**3GPP TSG-RAN WG3 Meeting #114-e R3-21xxxx**

**Online, Nov 1st – Nov 11th 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **36.423** | **CR** | **xxx** | **rev** | **-** | **Current version:** | **16.7.0** |  |
|  |
| *For* [***HE******LP***](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:***  | X2AP Rapporteur Corrections |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | R3 |
|  |  |
| ***Work item code:*** | TEI17 |  | ***Date:*** | 2021-10-21 |
|  |  |  |  |  |
| ***Category:*** | **D** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | Rapporteur clean-up for X2AP specification. |
|  |  |
| Summary of change: | * 8.2.2: Align with previous discussion.
* 8.3.13: Fix the wrong term “the target eNB” in the Retrieve UE Context procedure.
* 8.3.15, 9.1.2.31, 9.1.2.32, 9.2.125, 9.2.145: Replace “ by ".
* 9.1.1.5, 9.1.3.11, 9.1.4.8, 9.2.157: Remove the redundant “,” within IE type and reference for ENUMERATED.
* 9.2.121: Fix the small letter.
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|  |  |
| ***Consequences if not approved:*** | Errors remain in the specification. |
|  |  |
| ***Clauses affected:*** | 8.2.2, 8.3.13, 8.3.15, 9.1.1.5, 9.1.2.31, 9.1.2.32, 9.1.3.11, 9.1.4.8, 9.2.121, 9.2.125, 9.2.145, 9.2.157 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

//////////////////////////////////////////////////////////// Start changes ////////////////////////////////////////////////////////////

### 8.2.2 SN Status Transfer

#### 8.2.2.1 General

The purpose of the SN Status Transfer procedure is to transfer the uplink PDCP SN and HFN receiver status and the downlink PDCP SN and HFN transmitter status either, from the source to the target eNB during an X2 handover, between the eNBs involved in dual connectivity and/or LWA, or between MeNB and en-gNB involved in EN-DC, for each respective E-RAB for which PDCP SN and HFN status preservation applies.

In case that the X2 handover is a DAPS handover, the SN Status Transfer procedure may also be used to transfer the uplink PDCP SN and HFN receiver status, and the downlink PDCP SN and HFN transmitter status for an E-RAB associated with RLC-UM and configured with DAPS as described in TS 36.300 [15].

If the SN Status Transfer procedure is applied in the course of dual connectivity, LWA, RRC connection re-establishment or EN-DC, in the subsequent specification text

- the behaviour of the eNB from which the E-RAB context is transferred, i.e., the eNB involved in dual connectivity, LWA, RRC connection re-establishment from which data forwarding, is specified by the behaviour of the "source eNB",

- the behaviour of the eNB to which the E-RAB context is transferred, i.e., the eNB involved in dual connectivity, LWA, RRC connection re-establishment to which data is forwarded, is specified by the behaviour of the "target eNB".

- in case of EN-DC, the behaviour of the node from which the E-RAB context is transferred, i.e., either the en-gNB or the MeNB from which data is forwarded, is specified by the behaviour of the "source eNB",

- in case of EN-DC, the behaviour of the node to which the E-RAB context is transferred, i.e., either the en-gNB or the MeNB to which data is forwarded, is specified by the behaviour of the "target eNB".

The procedure uses UE-associated signalling.

//////////////////////////////////////////////////////////// Next changes ////////////////////////////////////////////////////////////

### 8.3.13 Retrieve UE Context

#### 8.3.13.1 General

The purpose of the Retrieve UE Context procedure is to retrieve the UE context from the eNB where the RRC connection has been suspended (old eNB) and transfer it to the eNB where the RRC Connection has been requested to be resumed (new eNB) or to retrieve the UE context for a UE which attempts to re-establish its RRC connection in an eNB (the new eNB) different from the eNB (the old eNB) where the RRC connection failed, e.g. due to RLF.

The procedure uses UE-associated signalling.

#### 8.3.13.2 Successful Operation



Figure 8.3.13.2-1: Retrieve UE Context, successful operation

The new eNB initiates the procedure by sending the RETRIEVE UE CONTEXT REQUEST message to the old eNB.

If the old eNB is able to identify the UE context and to successfully verify the UE by means of the Resume ID, the ShortMAC-I, optionally the C-RNTI, the failure cell PCI and the E-UTRAN Cell Identifier of the new cell contained in the RETRIEVE UE CONTEXT REQUEST message, it shall respond with the RETRIEVE UE CONTEXT RESPONSE message. 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].

If the *C-RNTI* IE is present in the RETRIEVE UE CONTEXT REQUEST, the old eNB shall ignore the *Resume ID* IE.

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

If the PLMN of the new cell is not the Serving PLMN stored in the UE Context the old eNB shall replace the Serving PLMN with the PLMN of the new cell and move the Serving PLMN to the equivalent PLMN list, before propagating the roaming and access restriction information to the new eNB.The new eNB shall act upon reception of the

- *UE Security Capabilities* IE,

- *AS Security Information* IE,

- *Subscriber Profile ID for RAT/Frequency priority* IE,

- *Additional RRM Policy Index* IE,

- *Handover Restriction List* IE,

- *Location Reporting Information* IE,

- *Management Based MDT Allowed* IE

- *Management Based MDT PLMN List* IE

- *Trace Activation* IE,

- *SRVCC Operation Possible* IE,

- *Masked IMEISV* IE

- *Expected UE Behaviour* IE,

- *ProSe Authorized* IE,

- *V2X Services Authorized* IE,

- *Aerial UE subscription information* IE,

- *Subscription Based* *UE Differentiation Information* IE,

- *EPC Handover Restriction List Container* IE,

within the RETRIEVE UE CONTEXT RESPONSE message as specified for the new eNB upon reception of the HANDOVER REQUEST message for the Handover Preparation procedure.

If the *UE Sidelink* *Aggregate Maximum Bit Rate* IE is contained in the RETRIEVE UE CONTEXT RESPONSE message, the new eNB shall, if supported, use it for the concerned UE’s sidelink communication in network scheduled mode for V2X services.

If the *Aerial UE subscription information* IE is included in the RETRIEVE UE CONTEXT RESPONSE message, the new eNB shall, if supported, store this information in the UE context and use it as defined in TS 36.300 [15].

For each E-RAB for which the old eNB proposes to do forwarding of downlink data, the old eNB shall include the *DL Forwarding* IE within the *E-RABs To Be Setup Item* IE of the RETRIEVE UE CONTEXT RESPONSE message.

If the *Bearer Type* IE is included in the RETRIEVE UE CONTEXT RESPONSE message and is set to "non IP", then the new eNB shall not perform IP header compression for the concerned E-RAB.

If the *Ethernet Type* IE is included in the RETRIEVE UE CONTEXT RESPONSE message and is set to "True", then the new eNB shall, if supported, take this into account to perform header compression appropriately for the concerned E-RAB.

If the *NR UE Sidelink* *Aggregate Maximum Bit Rate* IE is contained in the RETRIEVE UE CONTEXT RESPONSE message, the new eNB shall, if supported, use it for the concerned UE’s sidelink communication in network scheduled mode for NR V2X services.

If the *NR* *V2X Services Authorized* IE is contained in the RETRIEVE UE CONTEXT RESPONSE 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 *PC5 QoS Parameters* IE is contained in theRETRIEVE UE CONTEXT RESPONSE message, the new eNB shall, if supported, use it for the concerned UE’s NR sidelink communication as specified in TS 23.285 [41].

If the *UE Radio Capability ID* IE is contained in the RETRIEVE UE CONTEXT RESPONSE message, the new eNB shall, if supported, store this information in the UE context and use it as specified in TS 23.401 [12].

If the *IMS voice EPS fallback from 5G* IE is contained in the RETRIEVE UE CONTEXT RESPONSE message, the new eNB shall, if supported, store this information in the UE context and consider that the UE was previously handed over from NG-RAN to E-UTRAN due to an IMS voice fallback.

#### 8.3.13.3 Unsuccessful Operation



Figure 8.3.13.3-1: Retrieve UE Context, unsuccessful operation

If the old eNB is not able to identify the UE context by means of the Resume ID, or with the ShortMAC-I, C-RNTI, failed cell PCI and new E-UTRAN Cell Identifier contained in the RETRIEVE UE CONTEXT REQUEST message, it shall respond to the new eNB with the RETRIEVE UE CONTEXT FAILURE message.

//////////////////////////////////////////////////////////// Next changes ////////////////////////////////////////////////////////////

### 8.3.15 Data Forwarding Address Indication

#### 8.3.15.1 General

The purpose of the Data Forwarding Address Indication procedure is to allow the new eNB to provide data forwarding addresses to the old eNB in case the RRC connection has been re-established, as specified in TS 36.300 [15].

For Dual Connectivity or EN-DC, the Data Forwarding Address Indication procedure is used during a Conditional Handover to provide data forwarding related information from the MeNB to the SeNB as specified in TS 36.300 [15], or from the MeNB to the en-gNB as specified in TS 37.340 [32].

The procedure uses UE-associated signalling.

#### 8.3.15.2 Successful Operation



Figure 8.3.15.2-1: Data Forwarding Address Indication, successful operation

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Figure 8.3.15.2-2: Data Forwarding Address Indication for Conditional Handover, successful operation

The new eNB initiates the procedure by sending a DATA FORWARDING ADDRESS INDICATION message to the old eNB.

For each E-RAB included in *E-RABs Data Forwarding Address List* IE, the new eNB indicates that it requests data forwarding of downlink packets to the GTP TEID indicated in the *DL GTP Tunnel Endpoint* IE.

If the DATA FORWARDING ADDRESS INDICATION message includes the *CHO DC Indicator* IE, the SeNB (respectively, the en-gNB for EN-DC) shall, if supported, consider that the DATA FORWARDING ADDRESS INDICATION message concerns a Conditional Handover, and act as specified in TS 36.300 [15] for dual connectivity (respectively, act as specified in TS 37.340 [32] for EN-DC).

If the DATA FORWARDING ADDRESS INDICATION message includes the *CHO DC Early Data Forwarding Indicator* IE set to "stop", the SeNB (respectively, the en-gNB for EN-DC) shall, if supported and if already initiated, stop early data forwarding for the provided E-RABs Data Forwarding Address information.

**EN-DC**

If the MeNB sends the message to the en-gNB, then the *SgNB UE X2AP ID* IE shall be included in the DATA FORWARDING ADDRESS INDICATION message, while the *New eNB UE X2AP ID* IE is ignored. The *SgNB UE X2AP ID* IE is used as the new UE ID.

#### 8.3.15.3 Unsuccessful Operation

Not applicable.

#### 8.3.15.4 Abnormal Conditions

Void.

//////////////////////////////////////////////////////////// Next changes ////////////////////////////////////////////////////////////

#### 9.1.1.5 UE CONTEXT RELEASE

This message is sent by the target eNB to the source eNB to indicate that resources can be released.

Direction: target eNB → source eNB (handover), MeNB → SeNB (dual connectivity), MeNB → en-gNB (EN-DC).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.2.13 |  | YES | ignore |
| Old eNB UE X2AP ID | M |  | eNB UE X2AP ID9.2.24 | Allocated for handover at the source eNB and for dual connectivity at the SeNB. | YES | reject |
| New eNB UE X2AP ID | M |  | eNB UE X2AP ID9.2.24 | Allocated for handover at the target eNB and for dual connectivity/EN-DC at the MeNB. | YES | reject |
| Old eNB UE X2AP ID Extension | O |  | Extended eNB UE X2AP ID9.2.86 | Allocated for handover at the source eNB and for dual connectivity at the SeNB. | YES | reject |
| New eNB UE X2AP ID Extension | O |  | Extended eNB UE X2AP ID9.2.86 | Allocated for handover at the source eNB and for dual connectivity/EN-DC at the MeNB. | YES | reject |
| SIPTO Bearer Deactivation Indication  | O |  | ENUMERATED (True, …) | Indicates that SIPTO@LN PDN connection deactivation is needed. | YES | ignore |
| SgNB UE X2AP ID | O |  | en-gNB UE X2AP ID9.2.100 | Allocated for EN-DC at the SgNB. | YES | ignore |

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#### 9.1.2.31 EN-DC X2 SETUP REQUEST

This message is sent by an initiating node to a neighbouring node, both nodes able to interact for EN-DC, to transfer the initialization information for a TNL association.

Direction: eNB → en-gNB, en-gNB → eNB.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.2.13 |  | YES | reject |
| CHOICE *Initiating NodeType* | M |  |  |  | YES | reject |
| >*eNB* |  |  |  |  |  |  |
| >>Global eNB ID | M |  | 9.2.22 |  | YES | reject |
| **>>List of Served E-UTRA Cells** |  | *1 .. <maxCellineNB>* |  | Complete list of cells served by the eNB | YES | reject |
| >>>Served E-UTRA Cell Information | M |  | Served Cell Information 9.2.8 |  | – |  |
| >>>NR Neighbour Information | O |  | 9.2.98 | NR neighbours | – |  |
| >>Interface Instance Indication | O |  | 9.2.143 | NOTE: In the current version of this specification this IE is not included in the *Initiating Node Type* IE. | YES | reject |
| >>Cell and Capacity Assistance Information | O |  | 9.2.146 |  | YES | ignore |
| >*en-gNB* |  |  |  |  |  |  |
| >>Global en-gNB ID | M |  | 9.2.112 |  | YES | reject |
| **>>List of Served NR Cells** |  | *1 .. <maxCellinengNB>* |  | List of cells served by the en-gNB. If a partial list of cells is signalled, it contains at least one cell per carrier configured at the gNB. | YES | reject |
| >>>Served NR Cell Information | M |  | 9.2.110 |  | – |  |
| >>>NR Neighbour Information | O |  | 9.2.98 | NR neighbours. | – |  |
| >>Partial List Indicator | O |  | ENUMERATED (partial, ...) | Value "partial" indicates that a partial list of cells is included in the *List of Served NR Cells* IE  | YES | ignore |
| Interface Instance Indication | O |  | 9.2.143 |  | YES | reject |
| TNL Transport Layer Address info | O |  | 9.2.149 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxCellineNB | Maximum no. cells that can be served by an eNB. Value is 256. |
| maxCellinengNB | Maximum no. cells that can be served by an en-gNB. Value is 16384. |

#### 9.1.2.32 EN-DC X2 SETUP RESPONSE

This message is sent by a neighbouring node to an initiating node, both nodes able to interact for EN-DC, to transfer the initialization information for a TNL association.

Direction: eNB → en-gNB, en-gNB → eNB.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.2.13 |  | YES | reject |
| CHOICE *Responding NodeType* | M |  |  |  | YES | reject |
| >*eNB* |  |  |  |  |  |  |
| >>Global eNB ID | M |  | 9.2.22 |  | YES | reject |
| **>>List of Served E-UTRA Cells** |  | *1 .. <maxCellineNB>* |  | Complete list of cells served by the eNB | YES | reject |
| >>>Served E-UTRA Cell Information | M |  | Served Cell Information 9.2.8 |  | – |  |
| >>>NR Neighbour Information | O |  | 9.2.98 | NR neighbours | – |  |
| >>Cell and Capacity Assistance Information | O |  | 9.2.146 |  | YES | ignore |
| >*en-gNB* |  |  |  |  |  |  |
| >>Global en-gNB ID | M |  | 9.2.112 |  | YES | reject |
| **>>List of Served NR Cells** |  | *1 .. <maxCellinengNB>* |  | List of cells served by the en-gNB. If a partial list of cells is signalled, it contains at least one cell per carrier configured at the gNB. | YES | reject |
| >>>Served NR Cell Information | M |  | 9.2.110 |  | – |  |
| >>>NR Neighbour Information | O |  | 9.2.98 | NR neighbours | – |  |
| >>Partial List Indicator | O |  | ENUMERATED (partial, ...) | Value "partial" indicates that a partial list of cells is included in the *List of Served NR Cells* IE  | YES | ignore |
| Interface Instance Indication | O |  | 9.2.143 |  | YES | reject |
| TNL Transport Layer Address info | O |  | 9.2.149 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxCellineNB | Maximum no. cells that can be served by an eNB. Value is 256. |
| maxCellinengNB | Maximum no. cells that can be served by an en-gNB. Value is 16384. |

//////////////////////////////////////////////////////////// Next changes ////////////////////////////////////////////////////////////

#### 9.1.3.11 SENB RELEASE REQUEST

This message is sent by the MeNB to the SeNB to request the release of resources.

Direction: MeNB → SeNB.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.2.13 |  | YES | ignore |
| MeNB UE X2AP ID | M |  | eNB UE X2AP ID9.2.24 | Allocated at the MeNB | YES | reject |
| SeNB UE X2AP ID | O |  | eNB UE X2AP ID9.2.24 | Allocated at the SeNB | YES | reject |
| Cause | O |  | 9.2.6 |  | YES | ignore |
| **E-RABs To Be Released List** |  | *0..1* |  |  | YES | ignore |
| **> E-RABs To Be Released Item** |  | *1 .. <maxnoofBearers>* |  |  | EACH | ignore |
| >>CHOICE *Bearer Option* | M |  |  |  |  |  |
| >>>*SCG Bearer* |  |  |  |  |  |  |
| >>>>E-RAB ID | M |  | 9.2.23 |  | – |  |
| >>>>UL Forwarding GTP Tunnel Endpoint | O |  | GTP Tunnel Endpoint 9.2.1 | Identifies the X2 transport bearer used for forwarding of UL PDUs | – |  |
| >>>>DL Forwarding GTP Tunnel Endpoint | O |  | GTP Tunnel Endpoint 9.2.1 | Identifies the X2 transport bearer. used for forwarding of DL PDUs | – |  |
| >>>*Split Bearer* |  |  |  |  |  |  |
| >>>>E-RAB ID | M |  | 9.2.23 |  | – |  |
| >>>>DL Forwarding GTP Tunnel Endpoint | O |  | GTP Tunnel Endpoint 9.2.1 | Identifies the X2 transport bearer. used for forwarding of DL PDUs | – |  |
| UE Context Kept Indicator | O |  | 9.2.85 |  | YES | ignore |
| MeNB UE X2AP ID Extension | O |  | Extended eNB UE X2AP ID9.2.86 | Allocated at the MeNB | YES | reject |
| SeNB UE X2AP ID Extension | O |  | Extended eNB UE X2AP ID9.2.86 | Allocated at the SeNB | YES | reject |
| MakeBeforeBreak Indicator | O |  | ENUMERATED (True, …) |  | YES | ignore |

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

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#### 9.1.4.8 SGNB MODIFICATION REQUIRED

This message is sent by the en-gNB to the MeNB to request the modification of en-gNB resources for a specific UE.

Direction: en-gNB → MeNB.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.2.13 |  | YES | reject |
| MeNB UE X2AP ID | M |  | eNB UE X2AP ID9.2.24 | Allocated at the MeNB. | YES | reject |
| SgNB UE X2AP ID | M |  | en-gNB UE X2AP ID9.2.100 | Allocated at the en-gNB. | YES | reject |
| Cause | M |  | 9.2.6 |  | YES | ignore |
| PDCP Change Indication | O |  | 9.2.109 |  | YES | ignore |
| **E-RABs To Be Released List** |  | *0..1* |  |  | YES | ignore |
| **>E-RABs To Be Released Item** |  | *1 .. <maxnoofBearers>* |  |  | EACH | ignore |
| >>E-RAB ID | M |  | 9.2.23 |  | – |  |
| >>Cause | M |  | 9.2.6 |  | – |  |
| >>RLC Mode | O |  | RLC Mode9.2.119 | Indicates the RLC mode at the en-gNB for PDCP transfer to MeNB. | YES | ignore |
| SgNB to MeNB Container | O |  | OCTET STRING | Includes the NR *CG-Config* message as defined in TS 38.331 [31]. | YES | ignore |
| MeNB UE X2AP ID Extension | O |  | Extended eNB UE X2AP ID9.2.86 | Allocated at the MeNB | YES | reject |
| **E-RABs To Be Modified List** |  | *0..1* |  |  | YES | ignore |
| **>E-RABs To Be Modified Item** |  | *1 .. <maxnoofBearers>* |  |  | EACH | ignore |
| >>E-RAB ID | M |  | 9.2.23 |  | – |  |
| >>EN-DC Resource Configuration | M |  | EN-DC Resource Configuration9.2.108 | Indicates the PDCP and Lower Layer MCG/SCG configuration. | – |  |
| >>CHOICE *Resource Configuration* | M |  |  |  |  |  |
| >>>*PDCP present in SN* |  |  |  | This choice tag is used if the *PDCP at SgNB* IE in the *EN-DC Resource Configuration* IE is set to the value "present". |  |  |
| >>>>Requested MCG E-RAB Level QoS Parameters | O |  | E-RAB Level QoS Parameters 9.2.9 | Includes E-RAB level QoS parameters requested to be provided by the MCG. | – |  |
| >>>>UL Configuration | O |  | 9.2.118 | Information about UL usage in the MeNB. | – |  |
| >>>>UL PDCP SN Length | O |  | PDCP SN Length9.2.133 | Shall be ignored by the MeNB if received. | YES | ignore |
| >>>>DL PDCP SN Length | O |  | PDCP SN Length9.2.133 | Shall be ignored by the MeNB if received. | YES | ignore |
| >>>>SgNB UL GTP Tunnel Endpoint at PDCP | O |  | GTP Tunnel Endpoint 9.2.1 | SgNB endpoint of the X2-U transport bearer at PDCP. For delivery of UL PDCP PDUs. | – |  |
| >>>>S1 DL GTP Tunnel Endpoint at the SgNB | O |  | GTP Tunnel Endpoint 9.2.1 | en-gNB endpoint of the S1 transport bearer. For delivery of DL PDUs. | – |  |
| >>>>New DRB ID Request | O |  | ENUMERATED (True, …) |  | YES | ignore |
| *>>>PDCP not present in SN* |  |  |  | This choice tag is used if the *PDCP at SgNB* IE in the *EN-DC Resource Configuration* IE is set to the value "not present". |  |  |
| >>>>SgNB DL GTP Tunnel Endpoint at SCG | O |  | GTP Tunnel Endpoint 9.2.1 | SgNB endpoint of the X2-U transport bearer at the SCG. For delivery of DL PDCP PDUs. | – |  |
| >>>>Secondary SgNB DL GTP Tunnel Endpoint at SCG | O |  | GTP Tunnel Endpoint 9.2.1 | SgNB endpoint of the X2-U transport bearer at the SCG. For delivery of DL PDCP PDUs for PDCP duplication. | – |  |
| >>>>RLC Status | O |  | 9.2.131 | Indicates the RLC has been re-established.. |  |  |
| >>>>LCID | O |  | 9.2.138 | Indicate the LCID of the primary path in case of PDCP duplication | YES | ignore |
| SgNB Resource Coordination Information | O |  | 9.2.117 | Information used to coordinate resources utilisation between the en-gNB and the MeNB. | YES | ignore |
| RRC config indication | O |  | 9.2.132 | Indicates the type of RRC configuration used at the en-gNB. | YES | reject |
| Location Information at SgNB | O |  | 9.2.142 | Contains information to support localisation of the UE | YES | ignore |

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

//////////////////////////////////////////////////////////// Next changes ////////////////////////////////////////////////////////////

### 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. | - |  |

|  |  |
| --- | --- |
| 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. |

//////////////////////////////////////////////////////////// Next changes ////////////////////////////////////////////////////////////

### 9.2.125 Protected E-UTRA Resource Indication

This IE indicates the resources allocated for E-UTRA DL and UL reference and control signals (hereby referred to as protected resources). This information is used in the process of E-UTRA – NR Cell Resource Coordination.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Activation SFN | M |  | INTEGER (0..1023) | Indicates from which SFN of the receiving node the resource allocation is valid. |  |  |
| **Protected Resource List** |  | *1* |  | The protected resource pattern is continuously repeated, and it is valid until stated otherwise or until replaced by a new pattern. The pattern does not apply in reserved subframes. | YES | ignore |
| **>Protected Resource List Item** |  | *1..<maxnoofProtectedResourcePatterns>* |  | Each item describes one transmission pattern. A pattern may comprise several control signals. | - |  |
| >>Resource Type | M |  | ENUMERATED (downlinknonCRS,CRS,uplink…) | Indicates whether the protected resource is E-UTRA DL non-CRS, E-UTRA CRS or E-UTRA UL.  | - |  |
| >>Intra-PRB Protected Resource Footprint | M |  | BIT STRING (84, ...) | The bitmap of REs occupied by the protected signal within one PRB. Each position in the bitmap represents an RE in one PRB; value "0" indicates "resource not protected", value "1" indicates "resource protected". The first bit of the string corresponds to the RE with the smallest time and frequency index in the PRB, where the indexing first goes into the frequency domain. The length of the bit string equals the product of and the length of PRB in time dimension, measured in REs. is defined in TS 36.211 [10]. The intra-PRB pattern consisting of all "1"s is equivalent to PRB-level granularity.  |  |  |
| >>Protected Footprint Frequency Pattern | M |  | BIT STRING(6..110, ...) | The bit string indicates in which PRBs inside carrier bandwidth the Intra-PRB Protected Resource Footprint applies. How often in time dimension this frequency pattern applies, depends on time periodicity of Intra-PRB Protected Resource Footprint. The first bit of the bit string corresponds to the PRB occupying the lowest subcarrier frequencies of the carrier bandwidth, where the indexing first goes into the frequency domain. Each position in the string represents a PRB; value "0" indicates " Intra-PRB Protected Resource Footprint does not appear in PRB", value "1" indicates "Intra-PRB Protected Resource Footprint appears in PRB". The length of the bit string equals the number of PRBs in the carrier bandwidth.  | - |  |
| **>>Protected Footprint Time Pattern** | M |  |  | The description of time periodicity of the Intra-PRB Protected Resource Footprint. |  |  |
| >>>Protected Footprint Time-periodicity | M |  | INTEGER(1..320, ...) | Periodicity with which the periodic Intra-PRB Protected Resource Footprint repeats in time-dimension (1= every PRB (i.e. slot), 2=every other PRB (i.e. slot) etc. | - |  |
| >>>Protected Footprint Start Time | M |  | INTEGER(1..20, ...) | The time-position of the PRB inside the frame in which the periodic Intra-PRB Protected Resource Footprint appears for the first time. The value "1" corresponds to the receiving node’s slot 0 in subframe 0 in the receiving node’s radio frame where SFN = Activation SFN.  | - |  |
| MBSFN Control Region Length | O |  | INTEGER(0..3) | Length of control region in MBSFN subframes. Expressed in REs, in the time dimension.  |  |  |
| PDCCH Region Length | M |  | INTEGER(1..3) | Length of PDCCH region in regular subframes. Expressed in REs, in the time dimension.  |  |  |

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| Range bound | Explanation |
| maxnoofProtectedResourcePatterns | Maximum no. protected resource patterns. Value is 16. |

//////////////////////////////////////////////////////////// Next changes ////////////////////////////////////////////////////////////

### 9.2.145 Lower Layer presence status change

This IE is used to indicate that lower layer resources’ presence status shall be changed. If the presence status is set to "release lower layers" or "suspend lower layers", PDCP entities, X2-U bearer resources, S1-U bearer resources and UE context information shall be kept.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Lower Layer presence status change | M |  | ENUMERATED (release lower layers, re-establish lower layers, suspend lower layers, resume lower layers ...) | "re-establish lower layers" shall be only set after "release lower layers" has been indicated."resume lower layers" shall restore SCG."resume lower layers" shall be only set after "suspend lower layers" has been indicated. |

//////////////////////////////////////////////////////////// Next changes ////////////////////////////////////////////////////////////

### 9.2.157 Ethernet Type

This IE is used to indicate that Ethernet data is expected.

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| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Ethernet Type | M |  | ENUMERATED(True, …) |  |