**3GPP TSG-RAN WG3 Meeting #124R3-243854**

**20th May- 24th May 2024, Fukuoka, Japan**

|  |
| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.413** | **CR** | **1171** | **rev** | **1** | **Current version:** | **18.1.0** |  |
|  |
| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm%22%20%5Cl%20%22_blank)******[LP](http://www.3gpp.org/3G_Specs/CRs.htm%22%20%5Cl%20%22_blank)*** *on using this form: comprehensive instructions can be found at <http://www.3gpp.org/Change-Requests>.* |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network | **X** |

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|  |
| ***Title:***  | Correction on NGAP to support the QoE mobility during NG-based inter-MN HO |
|  |  |
| ***Source to WG:*** | ZTE, China Unicom, China Telecom, CMCC, Samsung, CATT, Ericsson |
| ***Source to TSG:*** | R3  |
|  |  |
| ***Work item code:*** | NR\_QoE\_enh-Core |  | ***Date:*** | 2024-05-23 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories 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-17 (Release 17)Rel-18 (Release 18)**Rel-19 (Release 19)**Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | The continuity of QoE measurement collection in NR-DC scenario was discussed in Rel-18, but only XnAP signalling is enhanced to support it. However, when inter-MN HO happens, the NGAP HO messages could also be used to forward the QMC configuration information from the source MN to the target MN (via AMF). Specifically, *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE is used to forward the information to the target MN transparently. So, we believe the *Source SN to Target SN QMC Information* IE should be added in this NGAP container, to support the NG-based inter-MN handover, for the continuity of QMC in NR-DC.To support the continuity of QMC in dual connectivity, the QoE and RVQoE reporting path shall also be passed to the target MN, similar as in XnAP. So, the QoE and RVQoE reporting paths IE shall be added into the QMC configuration, so that it could be sent in the source to target transparent container during NG-based HO. |
|  |  |
| ***Summary of change:*** | 1. Add *Source SN to Target SN QMC Information* IE in the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE of NGAP.
2. Add *QoE and RVQoE Reporting Paths* IE in the UE Application Layer Measurement Configuration Information.

Impact assessment towards the previous version of the specification (same release):This CR has an isolated impact towards the previous version of the specification (same release).This CR only has an impact on the NR QoE functions. |
|  |  |
| ***Consequences if not approved:*** | The continuity of QMC during NG-based inter-MN HO is not supported.  |
|  |  |
| ***Clauses affected:*** | 8.4.2.2, 9.3.1.29, 9.3.1.224, 9.3.1.x1 (new), 9.4.4, 9.4.5, 9.4.7 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/CR ...CR...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | R1: Revised based on the discussion during RAN3#124. |

*Changes Start*

### **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 NG-RAN node for the handover of a UE. The procedure uses UE-associated signalling.

#### **8.4.2.2 Successful Operation**



Figure 8.4.2.2-1: Handover resource allocation: successful operation

The AMF initiates the procedure by sending the HANDOVER REQUEST message to the target NG-RAN node.

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

Upon receipt of the HANDOVER REQUEST message the target NG-RAN node shall

- attempt to execute the requested PDU session configuration and associated security;

- store the received UE Aggregate Maximum Bit Rate in the UE context, and use the received UE Aggregate Maximum Bit Rate for all Non-GBR QoS flows for the concerned UE as specified in TS 23.501 [9];

- store the received Mobility Restriction List in the UE context;

- store the received UE Security Capabilities in the UE context;

- store the received Security Context in the UE context and take it into use as defined in TS 33.501 [13];

- if supported, store the received UE Slice Maximum Bit Rate List in the UE context and use the received UE Slice Maximum Bit Rate List for each S-NSSAI for the concerned UE as specified in TS 23.501 [9].

- if supported, store the received PDU Set QoS parameters in the UE context and use it as specified in TS 23.501 [9].

<unchanged text omitted>

If the HANDOVER REQUEST message contains within the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE the *Time Based Handover Information* IE, the target NG-RAN node may use this information to allocate necessary resources for the incoming handover.

If the *Candidate Relay UE* *Information List* IE is included in the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE within the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, use it to configure the path switch to indirect path as specified in TS 38.300 [8].

If the *QMC Configuration Information* IE is included in the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE within the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, take it into account for QoE management handling, as described in TS 38.300 [8].

If the *Source SN to Target SN QMC Information* IE is included in the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE within the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, take it into account for QoE management handling, as described in TS 37.340 [32].

If the *Aerial UE Subscription Information* IE is included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 38.300 [8].

If the *PNI-NPN Area Scope of MDT* IE is included in the *MDT Configuration-NR* IE included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, use it to derive the MDT area scope for MDT measurement collection in PNI-NPN areas. Upon reception of the *PNI-NPN Area Scope of MDT* IE, the NG-RAN node shall consider that the area scope for MDT measurement collection in PNI-NPN areas is defined only by the areas included in the *PNI-NPN Area Scope of MDT* IE.

If the *Partially Allowed NSSAI* IE is contained in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, deduce from it the partially allowed network slices for the UE, store and replace any previously received Partially Allowed NSSAI and use it as specified in TS 23.501 [9].

If the *MBS Support Indicator* IE is included in the *Handover Request Acknowledge Transfer* IE in the HANDOVER REQUEST ACKNOWLEDGE message, the SMF shall, if supported, handle this information as specified in TS 23.247 [44].

If the *ECN Marking or Congestion Information Reporting Status* IE is included in the *Handover Request Acknowledge Transfer* IE, the SMF shall, if supported, use it to deduce if ECN marking at NG-RAN or ECN marking at UPF or congestion information reporting is active or not active as described in TS 23.501 [9].

**Interactions with RRC Inactive Transition Report procedure:**

If the *RRC Inactive Transition Report Request* IE is included in the HANDOVER REQUEST message and set to “subsequent state transition report”, the NG-RAN node shall, if supported, send the RRC INACTIVE TRANSITION REPORT message to the AMF to report the RRC state of the UE when the UE enters or leaves RRC\_INACTIVE state.

*Next Changes*

9.3.1.29 Source NG-RAN Node to Target NG-RAN Node Transparent Container

This IE is produced by the source NG-RAN node and is transmitted to the target NG-RAN node. For inter-system handovers to 5G, the IE is transmitted from the external handover source to the target NG-RAN node.

This IE is transparent to the 5GC.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| RRC Container | M |  | OCTET STRING | Includes the *HandoverPreparationInformation* message as defined in TS 38.331 [18] if the target is a Gnb.Includes the *HandoverPreparationInformation* message as defined in TS 36.331 [21] if the target is an ng-Enb. | - |  |
| **PDU Session Resource Information List** |  | *0..1* |  | For intra-system handovers in NG-RAN. | - |  |
| **>PDU Session Resource Information Item** |  | *1..<maxnoofPDUSessions>* |  |  | - |  |
| >>PDU Session ID | M |  | 9.3.1.50 |  | - |  |
| **>>QoS Flow Information List** |  | *1* |  |  | - |  |
| **>>>QoS Flow Information Item** |  | *1..<maxnoofQoSFlows>* |  |  | - |  |
| >>>>QoS Flow Identifier | M |  | 9.3.1.51 |  | - |  |
| >>>>DL Forwarding | O |  | 9.3.1.33 |  | - |  |
| >>>>UL Forwarding | O |  | 9.3.1.118 |  | YES | ignore |
| >>>>Source Transport Layer Address | O |  | Transport Layer Address9.3.2.4 | Identifies the TNL address used by the sending node for direct data forwardingtowards the target NG-RAN node | YES | ignore |
| >>>>Source Node Transport Layer Address | O |  | Transport Layer Address9.3.2.4 | Identifies the TNL address used by the source SN node for direct data forwardingtowards the target NG-RAN node | YES | ignore |
| >>DRBs to QoS Flows Mapping List | O |  | 9.3.1.34 |  | - |  |
| **E-RAB Information List** |  | *0..1* |  | For inter-system handovers to 5G. | - |  |
| **>E-RAB Information Item** |  | *1..<maxnoofE-RABs>* |  |  | - |  |
| >>E-RAB ID | M |  | 9.3.2.3 |  | - |  |
| >>DL Forwarding | O |  | 9.3.1.33 |  | - |  |
| >>Source Transport Layer Address | O |  | Transport Layer Address9.3.2.4 | Identifies the TNL address used by the sending node for direct data forwardingtowards the target NG-RAN node | YES | ignore |
| >>Source Node Transport Layer Address | O |  | Transport Layer Address9.3.2.4 | Identifies the TNL address used by the source SN node for direct data forwardingtowards the target NG-RAN node | YES | ignore |
| Target Cell ID | M |  | NG-RAN CGI9.3.1.73 |  | - |  |
| Index to RAT/Frequency Selection Priority | O |  | 9.3.1.61 |  | - |  |
| UE History Information | M |  | 9.3.1.95 |  | - |  |
| SgNB UE X2AP ID | O |  | 9.3.1.127 | Allocated at the Source en-Gnb | YES | ignore |
| UE History Information from UE | O |  | 9.3.1.166 |  | YES | ignore |
| Source Node ID | O |  | 9.3.1.195 | Source SN ID | YES | ignore |
| UE Context Reference at Source | O |  | RAN UE NGAP ID 9.3.3.2 |  | YES | ignore |
| **MBS Active Session Information Source to Target List** |  | *0..1* |  |  | YES | ignore |
| **>MBS Active Session Information Source to Target Item** |  | *1..<maxnoofMBSSessionsofUE>* |  |  | - |  |
| >>MBS Session ID | M |  | 9.3.1.206 |  | - |  |
| >>MBS Area Session ID | O |  | 9.3.1.207 | If included, this IE indicates the MBS Area Session ID of the UE at the NG-RAN node from which the UE context is transferred | - |  |
| >>MBS Service Area | O |  | 9.3.1.208 | Included if available in source NG-RAN node. | - |  |
| >>MBS QoS Flows To Be Setup List | M |  | 9.3.1.236 |  | - |  |
| **>>MBS Mapping and Data Forwarding Request List** |  | *0..1* |  |  | - |  |
| **>>>MBS Mapping and Data Forwarding Request Item** |  | *1..<maxnoofMRBs>* |  |  | - |  |
| >>>>MRB ID | M |  | 9.3.1.218 | Contains the MRB ID value allocated at the source NG-RAN node. | - |  |
| **>>>>MBS QoS Flow List** |  | *1..<maxnoofMBSQoSflows>* |  |  | - |  |
| >>>>>MBS QoS Flow Identifier | M |  | QoS Flow Identifier9.3.1.51 |  | - |  |
| >>>>MRB Progress Information | O |  | 9.3.1.219 | The SN information of the last packet which has already been delivered for the MRB.  | - |  |
| QMC Configuration Information | O |  | 9.3.1.223 | Used for passing the QoE measurement information from the source NG-RAN node to the target NG-RAN node. | YES | ignore |
| **NGAP IE Support Information Request List** |  | *0..1* |  |  | YES | ignore |
| **>NGAP IE Support Information Request Item** |  | *1..<maxnoofIESupportInfo>* |  |  | - |  |
| >>NGAP Protocol IE-Id | M |  | 9.3.1.239 |  | - |  |
| **Candidate Relay UE Information List** |  | *0..1* |  |  | YES | reject |
| **>Candidate Relay UE Information Item** |  | *1..<maxnoofCandidateRelayUEs>* |  |  | - |  |
| >>Candidate Relay UE ID | M |  | BIT STRING (SIZE(24)) | Includes the *SL-SourceIdentity* for the candidate relay UE as defined in TS 38.331 [18]. | - |  |
| **Time Based Handover Information** |  | *0..1* |  | This IE only applies to NTN. | YES | ignore |
| >Handover Window Start | M |  | INTEGER (0..549755813887) | Corresponds to information provided in *t1-Threshold* contained in the *ReportConfigNR* IE as defined in TS 38.331 [18] | - |  |
| >Handover Window Duration | M |  | INTEGER (1..6000) | Corresponds to information provided in the *duration* contained in the *condEventT1* contained in the *ReportConfigNR* IE as defined in TS 38.331 [18] | - |  |
| Source SN to Target SN QMC Information | O |  | 9.3.1.223 | This IE contains SN-related QMC configuration information to be forwarded to the target S-NG-RAN node upon inter-MN handover. | YES | ignore |

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| **Range bound** | **Explanation** |
| maxnoofPDUSessions | Maximum no. of PDU sessions allowed towards one UE. Value is 256. |
| maxnoofQoSFlows | Maximum no. of QoS flows allowed within one PDU session. Value is 64. |
| maxnoofE-RABs | Maximum no. of E-RABs allowed towards one UE. Value is 256. |
| maxnoofMBSSessions | Maximum no. of MBS sessions allowed within one PDU session. Value is 32. |
| maxnoofMBSSessionsofUE | Maximum no. of MBS sessions allowed towards one UE. Value is 256. |
| maxnoofMBSQoSflows | Maximum no. of MBS QoS flows allowed within one MBS session. Value is 64. |
| maxnoofMRBs | Maximum no. of MRBs. Value is 32. |
| maxnoofIESupportInfo | Maximum no. of IE Support Information. Value is 32. |
| maxnoofCandidateRelayUEs | Maximum no. of Candidate Relay UEs. Value is 32. |

*Next Changes*

#### 9.3.1.224 UE Application Layer Measurement Configuration Information

This IE defines configuration information for the QMC functionality.

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| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| QoE Reference | M |  | OCTET STRING (SIZE(6)) | *QoE Reference*, as defined in clause 5.2 of TS 28.405 [45]. It consists of MCC+MNC+QMC ID, where the MCC and MNC are received with the QMC activation request from the management system to identify one PLMN containing the management system, and QMC ID is a 3-byte Octet String. | - |  |
| Service Type | M |  | ENUMERATED(QMC for DASH streaming, QMC for MTSI, QMC for VR, ...) | This IE indicates the service type of QoE measurements. | - |  |
| CHOICE *Area Scope of QMC* | O |  |  |  | - |  |
| *>Cell based* |  |  |  |  |  |  |
| **>>Cell ID List for QMC** |  | *1..<maxnoofCellIDforQMC>* |  |  | - |  |
| >>>NG-RAN CGI | M |  | 9.3.1.73 | This IE can indicate an NR CGI or an E-UTRA CGI. | - |  |
| *>TA based* |  |  |  |  |  |  |
| **>>TA List for QMC** |  | *1..<maxnoofTAforQMC>* |  |  | - |  |
| >>>TAC | M |  | 9.3.3.10 | The TAI is derived using the current serving PLMN. | - |  |
| *>TAI based* |  |  |  |  |  |  |
| **>>TAI List for QMC** |  | *1..<maxnoofTAforQMC>* |  |  | - |  |
| >>>TAI | M |  | 9.3.3.11 |  | - |  |
| *>PLMN area based* |  |  |  |  |  |  |
| **>>PLMN List for QMC** |  | *1..<maxnoofPLMNforQMC>* |  |  | - |  |
| >>>PLMN Identity | M |  | 9.3.3.5 |  | - |  |
| Measurement Collection Entity IP Address | M |  | Transport Layer Address9.3.2.4 | The IP address of the entity receiving the QoE measurement report. | - |  |
| QoE Measurement Status | O |  | ENUMERATED(ongoing, …) | Indicates whether the QoE measurement has been started. Present in case of NG-based handover. | - |  |
| Container for Application Layer Measurement Configuration | O |  | OCTET STRING (SIZE(1.. 8000)) | Contains application layer measurement configuration, see Annex L in 26.247 [46], clause 16.5 in TS 26.114 [51] and clause 9 in TS 26.118 [52]. Present in case of initial QoE configuration, and shall be included in *Source to Target Transparent Container* IE for signalling-based QMC during NG-based handover. | - |  |
| Measurement Configuration Application Layer ID | O |  | INTEGER (0..15, …) | This IE is present only when the message containing it is NG-based handover related. The IE indicates the identity of the application layer measurement configuration and corresponds to the *MeasConfigAppLayerId* IE as defined in TS 38.331 [18]. | - |  |
| **Slice Support List for QMC** |  | *0..1* |  |  | - |  |
| **>Slice Support QMC Item** |  | *1..<maxnoofSNSSAIforQMC>* |  |  | - |  |
| >>S-NSSAI | M |  | 9.3.1.24 |  | - |  |
| CHOICE *MDT Alignment Information* | O |  |  | Indicates the MDT measurements with which alignment is required. | - |  |
| *>S-based MDT* |  |  |  |  |  |  |
| >>NG-RAN Trace ID | M |  | OCTET STRING (SIZE(8)) | This IE is composed of the following: Trace Reference defined in TS 32.422 [11] (leftmost 6 octets, with PLMN information encoded as in 9.3.3.5), and Trace Recording Session Reference defined in TS 32.422 [11] (last 2 octets). | - |  |
| Available RAN Visible QoE Metrics  | O |  | 9.3.1.225 | Present in case of initial QoE configuration and in case of NG-based handover for signalling-based QoE measurement. | - |  |
| Assistance Information for QoE Measurement | O |  | INTEGER (1..16, …) | This IE indicates the suggested priority of the application layer measurement configuration. Values are ordered in decreasing order of priority, i.e., with 1 as the highest priority and 16 as the lowest priority. | YES | ignore |
| MBS Communication Service Type | O |  | ENUMERATED (broadcast, multicast, ...) | This IE indicates the type of MBS communication service for which the QoE measurement collection should be performed. | YES | ignore |
| QoE and RVQoE Reporting Paths | O | 9.3.1.x1 |  | This IE indicates the SRBs currently used for QoE and RVQoE reporting for the present QoE measurement configuration. | YES | ignore |

|  |  |
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| 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. |
| maxnoofSNSSAIforQMC | Maximum no. of S-NSSAIs in the S-NSSAI list for QMC scope. Value is 16. |

*Next Changes*

#### 9.3.1.x1 QoE and RVQoE Reporting Paths

This IE indicates the SRB currently used for receiving the QoE reports and RAN visible QoE reports.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| QoE Reporting Path | O |  | ENUMERATED (srb4, srb5, …) | This IE indicates the SRB currently used for receiving the QoE reports. |
| RVQoE Reporting Path | O |  | ENUMERATED (srb4, srb5, …) | This IE indicates the SRB currently used for receiving the RAN Visible QoE reports. |

*Next Changes*

9.4.4 PDU Definitions

-- ASN1START

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

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-- PDU definitions for NGAP.

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

NGAP-PDU-Contents {

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

ngran-Access (22) modules (3) ngap (1) version1 (1) ngap-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

--

-- IE parameter types from other modules.

--

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

<unchanged text omitted>

FROM NGAP-IEs

 PrivateIE-Container{},

 ProtocolExtensionContainer{},

 ProtocolIE-Container{},

 ProtocolIE-ContainerList{},

 ProtocolIE-ContainerPair{},

 ProtocolIE-SingleContainer{},

 NGAP-PRIVATE-IES,

 NGAP-PROTOCOL-EXTENSION,

 NGAP-PROTOCOL-IES,

 NGAP-PROTOCOL-IES-PAIR

FROM NGAP-Containers

 id-A2X-PC5-QoS-Parameters,

 id-AerialUEsubscriptionInformation,

 id-AllowedNSSAI,

 id-AMFName,

 id-AMFOverloadResponse,

 id-AMFSetID,

 id-AMF-TNLAssociationFailedToSetupList,

 id-AMF-TNLAssociationSetupList,

 id-AMF-TNLAssociationToAddList,

 id-AMF-TNLAssociationToRemoveList,

 id-AMF-TNLAssociationToUpdateList,

 id-AMFTrafficLoadReductionIndication,

<unchanged text omitted>

 id-RoutingID,

 id-RRCEstablishmentCause,

 id-RRCInactiveTransitionReportRequest,

 id-RRC-Resume-Cause,

 id-RRCState,

 id-SecurityContext,

 id-SecurityKey,

 id-SelectedNID,

 id-SelectedPLMNIdentity,

 id-SerialNumber,

 id-ServedGUAMIList,

 id-SliceSupportList,

 id-S-NSSAI,

 id-SONConfigurationTransferDL,

 id-SONConfigurationTransferUL,

 id-SourceAMF-UE-NGAP-ID,

 id-SourceSN-to-TargetSN-QMCInfo,

 id-SourceToTarget-AMFInformationReroute,

 id-SourceToTarget-TransparentContainer,

 id-SRVCCOperationPossible,

 id-SupportedTAList,

 id-Suspend-Request-Indication,

 id-Suspend-Response-Indication,

 id-TAI,

 id-TAIListForPaging,

 id-TAIListForRestart,

 id-TargetID,

 id-TargetNSSAIInformation,

 id-TargettoSource-Failure-TransparentContainer,

 id-TargetToSource-TransparentContainer,

 id-TimeSyncAssistanceInfo,

 id-TimeToWait,

 id-TNGFIdentityInformation,

 id-TraceActivation,

 id-TraceCollectionEntityIPAddress,

 id-TraceCollectionEntityURI,

 id-TWIFIdentityInformation,

 id-UEAggregateMaximumBitRate,

 id-UE-associatedLogicalNG-connectionList,

 id-UECapabilityInfoRequest,

 id-UEContextRequest,

 id-UE-DifferentiationInfo,

 id-UE-NGAP-IDs,

 id-UEPagingIdentity,

 id-UEPresenceInAreaOfInterestList,

 id-UERadioCapability,

 id-UERadioCapability-EUTRA-Format,

 id-UERadioCapabilityForPaging,

 id-UERadioCapabilityID,

 id-UERetentionInformation,

 id-UESecurityCapabilities,

 id-UESliceMaximumBitRateList,

 id-UE-UP-CIoT-Support,

 id-UL-CP-SecurityInformation,

 id-UnavailableGUAMIList,

 id-UserLocationInformation,

 id-W-AGFIdentityInformation,

 id-WarningAreaCoordinates,

 id-WarningAreaList,

 id-WarningMessageContents,

 id-WarningSecurityInfo,

 id-WarningType,

 id-WUS-Assistance-Information,

 id-XrDeviceWith2Rx,

 id-SLPositioningRangingServiceInfo

*Next Changes*

### 9.4.5 Information Element Definitions

-- ASN1START

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

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-- Information Element Definitions

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

NGAP-IEs {

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

ngran-Access (22) modules (3) ngap (1) version1 (1) ngap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

 id-AdditionalDLForwardingUPTNLInformation,

 id-AdditionalULForwardingUPTNLInformation,

 id-AdditionalDLQosFlowPerTNLInformation,

 id-AdditionalDLUPTNLInformationForHOList,

 id-AdditionalNGU-UP-TNLInformation,

 id-AdditionalRedundantDL-NGU-UP-TNLInformation,

 id-AdditionalRedundantDLQosFlowPerTNLInformation,

 id-AdditionalRedundantNGU-UP-TNLInformation,

 id-AdditionalRedundantUL-NGU-UP-TNLInformation,

<unchanged text omitted>

 id-QoSFlowTSCList,

 id-TSCTrafficCharacteristicsFeedback,

 id-ANPacketDelayBudgetUL,

 id-MBSCommServiceType,

 id-MobileIAB-MTUserLocationInformation,

 id-PDUsetQoSParameters,

 id-PDUSetbasedHandlingIndicator,

 id-N6JitterInformation,

 id-ECNMarkingorCongestionInformationReportingRequest,

 id-ECNMarkingorCongestionInformationReportingStatus,

 id-XrDeviceWith2Rx,

 id-QoERVQoEReportingPaths,

 maxnoofAllowedAreas,

 maxnoofAllowedCAGsperPLMN,

 maxnoofAllowedS-NSSAIs,

 maxnoofAoIMinusOne,

 maxnoofBluetoothName,

 maxnoofBPLMNs,

 maxnoofCAGforMDT,

 maxnoofCAGSperCell,

 maxnoofCandidateCells,

 maxnoofCellIDforMDT,

 maxnoofCellIDforQMC,

 maxnoofCellIDforWarning,

 maxnoofCellinAoI,

<unchanged text omitted>

FROM NGAP-Constants

 Criticality,

 ProcedureCode,

 ProtocolIE-ID,

 TriggeringMessage

FROM NGAP-CommonDataTypes

 ProtocolExtensionContainer{},

 ProtocolIE-Container{},

 NGAP-PROTOCOL-EXTENSION,

 ProtocolIE-SingleContainer{},

 NGAP-PROTOCOL-IES

FROM NGAP-Containers;

<unchanged text omitted>

-- Q

QMCConfigInfo ::= SEQUENCE {

 uEAppLayerMeasInfoList UEAppLayerMeasInfoList,

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

 ...

}

QMCConfigInfo-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

 ...

}

QMCDeactivation ::= SEQUENCE {

 qoEReferenceList QoEReferenceList,

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

 ...

}

QMCDeactivation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

 ...

}

QoEReferenceList ::= SEQUENCE (SIZE(1..maxnoofUEAppLayerMeas)) OF QoEReference

QoEReference ::= OCTET STRING (SIZE(6))

QoERVQoEReportingPaths ::= SEQUENCE {

 qoEReportingPath ENUMERATED{srb4, srb5, ...} OPTIONAL,

 rVQoEReportingPath ENUMERATED{srb4, srb5, ...} OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { {QoERVQoEReportingPaths-ExtIEs} },

 ...

}

QoERVQoEReportingPaths-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

 ...

}

QosCharacteristics ::= CHOICE {

 nonDynamic5QI NonDynamic5QIDescriptor,

 dynamic5QI Dynamic5QIDescriptor,

 choice-Extensions ProtocolIE-SingleContainer { {QosCharacteristics-ExtIEs} }

}

QosCharacteristics-ExtIEs NGAP-PROTOCOL-IES ::= {

 ...

}

<unchanged text omitted>

SourceNGRANNode-ToTargetNGRANNode-TransparentContainer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

 { ID id-SgNB-UE-X2AP-ID CRITICALITY ignore EXTENSION SgNB-UE-X2AP-ID PRESENCE optional }|

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

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

 { ID id-UEContextReferenceAtSource CRITICALITY ignore EXTENSION RAN-UE-NGAP-ID PRESENCE optional }|

 { ID id-MBS-ActiveSessionInformation-SourcetoTargetList CRITICALITY ignore EXTENSION MBS-ActiveSessionInformation-SourcetoTargetList PRESENCE optional }|

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

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

 { ID id-CandidateRelayUEInformationList CRITICALITY reject EXTENSION CandidateRelayUEInformationList PRESENCE optional }|

 { ID id-TimeBasedHandoverInformation CRITICALITY ignore EXTENSION TimeBasedHandoverInformation PRESENCE optional }| { ID id-SourceSN-to-TargetSN-QMCInfo CRITICALITY ignore EXTENSION QMCConfigInfo PRESENCE optional },

 ...

}

<unchanged text omitted>

UEAppLayerMeasConfigInfo ::= SEQUENCE {

 qoEReference QoEReference,

 serviceType ServiceType,

 areaScopeOfQMC AreaScopeOfQMC OPTIONAL,

 measCollEntityIPAddress TransportLayerAddress,

 qoEMeasurementStatus ENUMERATED {ongoing,...} OPTIONAL,

 containerForAppLayerMeasConfig OCTET STRING (SIZE(1..8000)) OPTIONAL,

 measConfigAppLayerID INTEGER (0..15, ...) OPTIONAL,

 sliceSupportListQMC SliceSupportListQMC OPTIONAL,

 mDT-AlignmentInfo MDT-AlignmentInfo OPTIONAL,

 availableRANVisibleQoEMetrics AvailableRANVisibleQoEMetrics OPTIONAL,

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

 ...

}

UEAppLayerMeasConfigInfo-ExtIEs NGAP-PROTOCOL-EXTENSION::= {

 { ID id-AssistanceInformationQoE-Meas CRITICALITY ignore EXTENSION AssistanceInformationQoE-Meas PRESENCE optional }|

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

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

 ...

}

### **9.4.7 Constant Definitions**

<unchanged text omitted>

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

--

-- IEs

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

 id-AllowedNSSAI ProtocolIE-ID ::= 0

 id-AMFName ProtocolIE-ID ::= 1

 id-AMFOverloadResponse ProtocolIE-ID ::= 2

 id-AMFSetID ProtocolIE-ID ::= 3

 id-AMF-TNLAssociationFailedToSetupList ProtocolIE-ID ::= 4

 id-AMF-TNLAssociationSetupList ProtocolIE-ID ::= 5

 id-AMF-TNLAssociationToAddList ProtocolIE-ID ::= 6

 id-AMF-TNLAssociationToRemoveList ProtocolIE-ID ::= 7

 id-AMF-TNLAssociationToUpdateList ProtocolIE-ID ::= 8

 id-AMFTrafficLoadReductionIndication ProtocolIE-ID ::= 9

<unchanged text omitted>

 id-PNI-NPN-AreaScopeofMDT ProtocolIE-ID ::= 409

 id-PNI-NPNBasedMDT ProtocolIE-ID ::= 410

 id-SNPN-CellBasedMDT ProtocolIE-ID ::= 411

 id-SNPN-TAIBasedMDT ProtocolIE-ID ::= 412

 id-SNPN-BasedMDT ProtocolIE-ID ::= 413

 id-Partially-Allowed-NSSAI ProtocolIE-ID ::= 414

 id-AssociatedSessionID ProtocolIE-ID ::= 415

 id-MBS-AssistanceInformation ProtocolIE-ID ::= 416

 id-BroadcastTransportFailureTransfer ProtocolIE-ID ::= 417

 id-BroadcastTransportRequestTransfer ProtocolIE-ID ::= 418

 id-BroadcastTransportResponseTransfer ProtocolIE-ID ::= 419

 id-TimeBasedHandoverInformation ProtocolIE-ID ::= 420

 id-DLDiscarding ProtocolIE-ID ::= 421

 id-PDUsetQoSParameters ProtocolIE-ID ::= 422

 id-PDUSetbasedHandlingIndicator ProtocolIE-ID ::= 423

 id-N6JitterInformation ProtocolIE-ID ::= 424

 id-ECNMarkingorCongestionInformationReportingRequest ProtocolIE-ID ::= 425

 id-ECNMarkingorCongestionInformationReportingStatus ProtocolIE-ID ::= 426

 id-ERedCapIndication ProtocolIE-ID ::= 427

 id-XrDeviceWith2Rx ProtocolIE-ID ::= 428

 id-UserPlaneErrorIndicator ProtocolIE-ID ::= 429

 id-SLPositioningRangingServiceInfo ProtocolIE-ID ::= 430

 id-SourceSN-to-TargetSN-QMCInfo ProtocolIE-ID ::= xx1

 id-QoERVQoEReportingPaths ProtocolIE-ID ::= xx2

END

-- ASN1STOP

*End of Changes*