall compare the received value with the CSG Id broadcast by the target cell.

If the *CSG Membership Status* IE is received in the HANDOVER REQUEST message and the *CSG Membership Status* is set to “member”, the eNB may provide the QoS to the UE as for member provided that the CSG Id received in the HANDOVER REQUEST messages corresponds to the CSG Id broadcast by the target cell.

If the *CSG Membership Status* IE and the *CSG Id* IE are received in the HANDOVER REQUEST message and the CSG Id does not correspond to the CSG Id broadcast by the target cell, the eNB may provide the QoS to the UE as for a non member and shall send back in the HANDOVER REQUEST ACKNOWLEDGE message the actual CSG Id broadcast by the target cell.

If the target cell is CSG cell or hybrid cell, the target eNB shall include the *CSG ID* IE in the HANDOVER REQUEST ACKNOWLEDGE message.

If the target eNB receives the *CSG Id* IE and the *CSG Membership Status* IE is set to “non member” in the HANDOVER REQUEST message and the target cell is a closed cell and at least one of the E-RABs has a particular ARP value (see TS 23.401 [11]), the eNB shall send back the HANDOVER REQUEST ACKNOWLEDGE message to the MME accepting those E-RABs and failing the other E-RABs.

If the *Subscriber Profile ID* *for RAT/Frequency priority* IE is contained in the *Source eNB to Target eNB Transparent Container* IE, the target eNB shall store the content of the received *Subscriber Profile ID for RAT/Frequency priority* IE in the UE context and use it as defined in TS 36.300 [14].

If the *Additional RRM Policy Index* IE is contained in the *Source eNB to Target eNB Transparent Container* IE, the target eNB shall, if supported, store it and use it as defined in TS 36.300 [14].

Upon reception of the *UE History Information* IE, which is included within the *Source eNB to Target eNB Transparent Container* IE in the HANDOVER REQUEST message, the target eNB shall collect the information defined as mandatory in the *UE History Information* IE and shall, if supported, collect the information defined as optional in the *UE History Information* IE, for as long as the UE stays in one of its cells, and store the collected information to be used for future handover preparations.

Upon reception of the *UE History Information from the UE* IE, which is included within the *Source eNB to Target eNB Transparent Container* IE in the HANDOVER REQUEST message, the target eNB shall, if supported, store the collected information, to be used for future handover preparations.

If the *Mobility Information* IE is included within the *Source eNB to Target eNB Transparent Container* IE in the HANDOVER REQUEST message, the target eNB shall, if supported, store this information and use it as defined in TS 36.300 [14].

If the *Expected UE Behaviour* IE is included in the HANDOVER REQUEST message, the eNB shall, if supported, store this information and may use it to determine the RRC connection time.

If the *Bearer Type* IE is included in the HANDOVER REQUEST message and is set to “non IP”, then the eNB shall not perform header compression for the concerned E-RAB.

In case of inter-system handover from gNB with direct forwarding, if the target eNB receives the *UE Context Reference at Source* IE in the *Source eNB to Target eNB Transparent Container* IE, it may use it for internal forwarding as specified in TS 37.340 [47].

After all necessary resources for the admitted E-RABs have been allocated, the target eNB shall generate the HANDOVER REQUEST ACKNOWLEDGE message. The target eNB shall include in the *E-RABs Admitted List* IE the E-RABs for which resources have been prepared at the target cell. The E-RABs that have not been admitted in the target cell, if any, shall be included in the *E-RABs Failed to Setup List* IE.

If the HANDOVER REQUEST message contains the *Data Forwarding Not Possible* IE associated with a given E-RAB within the *E-RABs To Be Setup List* IE set to “Data forwarding not possible”, then the target eNB may decide not to include the *DL Transport Layer Address* IE and the *DL GTP-TEID* IE and for intra LTE handover the *UL Transport Layer Address* IE and the *UL GTP-TEID* IE within the *E-RABs Admitted List* IE of the HANDOVER REQUEST ACKNOWLEDGE message for that E-RAB.

For each bearer that target eNB has decided to admit and for which *DL forwarding* IE is set to “DL forwarding proposed”, the target eNB may include the *DL GTP-TEID* IE and the *DL Transport Layer Address* IE within the *E-RABs Admitted List* IE of the HANDOVER REQUEST ACKNOWLEDGE message indicating that it accepts the proposed forwarding of downlink data for this bearer.

If the HANDOVER REQUEST ACKNOWLEDGE message contains the *UL GTP-TEID* IE and the *UL Transport Layer Address* IE for a given bearer in the *E-RABs Admitted List* IE, then it means the target eNB has requested the forwarding of uplink data for this given bearer.

If the *Request Type* IE is included in the HANDOVER REQUEST message, then the target eNB should perform the requested location reporting functionality for the UE as described in subclause 8.11.

If the *UE Security Capabilities* IE included in the HANDOVER REQUEST message only contains the EIA0 algorithm as defined in TS 33.401 [15] and if this EIA0 algorithm is defined in the configured list of allowed integrity protection algorithms in the eNB (TS 33.401 [15]), the eNB shall take it into use and ignore the keys received in the *Security Context* IE.

The *GUMMEI* IE shall only be contained in the HANDOVER REQUEST message according to subclauses 4.6.2 and 4.7.6.6 of TS 36.300 [14]. If the *GUMMEI* IE is present, the target eNB shall store this information in the UE context and use it for subsequent X2 handovers.

The *MME UE S1AP ID 2* IE shall only be contained in the HANDOVER REQUEST message according to subclause 4.6.2 of TS 36.300 [14].If the *MME UE S1AP ID 2* IE is present, the target eNB shall store this information in the UE context and use it for subsequent X2 handovers.

If the *Management Based MDT Allowed* IE only or the *Management Based MDT Allowed* IE and the *Management Based MDT PLMN List* IE is contained in the HANDOVER REQUEST message, the target eNB shall, if supported, store the received information in the UE context, and use this information to allow subsequent selections of the UE for management based MDT defined in TS 32.422 [10].

If the *Masked IMEISV* IE is contained in the HANDOVER REQUEST message the target eNB shall, if supported, use it to determine the characteristics of the UE for subsequent handling.

If the HANDOVER REQUEST contains a *Target Cell ID* IE, as part of the *Source eNB to Target eNB Transparent Container* IE, for a cell which is no longer active, the eNB may respond with an HANDOVER REQUEST ACKNOWLEDGE in case the PCI of the deactivated cell is in use by another active cell.

If the *ProSe Authorized* IE is contained in the HANDOVER REQUEST message and it contains one or more IEs set to “authorized”, the eNB shall, if supported, consider that the UE is authorized for the relevant ProSe service(s).

If the *UE User Plane CIoT Support Indicator* IE is included in the HANDOVER REQUEST message and is set to "supported", the eNB shall, if supported, consider that User Plane CIoT EPS Optimisation as specified in TS 23.401 [11] is supported for the UE.

If the *CE-mode-B Support Indicator* IE is included in the HANDOVER REQUEST ACKNOWLEDGE message and set to "supported", the MME shall, if supported, take this information into account when setting NAS timer values for the UE as specified in TS 24.301[24].

If the *V2X Services Authorized* IE is contained in the HANDOVER REQUEST message and it contains one or more IEs set to “authorized”, the eNB shall, if supported, consider that the UE is authorized for the relevant service(s).

If the *UE Sidelink Aggregate Maximum Bit Rate* IE is included in the HANDOVER REQUEST message, the eNB shall, if supported, use the received value for the concerned UE’s sidelink communication in network scheduled mode for V2X services.

If the *Enhanced Coverage Restricted* IE is included in the HANDOVER REQUEST message, the eNB shall store this information in the UE context and use it as defined in TS 23.401 [11].

If the *CE-Mode-B Restricted* IE is included in the HANDOVER REQUEST message and the *Enhanced Coverage Restricted* IE is not set to *restricted* and the Enhanced Coverage Restricted information stored in the UE context is not set to *restricted*, the eNB shall store this information in the UE context and use it as defined in TS 23.401 [11].

If the *NR UE Security Capabilities* IE is included in the HANDOVER REQUEST message, the eNB shall, if supported, store this information in the UE context and use it as defined in TS 33.401 [15].

If the *Aerial UE subscription information* IE is included in the HANDOVER REQUEST message, the eNB shall, if supported, store this information in the UE context and use it as defined in TS 36.300 [14].

If the *Pending Data Indication* IE is included in the HANDOVER REQUEST message, the eNB shall use it as defined in TS 23.401 [11].

If the *Subscription Based UE Differentiation Information* IE is included in the HANDOVER REQUEST message, the eNB shall, if supported, store this information in the UE context for further use according to TS 23.401 [11].

If the *Additional RRM Policy Index* IE is contained in the HANDOVER REQUEST message, the eNB shall, if supported, store it and use it as defined in TS 36.300 [14].

If the HANDOVER REQUEST message is received for an handover originating from a source NG-RAN node, the list of E-RABs contained in the source eNB to target eNB Transparent Container which are not included in the HANDOVER REQUEST message shall be considered as not to be handed over and ignored.

If the *UE Application layer measurement configuration* IE is included within the *Source eNB to Target eNB Transparent Container* IE in the HANDOVER REQUEST message, and if the target eNB is within the QoE measurement area scope, and if the *Recording Session Indication* IE is set to “off”, the target eNB shall, if supported, initiate the requested trace session and QoE Measurement Collection function as described in TS 36.300 [14].

If the *UE Application layer measurement configuration* IE is included within the *Source eNB to Target eNB Transparent Container* IE in the HANDOVER REQUEST message, and if the target eNB is within the QoE measurement area scope, and if the *Recording Session Indication* IE is set to “on”, the target eNB shall, if supported, continue the requested trace session and QoE Measurement Collection function as described in TS 36.300 [14].

*Next change*

#### 9.2.1.7 Source eNB to Target eNB Transparent Container

The *Source eNB to target eNB Transparent Container* IE is an information element that is produced by the source eNB and is transmitted to the target eNB. For inter-system handovers to E-UTRAN, the IE is transmitted from the external handover source to the target eNB.

This IE is transparent to the EPC.

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| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| RRC Container | M |  | OCTET STRING | Includes the RRC Handover Preparation Information message as defined in subclause 10.2.2 of TS 36.331 [16]. | - |  |
| **E-RABs Information List** |  | *0..1* |  |  | - |  |
| **>E-RABs Information Item** |  | *1 .. <maxnoof E-RABs>* |  |  | EACH | ignore |
| >>E-RAB ID | M |  | 9.2.1.2 |  | - |  |
| >>DL Forwarding | O |  | 9.2.3.14 |  | - |  |
| Target Cell ID | M |  | E-UTRAN CGI9.2.1.38 |  | - |  |
| Subscriber Profile IDfor RAT/Frequency priority | O |  | 9.2.1.39 |  | - |  |
| UE History Information | M |  | 9.2.1.42 |  | - |  |
| Mobility Information | O |  | BIT STRING (SIZE (32)) | Information related to the handover; the external handover source provides it in order to enable later analysis of the conditions that led to a wrong HO. | YES | ignore |
| UE History Information from the UE | O |  | OCTET STRING | VisitedCellInfoList contained in the UEInformationResponse message (TS 36.331 [16]) | YES | ignore |
| IMS voice EPS fallback from 5G | O |  | ENUMERATED (true, …) |  | YES | ignore |
| Additional RRM Policy Index | O |  | 9.2.1.39a |  | YES | ignore |
| UE Context Reference at Source | O |  | 9.2.1.144 |  | YES | Ignore |
| UE Application layer measurement configuration | O |  | 9.2.1.128 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofE-RABs | Maximum no. of E-RABs for one UE. Value is 256. |

#### 9.2.1.8 Target eNB to Source eNB Transparent Container

The *Target eNB to Source eNB Transparent Container* IE is an information element that is produced by the target eNB and is transmitted to the source eNB. For inter-system handovers to E-UTRAN, the IE is transmitted from the target eNB to the external relocation source.

This IE is transparent to EPC.

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| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| RRC Container | M |  | OCTET STRING | Includes the RRC E-UTRA Handover Command message as defined in subclause 10.2.2 of TS 36.331 [16]. | - |  |
| WithinArea | O |  | ENUMERATED (true, false) | This IE indicates if the target is within the QoE measurement scope. | YES | ignore |

*Next change*

#### 9.2.1.128 UE Application layer measurement configuration

The IE defines configuration information for the QoE Measurement Collection (QMC) function.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Container for application layer measurement configuration | M |  | Octet string (1..1000) | Indicates application layer measurement configuration, see Annex L in [43]. | - | - |
| CHOICE *Area Scope of QMC* | M |  |  |  | - | - |
| >*Cell based* |  |  |  |  |  | - |
| >>**Cell ID List for QMC** |  | *1 .. <maxnoofCellIDforQMC>* |  |  |  | - |
| >>>E-CGI | M |  | 9.2.1.38 |  | - | - |
| >*TA based* |  |  |  |  |  | - |
| >>**TA List for QMC** |  | *1 .. <maxnoofTAforQMC>* |  |  |  | - |
| >>>TAC | M |  | 9.2.3.7 | The TAI is derived using the current serving PLMN. | - | - |
| >*TAI based* |  |  |  |  | - | - |
| >>**TAI List for QMC** |  | *1 .. <maxnoofTAforQMC>* |  |  | - | - |
| >>>TAI | M |  | 9.2.3.16 |  | - | - |
| >*PLMN area based* |  |  |  |  |  | - |
| >>**PLMN List for QMC** |  | *1 .. <maxnoofPLMNforQMC>* |  |  |  | - |
| >>>PLMN Identity | M |  | 9.2.3.8 |  | - | - |
| Service Type | M |  | ENUMERATED(QMC for streaming service, QMC for MTSI service, ...) | This IE indicates the service type of UE application layer measurements. | - | - |
| QMC ID | M |  | OCTET STRING (SIZE(3)) | This IE is used to specify the QoE reference defined as: MCC+MNC+QMC ID(ref. TS 28.405 [x]) | YES | ignore |
| Recording Session Indication | M |  | ENUMERATED (on, off, ...) | This IE indicates if the recording session for the purpose of QoE measurement is ongoing. | YES | ignore |
| **QoE Collection Entity Address List** |  | *1* |  |  | EACH | ignore |
| **>QoE Collection Entity Address List Item IEs** |  | *1 .. <maxnoofPLMNforQMC>* |  |  | YES | ignore |
| >>PLMN Identity | M |  | 9.2.3.8 |  | - |  |
| >>QoE Collection Entity IP Adsdress | M |  | BIT STRING (1..160, ...) | Indicates the IP address to which the QMC records shall be transferred. For details on the Transport Layer Address, see TS 36.424 [8], TS 36.414 [19] | - |  |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofCellIDforQMC | Maximum no. of Cell ID subject for QMC scope. Value is 32. |
| maxnoofTAforQMC | Maximum no. of TA subject for QMC scope. Value is 8. |
| maxnoofPLMNforQMC | Maximum no. of PLMNs in the PLMN list for QMC scope. Value is 16. |

*Start of ASN.1 changes*

### 9.3.4 Information Element Definitions

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

--

-- Information Element Definitions

--

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

S1AP-IEs {

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

eps-Access (21) modules (3) s1ap (1) version1 (1) s1ap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

 id-E-RABInformationListItem,

 id-E-RABItem,

 id-GUMMEIType,

 id-Bearers-SubjectToStatusTransfer-Item,

 id-Time-Synchronisation-Info,

 id-x2TNLConfigurationInfo,

 id-eNBX2ExtendedTransportLayerAddresses,

 id-MDTConfiguration,

 id-Time-UE-StayedInCell-EnhancedGranularity,

 id-HO-Cause,

 id-M3Configuration,

 id-M4Configuration,

 id-M5Configuration,

 id-MDT-Location-Info,

 id-SignallingBasedMDTPLMNList,

 id-MobilityInformation,

 id-ULCOUNTValueExtended,

 id-DLCOUNTValueExtended,

 id-ReceiveStatusOfULPDCPSDUsExtended,

 id-eNBIndirectX2TransportLayerAddresses,

 id-Muting-Availability-Indication,

 id-Muting-Pattern-Information,

 id-NRrestrictioninEPSasSecondaryRAT,

 id-NRrestrictionin5GS,

 id-Synchronisation-Information,

 id-uE-HistoryInformationFromTheUE,

 id-LoggedMBSFNMDT,

 id-SON-Information-Report,

 id-RecommendedCellItem,

 id-RecommendedENBItem,

 id-ProSeUEtoNetworkRelaying,

 id-ULCOUNTValuePDCP-SNlength18,

 id-DLCOUNTValuePDCP-SNlength18,

 id-ReceiveStatusOfULPDCPSDUsPDCP-SNlength18,

 id-M6Configuration,

 id-M7Configuration,

 id-RAT-Type,

 id-extended-e-RAB-MaximumBitrateDL,

 id-extended-e-RAB-MaximumBitrateUL,

 id-extended-e-RAB-GuaranteedBitrateDL,

 id-extended-e-RAB-GuaranteedBitrateUL,

 id-extended-uEaggregateMaximumBitRateDL,

 id-extended-uEaggregateMaximumBitRateUL,

 id-SecondaryRATDataUsageReportItem,

 id-E-RABUsageReportItem,

 id-UEAppLayerMeasConfig,

 id-serviceType,

 id-UnlicensedSpectrumRestriction,

 id-CNTypeRestrictions,

 id-DownlinkPacketLossRate,

 id-UplinkPacketLossRate,

 id-BluetoothMeasurementConfiguration,

 id-WLANMeasurementConfiguration,

 id-LastNG-RANPLMNIdentity,

 id-PSCellInformation,

 id-IMSvoiceEPSfallbackfrom5G,

 id-RequestTypeAdditionalInfo,

 id-AdditionalRRMPriorityIndex,

 id-ContextatSource,

 id-WithinArea,

 id-QMCID,

 id-RecordingSessionIndication,

 id-UEAppLayerMeasConfig,

 id-QoE-Collection-Entity-Address-List,

 id-QoE-Collection-Entity-Address-List-Item,

 id-QoECollectionEntityIPAddress,

 maxnoofCSGs,

 maxnoofE-RABs,

 maxnoofErrors,

 maxnoofBPLMNs,

 maxnoofPLMNsPerMME,

 maxnoofTACs,

 maxnoofEPLMNs,

 maxnoofEPLMNsPlusOne,

 maxnoofForbLACs,

 maxnoofForbTACs,

 maxnoofCellsinUEHistoryInfo,

 maxnoofCellID,

 maxnoofDCNs,

 maxnoofEmergencyAreaID,

 maxnoofTAIforWarning,

 maxnoofCellinTAI,

 maxnoofCellinEAI,

 maxnoofeNBX2TLAs,

 maxnoofeNBX2ExtTLAs,

 maxnoofeNBX2GTPTLAs,

 maxnoofRATs,

 maxnoofGroupIDs,

 maxnoofMMECs,

 maxnoofTAforMDT,

 maxnoofCellIDforMDT,

 maxnoofMDTPLMNs,

 maxnoofCellsforRestart,

 maxnoofRestartTAIs,

 maxnoofRestartEmergencyAreaIDs,

 maxnoofMBSFNAreaMDT,

 maxEARFCN,

 maxnoofCellsineNB,

 maxnoofRecommendedCells,

 maxnoofRecommendedENBs,

 maxnooftimeperiods,

 maxnoofCellIDforQMC,

 maxnoofTAforQMC,

 maxnoofPLMNforQMC,

 maxnoofBluetoothName,

 maxnoofWLANName,

 maxnoofConnectedengNBs

FROM S1AP-Constants

*Next change*

-- Q

QMC-ID ::= OCTET STRING (SIZE (3))

QoE-Collection-Entity-Address-List ::= SEQUENCE (SIZE(1..maxnoofPLMNforQMC)) OF QoE-Collection-Entity-Address-List-Item

QoE-Collection-Entity-Address-List-Item ::= SEQUENCE{

 pLMN-Identity PLMN-Identity,

 qoECollectionEntityIPAddress QoECollectionEntityIPAddress,

 iE-Extensions ProtocolExtensionContainer { { QoE-Collection-Entity-Address-List-Item-ExtIEs} } OPTIONAL

}

QoE-Collection-Entity-Address-List-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 ...

}

QoECollectionEntityIPAddress ::= BIT STRING (SIZE(1..160, ...))

*Next change*

-- R

RecordingSessionIndication ::= ENUMERATED {

 on,

 off,

 ...

}

*Next change*

-- S

SourceeNB-ToTargeteNB-TransparentContainer ::= SEQUENCE {

 rRC-Container RRC-Container,

 e-RABInformationList E-RABInformationList OPTIONAL,

 targetCell-ID EUTRAN-CGI,

 subscriberProfileIDforRFP SubscriberProfileIDforRFP OPTIONAL,

 uE-HistoryInformation UE-HistoryInformation,

 iE-Extensions ProtocolExtensionContainer { {SourceeNB-ToTargeteNB-TransparentContainer-ExtIEs} } OPTIONAL,

 ...

}

SourceeNB-ToTargeteNB-TransparentContainer-ExtIEs S1AP-PROTOCOL-EXTENSION ::= {

 {ID id-MobilityInformation CRITICALITY ignore EXTENSION MobilityInformation PRESENCE optional}|

 {ID id-uE-HistoryInformationFromTheUE CRITICALITY ignore EXTENSION UE-HistoryInformationFromTheUE PRESENCE optional}|

 {ID id-IMSvoiceEPSfallbackfrom5G CRITICALITY ignore EXTENSION IMSvoiceEPSfallbackfrom5G PRESENCE optional}|

 {ID id-AdditionalRRMPriorityIndex CRITICALITY ignore EXTENSION AdditionalRRMPriorityIndex PRESENCE optional}|

 {ID id-ContextatSource CRITICALITY ignore EXTENSION ContextatSource PRESENCE optional}|

 {ID id-UEAppLayerMeasConfig CRITICALITY ignore EXTENSION UEAppLayerMeasConfig PRESENCE optional},

 ...

}

*Next change*

-- T

TargeteNB-ToSourceeNB-TransparentContainer ::= SEQUENCE {

 rRC-Container RRC-Container,

 iE-Extensions ProtocolExtensionContainer { {TargeteNB-ToSourceeNB-TransparentContainer-ExtIEs} } OPTIONAL,

 ...

}

TargeteNB-ToSourceeNB-TransparentContainer-ExtIEs S1AP-PROTOCOL-EXTENSION ::= {

 {ID id-WithinArea CRITICALITY ignore EXTENSION WithinArea PRESENCE optional},

 ...

}

*Next change*

-- U

UEAggregateMaximumBitrate ::= SEQUENCE {

 uEaggregateMaximumBitRateDL BitRate,

 uEaggregateMaximumBitRateUL BitRate,

 iE-Extensions ProtocolExtensionContainer { {UEAggregate-MaximumBitrates-ExtIEs} } OPTIONAL,

 ...

}

UEAggregate-MaximumBitrates-ExtIEs S1AP-PROTOCOL-EXTENSION ::= {

-- Extension for maximum bitrate > 10G bps --

 { ID id-extended-uEaggregateMaximumBitRateDL CRITICALITY ignore EXTENSION ExtendedBitRate PRESENCE optional}|

 { ID id-extended-uEaggregateMaximumBitRateUL CRITICALITY ignore EXTENSION ExtendedBitRate PRESENCE optional},

 ...

}

UEAppLayerMeasConfig ::= SEQUENCE {

 containerForAppLayerMeasConfig OCTET STRING (SIZE(1..1000)),

 areaScopeOfQMC AreaScopeOfQMC,

 iE-Extensions ProtocolExtensionContainer { {UEAppLayerMeasConfig-ExtIEs} } OPTIONAL,

 ...

}

UEAppLayerMeasConfig-ExtIEs S1AP-PROTOCOL-EXTENSION ::= {

 {ID id-serviceType CRITICALITY ignore EXTENSION ServiceType PRESENCE optional}|

 {ID id-QMCID CRITICALITY ignore EXTENSION QMC-ID PRESENCE mandatory}|

 {ID id-RecordingSessionIndication CRITICALITY ignore EXTENSION RecordingSessionIndication PRESENCE mandatory}|

 {ID id-QoE-Collection-Entity-Address-List CRITICALITY ignore EXTENSION QoE-Collection-Entity-Address-List PRESENCE mandatory},

 ...

}

*Next change*

-- W

WithinArea ::= ENUMERATED {

 true,

 false

}

*Next change*

### 9.3.6 Constant Definitions

id-UE-Level-QoS-Parameters ProtocolIE-ID ::= 252

id-DL-CP-SecurityInformation ProtocolIE-ID ::= 253

id-UL-CP-SecurityInformation ProtocolIE-ID ::= 254

id-extended-e-RAB-MaximumBitrateDL ProtocolIE-ID ::= 255

id-extended-e-RAB-MaximumBitrateUL ProtocolIE-ID ::= 256

id-extended-e-RAB-GuaranteedBitrateDL ProtocolIE-ID ::= 257

id-extended-e-RAB-GuaranteedBitrateUL ProtocolIE-ID ::= 258

id-extended-uEaggregateMaximumBitRateDL ProtocolIE-ID ::= 259

id-extended-uEaggregateMaximumBitRateUL ProtocolIE-ID ::= 260

id-NRrestrictioninEPSasSecondaryRAT ProtocolIE-ID ::= 261

id-UEAppLayerMeasConfig ProtocolIE-ID ::= 262

id-UE-Application-Layer-Measurement-Capability ProtocolIE-ID ::= 263

id-SecondaryRATDataUsageReportList ProtocolIE-ID ::= 264

id-SecondaryRATDataUsageReportItem ProtocolIE-ID ::= 265

id-HandoverFlag ProtocolIE-ID ::= 266

id-E-RABUsageReportItem ProtocolIE-ID ::= 267

id-SecondaryRATDataUsageRequest ProtocolIE-ID ::= 268

id-NRUESecurityCapabilities ProtocolIE-ID ::= 269

id-UnlicensedSpectrumRestriction ProtocolIE-ID ::= 270

id-CE-ModeBRestricted ProtocolIE-ID ::= 271

id-LTE-M-Indication ProtocolIE-ID ::= 272

id-DownlinkPacketLossRate ProtocolIE-ID ::= 273

id-UplinkPacketLossRate ProtocolIE-ID ::= 274

id-UECapabilityInfoRequest ProtocolIE-ID ::= 275

id-serviceType ProtocolIE-ID ::= 276

id-AerialUEsubscriptionInformation ProtocolIE-ID ::= 277

id-Subscription-Based-UE-DifferentiationInfo ProtocolIE-ID ::= 278

id-EndIndication ProtocolIE-ID ::= 280

id-EDT-Session ProtocolIE-ID ::= 281

id-CNTypeRestrictions ProtocolIE-ID ::= 282

id-PendingDataIndication ProtocolIE-ID ::= 283

id-BluetoothMeasurementConfiguration ProtocolIE-ID ::= 284

id-WLANMeasurementConfiguration ProtocolIE-ID ::= 285

id-WarningAreaCoordinates ProtocolIE-ID ::= 286

id-NRrestrictionin5GS ProtocolIE-ID ::= 287

id-PSCellInformation ProtocolIE-ID ::= 288

id-LastNG-RANPLMNIdentity ProtocolIE-ID ::= 290

id-ConnectedengNBList ProtocolIE-ID ::= 291

id-ConnectedengNBToAddList ProtocolIE-ID ::= 292

id-ConnectedengNBToRemoveList ProtocolIE-ID ::= 293

id-EN-DCSONConfigurationTransfer-ECT ProtocolIE-ID ::= 294

id-EN-DCSONConfigurationTransfer-MCT ProtocolIE-ID ::= 295

id-IMSvoiceEPSfallbackfrom5G ProtocolIE-ID ::= 296

id-TimeSinceSecondaryNodeRelease ProtocolIE-ID ::= 297

id-RequestTypeAdditionalInfo ProtocolIE-ID ::= 298

id-AdditionalRRMPriorityIndex ProtocolIE-ID ::= 299

id-ContextatSource ProtocolIE-ID ::= 300

id-WithinArea ProtocolIE-ID ::= xx1

id-QMCID ProtocolIE-ID ::= xx2

id-RecordingSessionIndication ProtocolIE-ID ::= xx3id-QoE-Collection-Entity-Address-List ProtocolIE-ID ::= xx4

id-QoE-Collection-Entity-Address-List-Item ProtocolIE-ID ::= xx5

id-QoECollectionEntityIPAddress ProtocolIE-ID ::= xx6

END

*End of ASN.1 change*