**3GPP TSG-RAN3 Meeting #108-e R3-204118**

**June 1st – 12th 2020, Online**

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| --- |
| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **36.423**  | **CR** | **1397** | **rev** | **3** | **Current version:** | **16.1.0** |  |
|  |
| *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:***  | CR TS 36.423 on QoE measurement collection support for X2AP |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | RAN3 |
|  |  |
| ***Work item code:*** | TEI16 |  | ***Date:*** | 2020-05-20 |
|  |  |  |  |  |
| ***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 and LS S5-202304 |
|  |  |
| ***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. |
|  |  |
| ***Clauses affected:*** | 2, 8.2.1.1, 8.2.1.2, 9.1.1.2, 9.2.121, 9.3.4, 9.3.5, 9.3.7 |
|  |  |
|  | **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 36.423 on QoE measurement collection support for X2AP”. Rebased on 36.423 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: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Architecture Description".

[3] 3GPP TS 36.420: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 General Aspects and Principles".

[4] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)".

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

[6] 3GPP TS 32.422: "Telecommunication Management; Subscriber and Equipment Trace; Trace Control and Configuration Management".

[7] 3GPP TS 32.421: "Telecommunication Management; Subscriber and Equipment Trace; Trace concepts and requirements".

[8] 3GPP TS 36.424: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 data transport".

[9] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRAN); Radio Resource Control (RRC) Protocol Specification".

[10] 3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation".

[11] 3GPP TS 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures ".

[12] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

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

[14] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System; Stage 3".

[15] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA), Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; stage 2".

[16] 3GPP TS 36.104: "Base Station (BS) radio transmission and reception ".

[17] Void.

[18] 3GPP TS 33.401: "Security architecture".

[19] 3GPP TS 36.414: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 data transport".

[20] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC)".

[21] 3GPP TS 36.422: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 signaling transport".

[22] 3GPP TS 36.314: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Layer 2 - Measurements".

[23] Void.

[24] 3GPP TS 25.413: "UTRAN Iu interface RANAP signalling"

[25] 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".

[26] 3GPP TS 29.281: "General Packet Radio Service (GPRS); Tunnelling Protocol User Plane (GTPv1-U)".

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

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

[29] 3GPP TS 23.003: "Technical Specification Group Core Network and Terminals; Numbering, addressing and identification".

[30] 3GPP TR 25.921 (version.7.0.0): "Guidelines and principles for protocol description and error handling".

[31] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol Specification".

[32] 3GPP TS 37.340: "Evolved Universal Terrestrial Radio Access (E-UTRA) and NR; Multi-connectivity; Stage 2".

[33] 3GPP TS 38.323: "NR; Packet Data Convergence Protocol (PDCP) specification".

[34] 3GPP TS 38.401: "NG-RAN; Architecture description".

[35] IETF RFC 5905: "Network Time Protocol Version 4: Protocol and Algorithms Specification".

[36] 3GPP TS 26.247: "Transparent end-to-end Packet-switched Streaming Service (PSS); Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH)".

[37] 3GPP TS 38.104: "NR; Base Station (BS) radio transmission and reception".

[38] 3GPP TS 23.501: "System Architecture for the 5G System"

[39] 3GPP TS 38.413: "NG Radio Access Network (NG-RAN); NG Application Protocol (NGAP)".

[40] 3GPP TS 36.322: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Link Control (RLC) protocol specification".

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

*Next change*

### 8.2.1 Handover Preparation

#### 8.2.1.1 General

This procedure is used to establish necessary resources in an eNB for an incoming handover.

The procedure uses UE-associated signalling.

#### 8.2.1.2 Successful Operation



Figure 8.2.1.2-1: Handover Preparation, successful operation

The source eNB initiates the procedure by sending the HANDOVER REQUEST message to the target eNB. When the source eNB sends the HANDOVER REQUEST message, it shall start the timer TRELOCprep.

The allocation of resources according to the values of the *Allocation and Retention Priority* IE included in the *E-RAB Level QoS Parameters* IE shall follow the principles described for the E-RAB Setup procedure in TS 36.413 [4].

The source eNB may include in the *GUMMEI* IE any GUMMEI corresponding to the source MME node.

If at least one of the requested non-GBR E-RABs is admitted to the cell indicated by the *Target Cell ID* IE, the target eNB shall reserve necessary resources, and send the HANDOVER REQUEST ACKNOWLEDGE message back to the source eNB. The target eNB shall include the E-RABs for which resources have been prepared at the target cell in the *E-RABs Admitted List* IE. The target eNB shall include the E-RABs that have not been admitted in the *E-RABs Not Admitted List* IE with an appropriate cause value.

At reception of the HANDOVER REQUEST message the target eNB shall:

- prepare the configuration of the AS security relation between the UE and the target eNB by using the information in the *UE Security Capabilities* IE and the *AS Security Information* IE in the *UE Context Information* IE.

For each E-RAB for which the source eNB proposes to do forwarding of downlink data, the source eNB shall include the *DL Forwarding* IE within the *E-RABs To be Setup Item* IE of the HANDOVER REQUEST message. For each E-RAB that it has decided to admit, the target eNB may include the *DL GTP Tunnel Endpoint* IE within the *E-RABs Admitted Item* IE of the HANDOVER REQUEST ACKNOWLEDGE message to indicate that it accepts the proposed forwarding of downlink data for this bearer. This GTP tunnel endpoint may be different from the corresponding GTP tunnel endpoint, i.e. the information contained in the *Transport Layer address* IE and *GTP TEID* IE in the *E-RAB To Be Switched in Downlink List* IE of the PATH SWITCH REQUEST message (see TS 36.413 [4]) depending on implementation choice.

For each bearer in the *E-RABs Admitted List* IE, the target eNB may include the *UL GTP Tunnel Endpoint* IE to indicate that it requests data forwarding of uplink packets to be performed for that bearer.

Upon reception of the HANDOVER REQUEST ACKNOWLEDGE message the source eNB shall stop the timer TRELOCprep, start the timer TX2RELOCoverall and terminate the Handover Preparation procedure. The source eNB is then defined to have a Prepared Handover for that X2 UE-associated signalling.

If the *Trace Activation* IE is included in the HANDOVER REQUEST message then the target eNB shall, if supported, initiate the requested trace function as described in TS 32.422 [6]. In particular, the target 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 [6];

- 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 [6];

- if the *Trace Activation* IE includes the *MDT Activation* IE, within the *MDT Configuration* IE, set to "Immediate MDT Only" initiate the requested MDT session as described in TS 32.422 [6] 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 *UE Application layer measurement configuration* IE, and if the target eNB is within the QoE measurement area scope and the *Recording Session Indication* IE is set to “off”, initiate the requested trace session and QoE Measurement Collection function as described in TS 36.300 [15].

- if the *Trace Activation* IE includes the *UE Application layer measurement configuration* IE, and if the target eNB is within the QoE measurement area scope and the *Recording Session Indication* IE is set to “on”, continue the ongoing trace session and QoE Measurement Collection function as described in TS 36.300 [15].

- 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].

**>>>>>>>>>>>>>Unhanged parts are skipped<<<<<<<<<<<<<**

*Next change*

#### 9.1.1.2 HANDOVER REQUEST ACKNOWLEDGE

This message is sent by the target eNB to inform the source eNB about the prepared resources at the target.

Direction: target eNB → source eNB.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.2.13 |  | YES | reject |
| Old eNB UE X2AP ID | M |  | eNB UE X2AP ID9.2.24 | Allocated at the source eNB | YES | ignore |
| New eNB UE X2AP ID | M |  | eNB UE X2AP ID9.2.24 | Allocated at the target eNB | YES | ignore |
| **E-RABs Admitted List** |  | *1* |  |  | YES | ignore |
| **>E-RABs Admitted Item** |  | *1 .. <maxnoofBearers>* |  |  | EACH | ignore |
| >>E-RAB ID | M |  | 9.2.23 |  | – |  |
| >>UL GTP Tunnel Endpoint | O |  | GTP Tunnel Endpoint 9.2.1 | Identifies the X2 transport bearer used for forwarding of UL PDUs | – |  |
| >>DL GTP Tunnel Endpoint | O |  | GTP Tunnel Endpoint 9.2.1 | Identifies the X2 transport bearer. used for forwarding of DL PDUs | – |  |
| E-RABs Not Admitted List | O |  | E-RAB List9.2.28 | A value for *E-RAB ID* shall only be present once in*E-RABs Admitted**List* IE and in *E-RABs Not Admitted List* IE. | YES | ignore |
| Target eNB To Source eNB Transparent Container | M |  | OCTET STRING | Includes the RRC E-UTRA Handover Command message as defined in subclause 10.2.2 in TS 36.331 [9] | YES | ignore |
| Criticality Diagnostics | O |  | 9.2.7 |  | YES | ignore |
| UE Context Kept Indicator | O |  | 9.2.85 |  | YES | ignore |
| Old eNB UE X2AP ID Extension | O |  | Extended eNB UE X2AP ID9.2.86 | Allocated at the source eNB | YES | ignore |
| New eNB UE X2AP ID Extension | O |  | Extended eNB UE X2AP ID9.2.86 | Allocated at the target eNB | YES | reject |
| WT UE Context Kept Indicator | O |  | UE Context Kept Indicator9.2.85 | Indicates that the WT has acknowledged to keep the UE context | YES | ignore |
| E-RABs transferred to MeNB | O |  | E-RAB List9.2.28 | In case of EN-DC, indicates that SN Status is needed for the listed E-RABs from the SgNB.. | YES | Ignore |
| Within Area | O |  | ENUMERATED (true, false) | This IE indicates if the target is within the QoE measurement scope | YES | Ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofBearers | Maximum no. of E-RABs. Value is 256 |

*Next change*

### 9.2.121 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 [36]. | - |  |
| 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 Address | 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 PDU Definitions

-- ASN1START

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

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-- PDU definitions for X2AP.

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

X2AP-PDU-Contents {

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

eps-Access (21) modules (3) x2ap (2) version1 (1) x2ap-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

--

-- IE parameter types from other modules.

--

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

IMPORTS

 ABSInformation,

 ABS-Status,

 AS-SecurityInformation,

 BearerType,

 Cause,

 CompositeAvailableCapacityGroup,

 Correlation-ID,

 COUNTvalue,

 CellReportingIndicator,

 AerialUEsubscriptionInformation,

 CriticalityDiagnostics,

 CRNTI,

 CSGMembershipStatus,

 CSG-Id,

 DeactivationIndication,

 DL-Forwarding,

 DynamicDLTransmissionInformation,

 ECGI,

 E-RAB-ID,

 E-RAB-Level-QoS-Parameters,

 E-RAB-List,

 EUTRANTraceID,

 GlobalENB-ID,

 GTPtunnelEndpoint,

 GUGroupIDList,

 GUMMEI,

 HandoverReportType,

 HandoverRestrictionList,

 Masked-IMEISV,

 InvokeIndication,

 LocationReportingInformation,

 LowerLayerPresenceStatusChange,

 MDT-Configuration,

 ManagementBasedMDTallowed,

 MDTPLMNList,

 Neighbour-Information,

 PCI,

 PDCP-SN,

 PLMN-Identity,

 ReceiveStatusofULPDCPSDUs,

 Registration-Request,

 RelativeNarrowbandTxPower,

 RadioResourceStatus,

 RLC-Status,

 RRCConnReestabIndicator,

 RRCConnSetupIndicator,

 UE-RLF-Report-Container,

 UEAppLayerMeasConfig,

 RRC-Context,

 ServedCell-Information,

 ServedCells,

 ShortMAC-I,

 SRVCCOperationPossible,

 SubscriberProfileIDforRFP,

 TargetCellInUTRAN,

 TargeteNBtoSource-eNBTransparentContainer,

 TimeToWait,

 TraceActivation,

 TraceDepth,

 TransportLayerAddress,

 UEAggregateMaximumBitRate,

 UE-HistoryInformation,

 UE-HistoryInformationFromTheUE,

 UE-S1AP-ID,

 UESecurityCapabilities,

 UEsToBeResetList,

 UE-X2AP-ID,

 UL-HighInterferenceIndicationInfo,

 UL-InterferenceOverloadIndication,

 HWLoadIndicator,

 S1TNLLoadIndicator,

 Measurement-ID,

 ReportCharacteristics,

 MobilityParametersInformation,

 MobilityParametersModificationRange,

 ReceiveStatusOfULPDCPSDUsExtended,

 COUNTValueExtended,

 SubframeAssignment,

 ExtendedULInterferenceOverloadInfo,

 ExpectedUEBehaviour,

 SeNBSecurityKey,

 MeNBtoSeNBContainer,

 SeNBtoMeNBContainer,

 SCGChangeIndication,

 CoMPInformation,

 ReportingPeriodicityRSRPMR,

 RSRPMRList,

 UE-RLF-Report-Container-for-extended-bands,

 ProSeAuthorized,

 CoverageModificationList,

 ReportingPeriodicityCSIR,

 CSIReportList,

 ReceiveStatusOfULPDCPSDUsPDCP-SNlength18,

 COUNTvaluePDCP-SNlength18,

 LHN-ID,

 UE-ContextKeptIndicator,

 UE-X2AP-ID-Extension,

 SIPTOBearerDeactivationIndication,

 TunnelInformation,

 V2XServicesAuthorized,

 X2BenefitValue,

 ResumeID,

 EUTRANCellIdentifier,

 MakeBeforeBreakIndicator,

 WTID,

 WT-UE-XwAP-ID,

 UESidelinkAggregateMaximumBitRate,

 SgNBSecurityKey,

 MeNBtoSgNBContainer,

 SgNBtoMeNBContainer,

 SplitSRBs,

 RRCContainer,

 SRBType,

 GlobalGNB-ID,

 GNB-ID,

 SCGConfigurationQuery,

 SplitSRB,

 NRUeReport,

 EN-DC-ResourceConfiguration,

 TAC,

 NRFreqInfo,

 NRCGI,

 NRPCI,

 NRUESecurityCapabilities,

 PDCPChangeIndication,

 ULConfiguration,

 SgNB-UE-X2AP-ID,

 SecondaryRATUsageReportList,

 ActivationID,

 MeNBResourceCoordinationInformation,

 SgNBResourceCoordinationInformation,

 NR-TxBW,

 BroadcastPLMNs-Item,

 AdditionalPLMNs-Item,

 RLCMode,

 GBR-QosInformation,

 DRB-ID,

 FiveGS-TAC,

 SULInformation,

 Packet-LossRate,

 ResourceType,

 DataTrafficResourceIndication,

 SpectrumSharingGroupID,

 RRC-Config-Ind,

 SGNB-Addition-Trigger-Ind,

 UserPlaneTrafficActivityReport,

 ERABActivityNotifyItemList,

 PDCPSnLength,

 Subscription-Based-UE-DifferentiationInfo,

 LCID,

 DuplicationActivation,

 GNBOverloadInformation,

 NewDRBIDrequest,

 DesiredActNotificationLevel,

 LocationInformationSgNB,

 LocationInformationSgNBReporting,

 EndcSONConfigurationTransfer,

 NRNeighbour-Information,

 InterfaceInstanceIndication,

 BPLMN-ID-Info-NR,

 EPCHandoverRestrictionListContainer,

 AdditionalRRMPriorityIndex,

 RequestedFastMCGRecoveryViaSRB3,

 AvailableFastMCGRecoveryViaSRB3,

 RequestedFastMCGRecoveryViaSRB3Release,

 ReleaseFastMCGRecoveryViaSRB3,

 FastMCGRecovery,

 PartialListIndicator,

 MaximumCellListSize,

 MessageOversizeNotification,

 TNLConfigurationInfo,

 TNLA-To-Add-List,

 TNLA-To-Update-List,

 TNLA-To-Remove-List,

 TNLA-Setup-List,

 TNLA-Failed-To-Setup-List,

 RAN-UE-NGAP-ID

FROM X2AP-IEs

 PrivateIE-Container{},

 ProtocolExtensionContainer{},

 ProtocolIE-Container{},

 ProtocolIE-ContainerList{},

 ProtocolIE-ContainerPair{},

 ProtocolIE-ContainerPairList{},

 ProtocolIE-Single-Container{},

 X2AP-PRIVATE-IES,

 X2AP-PROTOCOL-EXTENSION,

 X2AP-PROTOCOL-IES,

 X2AP-PROTOCOL-IES-PAIR

FROM X2AP-Containers

 id-ABSInformation,

 id-ActivatedCellList,

 id-BearerType,

 id-Cause,

 id-CellInformation,

 id-CellInformation-Item,

 id-CellMeasurementResult,

 id-CellMeasurementResult-Item,

 id-CellToReport,

 id-CellToReport-Item,

 id-CompositeAvailableCapacityGroup,

 id-AerialUEsubscriptionInformation,

 id-CriticalityDiagnostics,

 id-DeactivationIndication,

 id-DynamicDLTransmissionInformation,

 id-E-RABs-Admitted-Item,

 id-E-RABs-Admitted-List,

 id-E-RABs-NotAdmitted-List,

 id-E-RABs-SubjectToStatusTransfer-List,

 id-E-RABs-SubjectToStatusTransfer-Item,

 id-E-RABs-ToBeSetup-Item,

 id-GlobalENB-ID,

 id-GUGroupIDList,

 id-GUGroupIDToAddList,

 id-GUGroupIDToDeleteList,

 id-GUMMEI-ID,

 id-Masked-IMEISV,

 id-InvokeIndication,

 id-New-eNB-UE-X2AP-ID,

 id-Old-eNB-UE-X2AP-ID,

 id-Registration-Request,

 id-ReportingPeriodicity,

 id-RLC-Status,

 id-ServedCells,

 id-ServedCellsToActivate,

 id-ServedCellsToAdd,

 id-ServedCellsToModify,

 id-ServedCellsToDelete,

 id-SRVCCOperationPossible,

 id-TargetCell-ID,

 id-TargeteNBtoSource-eNBTransparentContainer,

 id-TimeToWait,

 id-TraceActivation,

 id-UE-ContextInformation,

 id-UE-HistoryInformation,

 id-UE-X2AP-ID,

 id-Measurement-ID,

 id-ReportCharacteristics,

 id-ENB1-Measurement-ID,

 id-ENB2-Measurement-ID,

 id-ENB1-Cell-ID,

 id-ENB2-Cell-ID,

 id-ENB2-Proposed-Mobility-Parameters,

 id-ENB1-Mobility-Parameters,

 id-ENB2-Mobility-Parameters-Modification-Range,

 id-FailureCellPCI,

 id-Re-establishmentCellECGI,

 id-FailureCellCRNTI,

 id-ShortMAC-I,

 id-SourceCellECGI,

 id-FailureCellECGI,

 id-HandoverReportType,

 id-UE-RLF-Report-Container,

 id-PartialSuccessIndicator,

 id-MeasurementInitiationResult-List,

 id-MeasurementInitiationResult-Item,

 id-MeasurementFailureCause-Item,

 id-CompleteFailureCauseInformation-List,

 id-CompleteFailureCauseInformation-Item,

 id-CSGMembershipStatus,

 id-CSG-Id,

 id-MDTConfiguration,

 id-ManagementBasedMDTallowed,

 id-ABS-Status,

 id-RRCConnSetupIndicator,

 id-RRCConnReestabIndicator,

 id-TargetCellInUTRAN,

 id-MobilityInformation,

 id-SourceCellCRNTI,

 id-ManagementBasedMDTPLMNList,

 id-ReceiveStatusOfULPDCPSDUsExtended,

 id-ULCOUNTValueExtended,

 id-DLCOUNTValueExtended,

 id-IntendedULDLConfiguration,

 id-ExtendedULInterferenceOverloadInfo,

 id-RNL-Header,

 id-x2APMessage,

 id-UE-HistoryInformationFromTheUE,

 id-ExpectedUEBehaviour,

 id-MeNB-UE-X2AP-ID,

 id-SeNB-UE-X2AP-ID,

 id-UE-SecurityCapabilities,

 id-SeNBSecurityKey,

 id-SeNBUEAggregateMaximumBitRate,

 id-ServingPLMN,

 id-E-RABs-ToBeAdded-List,

 id-E-RABs-ToBeAdded-Item,

 id-MeNBtoSeNBContainer,

 id-E-RABs-Admitted-ToBeAdded-List,

 id-E-RABs-Admitted-ToBeAdded-Item,

 id-SeNBtoMeNBContainer,

 id-ResponseInformationSeNBReconfComp,

 id-UE-ContextInformationSeNBModReq,

 id-E-RABs-ToBeAdded-ModReqItem,

 id-E-RABs-ToBeModified-ModReqItem,

 id-E-RABs-ToBeReleased-ModReqItem,

 id-E-RABs-Admitted-ToBeAdded-ModAckList,

 id-E-RABs-Admitted-ToBeModified-ModAckList,

 id-E-RABs-Admitted-ToBeReleased-ModAckList,

 id-E-RABs-Admitted-ToBeAdded-ModAckItem,

 id-E-RABs-Admitted-ToBeModified-ModAckItem,

 id-E-RABs-Admitted-ToBeReleased-ModAckItem,

 id-SCGChangeIndication,

 id-E-RABs-ToBeReleased-ModReqd,

 id-E-RABs-ToBeReleased-ModReqdItem,

 id-E-RABs-ToBeReleased-List-RelReq,

 id-E-RABs-ToBeReleased-RelReqItem,

 id-E-RABs-ToBeReleased-List-RelConf,

 id-E-RABs-ToBeReleased-RelConfItem,

 id-E-RABs-SubjectToCounterCheck-List,

 id-E-RABs-SubjectToCounterCheckItem,

 id-CoMPInformation,

 id-ReportingPeriodicityRSRPMR,

 id-RSRPMRList,

 id-UE-RLF-Report-Container-for-extended-bands,

 id-ProSeAuthorized,

 id-CoverageModificationList,

 id-ReportingPeriodicityCSIR,

 id-CSIReportList,

 id-ReceiveStatusOfULPDCPSDUsPDCP-SNlength18,

 id-ULCOUNTValuePDCP-SNlength18,

 id-DLCOUNTValuePDCP-SNlength18,

 id-LHN-ID,

 id-Correlation-ID,

 id-SIPTO-Correlation-ID,

 id-UE-ContextReferenceAtSeNB,

 id-UE-ContextReferenceAtWT,

 id-UE-ContextKeptIndicator,

 id-UEs-ToBeReset,

 id-UEs-Admitted-ToBeReset,

 id-WT-UE-ContextKeptIndicator,

 id-New-eNB-UE-X2AP-ID-Extension,

 id-Old-eNB-UE-X2AP-ID-Extension,

 id-MeNB-UE-X2AP-ID-Extension,

 id-SeNB-UE-X2AP-ID-Extension,

 id-SIPTO-BearerDeactivationIndication,

 id-Tunnel-Information-for-BBF,

 id-SIPTO-L-GW-TransportLayerAddress,

 id-GW-TransportLayerAddress,

 id-X2RemovalThreshold,

 id-CellReportingIndicator,

 id-V2XServicesAuthorized,

 id-resumeID,

 id-UE-ContextInformationRetrieve,

 id-E-RABs-ToBeSetupRetrieve-Item,

 id-NewEUTRANCellIdentifier,

 id-MakeBeforeBreakIndicator,

 id-UESidelinkAggregateMaximumBitRate,

 id-uL-GTPtunnelEndpoint,

 id-SgNBSecurityKey,

 id-SgNBUEAggregateMaximumBitRate,

 id-E-RABs-ToBeAdded-SgNBAddReqList,

 id-MeNBtoSgNBContainer,

 id-SgNB-UE-X2AP-ID,

 id-RequestedSplitSRBs,

 id-E-RABs-ToBeAdded-SgNBAddReq-Item,

 id-E-RABs-Admitted-ToBeAdded-SgNBAddReqAckList,

 id-SgNBtoMeNBContainer,

 id-AdmittedSplitSRBs,

 id-E-RABs-Admitted-ToBeAdded-SgNBAddReqAck-Item,

 id-ResponseInformationSgNBReconfComp,

 id-UE-ContextInformation-SgNBModReq,

 id-E-RABs-ToBeAdded-SgNBModReq-Item,

 id-E-RABs-ToBeModified-SgNBModReq-Item,

 id-E-RABs-ToBeReleased-SgNBModReq-Item,

 id-E-RABs-Admitted-ToBeAdded-SgNBModAckList,

 id-E-RABs-Admitted-ToBeModified-SgNBModAckList,

 id-E-RABs-Admitted-ToBeReleased-SgNBModAckList,

 id-E-RABs-Admitted-ToBeAdded-SgNBModAck-Item,

 id-E-RABs-Admitted-ToBeModified-SgNBModAck-Item,

 id-E-RABs-Admitted-ToBeReleased-SgNBModAck-Item,

 id-E-RABs-Admitted-ToBeReleased-SgNBRelReqAckList,

 id-E-RABs-Admitted-ToBeReleased-SgNBRelReqAck-Item,

 id-E-RABs-ToBeReleased-SgNBModReqdList,

 id-E-RABs-ToBeModified-SgNBModReqdList,

 id-E-RABs-ToBeReleased-SgNBModReqd-Item,

 id-E-RABs-ToBeModified-SgNBModReqd-Item,

 id-E-RABs-ToBeReleased-SgNBChaConfList,

 id-E-RABs-ToBeReleased-SgNBChaConf-Item,

 id-E-RABs-ToBeReleased-SgNBRelReqList,

 id-E-RABs-ToBeReleased-SgNBRelReq-Item,

 id-E-RABs-ToBeReleased-SgNBRelConfList,

 id-E-RABs-ToBeReleased-SgNBRelConf-Item,

 id-E-RABs-ToBeReleased-SgNBRelReqdList,

 id-E-RABs-ToBeReleased-SgNBRelReqd-Item,

 id-E-RABs-SubjectToSgNBCounterCheck-List,

 id-E-RABs-SubjectToSgNBCounterCheck-Item,

 id-Target-SgNB-ID,

 id-RRCContainer,

 id-SRBType,

 id-HandoverRestrictionList,

 id-SCGConfigurationQuery,

 id-SplitSRB,

 id-NRUeReport,

 id-InitiatingNodeType-EndcX2Setup,

 id-InitiatingNodeType-EndcConfigUpdate,

 id-RespondingNodeType-EndcX2Setup,

 id-RespondingNodeType-EndcConfigUpdate,

 id-NRUESecurityCapabilities,

 id-PDCPChangeIndication,

 id-ServedEUTRAcellsENDCX2ManagementList,

 id-ServedEUTRAcellsToModifyListENDCConfUpd,

 id-ServedEUTRAcellsToDeleteListENDCConfUpd,

 id-ServedNRcellsToModifyListENDCConfUpd,

 id-ServedNRcellsToDeleteListENDCConfUpd,

 id-CellAssistanceInformation,

 id-Globalen-gNB-ID,

 id-ServedNRcellsENDCX2ManagementList,

 id-Old-SgNB-UE-X2AP-ID,

 id-UE-ContextReferenceAtSgNB,

 id-SecondaryRATUsageReportList,

 id-ActivationID,

 id-ServedNRCellsToActivate,

 id-ActivatedNRCellList,

 id-MeNBResourceCoordinationInformation,

 id-SgNBResourceCoordinationInformation,

 id-UEAppLayerMeasConfig,

 id-SelectedPLMN,

 id-SubscriberProfileIDforRFP,

 id-InitiatingNodeType-EutranrCellResourceCoordination,

 id-RespondingNodeType-EutranrCellResourceCoordination,

 id-DataTrafficResourceIndication,

 id-SpectrumSharingGroupID,

 id-ListofEUTRACellsinEUTRACoordinationReq,

 id-ListofEUTRACellsinEUTRACoordinationResp,

 id-ListofEUTRACellsinNRCoordinationReq,

 id-ListofNRCellsinNRCoordinationReq,

 id-ListofNRCellsinNRCoordinationResp,

 id-RRCConfigIndication,

 id-SGNB-Addition-Trigger-Ind,

 id-RequestedSplitSRBsrelease,

 id-AdmittedSplitSRBsrelease,

 id-E-RABs-AdmittedToBeModified-SgNBModConfList,

 id-E-RABs-AdmittedToBeModified-SgNBModConf-Item,

 id-UEContextLevelUserPlaneActivity,

 id-ERABActivityNotifyItemList,

 id-MeNBCell-ID,

 id-InitiatingNodeType-EndcX2Removal,

 id-RespondingNodeType-EndcX2Removal,

 id-uLpDCPSnLength,

 id-dL-Forwarding,

 id-E-RABs-DataForwardingAddress-List,

 id-E-RABs-DataForwardingAddress-Item,

 id-Subscription-Based-UE-DifferentiationInfo,

 id-RLCMode-transferred,

 id-dLPDCPSnLength,

 id-secondarysgNBDLGTPTEIDatPDCP,

 id-secondarymeNBULGTPTEIDatPDCP,

 id-lCID,

 id-duplicationActivation,

 id-GNBOverloadInformation,

 id-new-drb-ID-req,

 id-NRNeighbourInfoToModify,

 id-DesiredActNotificationLevel,

 id-LocationInformationSgNB,

 id-LocationInformationSgNBReporting,

 id-endcSONConfigurationTransfer,

 id-EUTRANTraceID,

 id-additionalPLMNs-Item,

 id-InterfaceInstanceIndication,

 id-BPLMN-ID-Info-NR,

 id-EPCHandoverRestrictionListContainer,

 id-ERABs-transferred-to-MeNB,

 id-AdditionalRRMPriorityIndex,

 id-LowerLayerPresenceStatusChange,

 id-FastMCGRecovery-SN-to-MN,

 id-FastMCGRecovery-MN-to-SN,

 id-RequestedFastMCGRecoveryViaSRB3,

 id-AvailableFastMCGRecoveryViaSRB3,

 id-RequestedFastMCGRecoveryViaSRB3Release,

 id-ReleaseFastMCGRecoveryViaSRB3,

 id-PartialListIndicator,

 id-MaximumCellListSize,

 id-MessageOversizeNotification,

 id-CellandCapacityAssistInfo,

 id-TNLConfigurationInfo,

 id-TNLA-To-Add-List,

 id-TNLA-To-Update-List,

 id-TNLA-To-Remove-List,

 id-TNLA-Setup-List,

 id-TNLA-Failed-To-Setup-List,

 id-UEContextReferenceatSourceNGRAN,

 id-WithinArea,

 maxCellineNB,

 maxnoofBearers,

 maxnoofPDCP-SN,

 maxFailedMeasObjects,

 maxnoofCellIDforMDT,

 maxnoofTAforMDT,

 maxCellinengNB,

 maxnoofCellIDforQMC,

 maxnoofTAforQMC,

 maxnoofPLMNforQMC,

 maxnoofProtectedResourcePatterns,

 maxnoNRcellsSpectrumSharingWithE-UTRA,

 maxnoofNrCellBands

FROM X2AP-Constants;

FROM X2AP-Constants;

*Next change*

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

--

-- HANDOVER REQUEST ACKNOWLEDGE

--

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

HandoverRequestAcknowledge ::= SEQUENCE {

 protocolIEs ProtocolIE-Container {{HandoverRequestAcknowledge-IEs}},

 ...

}

HandoverRequestAcknowledge-IEs X2AP-PROTOCOL-IES ::= {

 { ID id-Old-eNB-UE-X2AP-ID CRITICALITY ignore TYPE UE-X2AP-ID PRESENCE mandatory}|

 { ID id-New-eNB-UE-X2AP-ID CRITICALITY ignore TYPE UE-X2AP-ID PRESENCE mandatory}|

 { ID id-E-RABs-Admitted-List CRITICALITY ignore TYPE E-RABs-Admitted-List PRESENCE mandatory}|

 { ID id-E-RABs-NotAdmitted-List CRITICALITY ignore TYPE E-RAB-List PRESENCE optional}|

 { ID id-TargeteNBtoSource-eNBTransparentContainer CRITICALITY ignore TYPE TargeteNBtoSource-eNBTransparentContainer PRESENCE mandatory}|

 { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional}|

 { ID id-UE-ContextKeptIndicator CRITICALITY ignore TYPE UE-ContextKeptIndicator PRESENCE optional}|

 { ID id-SeNB-UE-X2AP-ID-Extension CRITICALITY ignore TYPE UE-X2AP-ID-Extension PRESENCE optional}-- The id-SeNB-UE-X2AP-ID-Extension shall not be sent and shall be ignored, if received.--|

 { ID id-Old-eNB-UE-X2AP-ID-Extension CRITICALITY ignore TYPE UE-X2AP-ID-Extension PRESENCE optional}|

 { ID id-New-eNB-UE-X2AP-ID-Extension CRITICALITY reject TYPE UE-X2AP-ID-Extension PRESENCE optional}|

 { ID id-WT-UE-ContextKeptIndicator CRITICALITY ignore TYPE UE-ContextKeptIndicator PRESENCE optional}|

 { ID id-ERABs-transferred-to-MeNB CRITICALITY ignore TYPE E-RAB-List PRESENCE optional}|

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

 ...

}

E-RABs-Admitted-List ::= SEQUENCE (SIZE (1..maxnoofBearers)) OF ProtocolIE-Single-Container { {E-RABs-Admitted-ItemIEs} }

E-RABs-Admitted-ItemIEs X2AP-PROTOCOL-IES ::= {

 { ID id-E-RABs-Admitted-Item CRITICALITY ignore TYPE E-RABs-Admitted-Item PRESENCE mandatory }

}

E-RABs-Admitted-Item ::= SEQUENCE {

 e-RAB-ID E-RAB-ID,

 uL-GTP-TunnelEndpoint GTPtunnelEndpoint OPTIONAL,

 dL-GTP-TunnelEndpoint GTPtunnelEndpoint OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { {E-RABs-Admitted-Item-ExtIEs} } OPTIONAL,

 ...

}

E-RABs-Admitted-Item-ExtIEs X2AP-PROTOCOL-EXTENSION ::= {

 ...

}

WithinArea ::= ENUMERATED {

 true,

 false

}

*Next change*

### 9.3.5 Information Element definitions

-- ASN1START

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

--

-- Information Element Definitions

--

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

X2AP-IEs {

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

eps-Access (21) modules (3) x2ap (2) version1 (1) x2ap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

 id-E-RAB-Item,

 id-Number-of-Antennaports,

 id-MBSFN-Subframe-Info,

 id-PRACH-Configuration,

 id-CSG-Id,

 id-MDTConfiguration,

 id-SignallingBasedMDTPLMNList,

 id-MultibandInfoList,

 id-FreqBandIndicatorPriority,

 id-NeighbourTAC,

 id-Time-UE-StayedInCell-EnhancedGranularity,

 id-MBMS-Service-Area-List,

 id-HO-cause,

 id-eARFCNExtension,

 id-DL-EARFCNExtension,

 id-UL-EARFCNExtension,

 id-M3Configuration,

 id-M4Configuration,

 id-M5Configuration,

 id-MDT-Location-Info,

 id-NRrestrictioninEPSasSecondaryRAT,

 id-NRrestrictionin5GS,

 id-AdditionalSpecialSubframe-Info,

 id-UEID,

 id-enhancedRNTP,

 id-ProSeUEtoNetworkRelaying,

 id-M6Configuration,

 id-M7Configuration,

 id-OffsetOfNbiotChannelNumberToDL-EARFCN,

 id-OffsetOfNbiotChannelNumberToUL-EARFCN,

 id-AdditionalSpecialSubframeExtension-Info,

 id-BandwidthReducedSI,

 id-extended-e-RAB-MaximumBitrateDL,

 id-extended-e-RAB-MaximumBitrateUL,

 id-extended-e-RAB-GuaranteedBitrateDL,

 id-extended-e-RAB-GuaranteedBitrateUL,

 id-extended-uEaggregateMaximumBitRateDownlink,

 id-extended-uEaggregateMaximumBitRateUplink,

 id-E-RABUsageReport-Item,

 id-SecondaryRATUsageReport-Item,

 id-UEAppLayerMeasConfig,

 id-DL-scheduling-PDCCH-CCE-usage,

 id-UL-scheduling-PDCCH-CCE-usage,

 id-DownlinkPacketLossRate,

 id-UplinkPacketLossRate,

 id-serviceType,

 id-ProtectedEUTRAResourceIndication,

 id-NRS-NSSS-PowerOffset,

 id-NSSS-NumOccasionDifferentPrecoder,

 id-CNTypeRestrictions,

 id-BluetoothMeasurementConfiguration,

 id-WLANMeasurementConfiguration,

 id-ECGI,

 id-NRCGI,

 id-MeNBCoordinationAssistanceInformation,

 id-SgNBCoordinationAssistanceInformation,

 id-NRNeighbourInfoToAdd,

 id-LastNG-RANPLMNIdentity,

 id-BPLMN-ID-Info-EUTRA,

 id-NBIoT-UL-DL-AlignmentOffset,

 id-UnlicensedSpectrumRestriction,

 id-QMCID,

 id-RecordingSessionIndication,

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

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

 id-QoECollectionEntityIPAddress,

 maxnoofBearers,

 maxCellineNB,

 maxEARFCN,

 maxEARFCNPlusOne,

 newmaxEARFCN,

 maxInterfaces,

 maxnoofBands,

 maxnoofBPLMNs,

 maxnoofAdditionalPLMNs,

 maxnoofCells,

 maxnoofEPLMNs,

 maxnoofEPLMNsPlusOne,

 maxnoofForbLACs,

 maxnoofForbTACs,

 maxnoofNeighbours,

 maxnoofPRBs,

 maxNrOfErrors,

 maxPools,

 maxnoofMBSFN,

 maxnoofTAforMDT,

 maxnoofCellIDforMDT,

 maxnoofMBMSServiceAreaIdentities,

 maxnoofMDTPLMNs,

 maxnoofCoMPHypothesisSet,

 maxnoofCoMPCells,

 maxUEReport,

 maxCellReport,

 maxnoofPA,

 maxCSIProcess,

 maxCSIReport,

 maxSubband,

 maxnooftimeperiods,

 maxnoofCellIDforQMC,

 maxnoofTAforQMC,

 maxnoofPLMNforQMC,

 maxUEsinengNBDU,

 maxnoofProtectedResourcePatterns,

 maxnoNRcellsSpectrumSharingWithE-UTRA,

 maxnoofNrCellBands,

 maxnoofBluetoothName,

 maxnoofWLANName,

 maxofNRNeighbours,

 maxnoofextBPLMNs,

 maxnoofextBPLMNsminus1,

 maxnoofBPLMNsminus1,

 maxnoofTLAs,

 maxnoofGTPTLAs,

 maxnoofTNLAssociations

FROM X2AP-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, ...))

-- R

RecordingSessionIndication ::= ENUMERATED {

 on,

 off,

 ...

}

-- U

UEAggregateMaximumBitRate ::= SEQUENCE {

 uEaggregateMaximumBitRateDownlink BitRate,

 uEaggregateMaximumBitRateUplink BitRate,

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

 ...

}

UEAggregate-MaximumBitrate-ExtIEs X2AP-PROTOCOL-EXTENSION ::= {

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

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

 ...

}

UEAppLayerMeasConfig ::= SEQUENCE {

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

 areaScopeOfQMC AreaScopeOfQMC,

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

 ...

}

UEAppLayerMeasConfig-ExtIEs X2AP-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 },

 ...

}

UE-ContextKeptIndicator ::= ENUMERATED {

 true,

 ...

}

*Next change*

### 9.3.7 Constant definitions

 ProtocolIE-ID ::= 347

id-PartialListIndicator ProtocolIE-ID ::= 348

id-MaximumCellListSize ProtocolIE-ID ::= 349

id-MessageOversizeNotification ProtocolIE-ID ::= 350

id-CellandCapacityAssistInfo ProtocolIE-ID ::= 351

id-TNLConfigurationInfo ProtocolIE-ID ::= 352

id-TNLA-To-Add-List ProtocolIE-ID ::= 353

id-TNLA-To-Update-List ProtocolIE-ID ::= 354

id-TNLA-To-Remove-List ProtocolIE-ID ::= 355

id-TNLA-Setup-List ProtocolIE-ID ::= 356

id-TNLA-Failed-To-Setup-List ProtocolIE-ID ::= 357

id-UnlicensedSpectrumRestriction ProtocolIE-ID ::= 358

id-UEContextReferenceatSourceNGRAN ProtocolIE-ID ::= 359

id-EPCHandoverRestrictionListContainer ProtocolIE-ID ::= 360

id-WithinArea ProtocolIE-ID ::= xx1

id-QMCID ProtocolIE-ID ::= xx2

id-RecordingSessionIndication ProtocolIE-ID ::= xx3

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

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

id-QoECollectionEntityIPAddress ProtocolIE-ID ::= xx6

END

-- ASN1STOP

*End of ASN.1 changes*