**3GPP TSG-RAN WG3 meeting #108-eR3-204403**

**Online, 1st – 11th June, 2020**

|  |
| --- |
| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **38.463** | **CR** | **0162** | **rev** | **6** | **Current version:** | **16.1.1** |  |
|  |
| *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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | BL CR to 38.463: Support for IAB |
|  |  |
| ***Source to WG:*** | Huawei, Nokia, Nokia Shanghai Bell,Samsung |
| ***Source to TSG:*** | R3 |
|  |  |
| ***Work item code:*** |  NR\_IAB-Core |   | ***Date:*** | 2020-06-15 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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:*** | Add the support for IAB  |
|  |  |
| ***Summary of change:*** | * Introduce of a new “*QoS Mapping Information*” IE to carry DSCP and/or Flow Label information in *UP Parameters* IE in both BEARER CONTEXT SETUP REQUEST message and BEARER CONTEXT MODIFICATION REQUEST message.
* Merge the agreed TP (R3-204384) after RAN3 108-e meeting: add new NUA procedure for IAB related configuration update
 |
|  |  |
| ***Consequences if not approved:*** | IAB donor DU is unable to perform the bearer mapping after receiving downlink IP packets from IAB donor CU-UP. |
|  |  |
| ***Clauses affected:*** | 3.2, 8.3.1.2, 8.3.2.2, 8.x(new), 8.x.1(new), 8.x.1.1(new), 8.x.1.2(new), 8.x.1.3(new), 8.x.1.4(new), 9.2.x(new), 9.2.x.1(new), 9.2.x.2(new), 9.2.x.3(new), 9.3.1.2, 9.3.1.13, 9.3.1.X(new), 9.4.3, 9.4.4, 9.4.5, 9.4.7 |
|  |  |
|  | **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:*** | Rev 1:Introduce of a new “*QoS Mapping Information*” IE to carry DSCP and/or Flow Label information in *UP Parameters* IE for both BEARER CONTEXT SETUP REQUEST message and BEARER CONTEXT MODIFICATION REQUEST message.Rev 2: R3-196494Change the title of this CR, and Submit to the RAN3 #106 meeting.Rev 3: R3-200017Update based on the latest TS 38.463 version 16.0.0, and submit to the RAN3 #107-e meeting. Rev 4: R3-201530Update based on the new TS 38.463 version 16.1.0, and submit to the RAN3 #107bis-e meeting.Rev 5: R3-203003Update based on the latest TS 38.463 version 16.1.1, and submit to the RAN3 #108-e meetingRev 6: R3-204403Merge the agreed TP (R3-204384) after RAN3 108-e meeting: add new NUA procedure for IAB related configuration update.Fix ASN.1 part.Add Nokia, Nokia Shanghai Bell and Samsung as co-source company. |

**------------------------------------------------1st Change -----------------------------------------------------**

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply.
An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

5GC 5G Core Network

5QI 5G QoS Identifier

CGI Cell Global Identifier

CN Core Network

CP Control Plane

DL Downlink

EN-DC E-UTRA-NR Dual Connectivity

EPC Evolved Packet Core

IAB Integrated Access and Backhaul

MCG Master Cell Group

NSSAI Network Slice Selection Assistance Information

RANAC RAN Area Code

SCG Secondary Cell Group

SDAP Service Data Adaptation Protocol

S-NSSAI Single Network Slice Selection Assistance Information

TNLA Transport Network Layer Association

**------------------------------------------------2nd Change -----------------------------------------------------**

8 E1AP procedures

8.1 List of E1AP Elementary Procedures

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

**Table 1: Class 1 procedures**

|  |  |  |  |
| --- | --- | --- | --- |
| **Elementary Procedure** | **Initiating Message** | **Successful Outcome** | **Unsuccessful Outcome** |
| **Response message** | **Response message** |
| Reset | RESET | RESET ACKNOWLEDGE |  |
| gNB-CU-UP E1 Setup | GNB-CU-UP E1 SETUP REQUEST | GNB-CU-UP E1 SETUP RESPONSE | GNB-CU-UP E1 SETUP FAILURE |
| gNB-CU-CP E1 Setup | GNB-CU-CP E1 SETUP REQUEST | GNB-CU-CP E1 SETUP RESPONSE | GNB-CU-CP E1 SETUP FAILURE |
| gNB-CU-UP Configuration Update | GNB-CU-UP CONFIGURATION UPDATE | GNB-CU-UP CONFIGURATION UPDATE ACKNOWLEDGE | GNB-CU-UP CONFIGURATION UPDATE FAILURE |
| gNB-CU-CP Configuration Update | GNB-CU-CP CONFIGURATION UPDATE | GNB-CU-CP CONFIGURATION UPDATE ACKNOWLEDGE | GNB-CU-CP CONFIGURATION UPDATE FAILURE |
| E1 Release  | E1 RELEASE REQUEST | E1 RELEASE RESPONSE |  |
| Bearer Context Setup | BEARER CONTEXT SETUP REQUEST | BEARER CONTEXT SETUP RESPONSE | BEARER CONTEXT SETUP FAILURE |
| Bearer Context Modification (gNB-CU-CP initiated) | BEARER CONTEXT MODIFICATION REQUEST | BEARER CONTEXT MODIFICATION RESPONSE | BEARER CONTEXT MODIFICATION FAILURE |
| Bearer Context Modification Required (gNB-CU-UP initiated) | BEARER CONTEXT MODIFICATION REQUIRED | BEARER CONTEXT MODIFICATION CONFIRM |  |
| Bearer Context Release (gNB-CU-CP initiated) | BEARER CONTEXT RELEASE COMMAND | BEARER CONTEXT RELEASE COMPLETE |  |
| IAB UP TNL Address Update | IAB UP TNL ADDRESS UPDATE | IAB UP TNL ADDRESS UPDATE ACKNOWLEDGE | IAB UP TNL ADDRESS UPDATE FAILURE |

**------------------------------------------------3rd Change -----------------------------------------------------**

## 8.3 Bearer Context Management procedures

### 8.3.1 Bearer Context Setup

#### 8.3.1.1 General

The purpose of the Bearer Context Setup procedure is to allow the gNB-CU-CP to establish a bearer context in the gNB-CU-UP. The procedure uses UE-associated signalling.

#### 8.3.1.2 Successful Operation



Figure 8.3.1.2-1: Bearer Context Setup procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the BEARER CONTEXT SETUP REQUEST message to the gNB-CU-UP. If the gNB-CU-UP succeeds to establish the requested resources, it replies to the gNB-CU-CP with the BEARER CONTEXT SETUP RESPONSE message.

The gNB-CU-UP shall report to the gNB-CU-CP, in the BEARER CONTEXT SETUP RESPONSE message, the result for all the requested resources in the following way:

For E-UTRAN:

- A list of DRBs which are successfully established shall be included in the *DRB Setup List* IE;

- A list of DRBs which failed to be established shall be included in the *DRB Failed List* IE;

For NG-RAN:

- A list of PDU Session Resources which are successfully established shall be included in the *PDU Session Resource Setup List* IE;

- A list of PDU Session Resources which failed to be established shall be included in the *PDU Session Resource Failed List* IE;

- For each established PDU Session Resource, a list of DRBs which are successfully established shall be included in the *DRB Setup List* IE;

- For each established PDU Session Resource, a list of DRBs which failed to be established shall be included in the *DRB Failed List* IE;

- For each established DRB, a list of QoS Flows which are successfully established shall be included in the *Flow Setup List* IE;

- For each established DRB, a list of QoS Flows which failed to be established shall be included in the *Flow Failed List* IE;

When the gNB-CU-UP reports the unsuccessful establishment of a PDU Session Resource, DRB or QoS Flow the cause value should be precise enough to enable the gNB-CU-CP to know the reason for the unsuccessful establishment.

If the *Existing Allocated S1 DL UP Transport Layer Information* IE or the *Existing Allocated NG DL UP Transport Layer Information* IE is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP may re-use the indicated resources already allocated for this bearer context. If the gNB-CU-UP decides to re-use the indicated resources, it shall include the *S1 DL UP Unchanged* IE or the *NG DL UP Unchanged* IE in the BEARER CONTEXT SETUP RESPONSE message.

If the *PDU Session Resource DL Aggregate Maximum Bit Rate* IE is contained in the *PDU Session Resource To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall store and use the information for the down link traffic policing for the Non-GBR QoS flows for the concerned UE as specified in TS 23.501 [20].

If the *Data Forwarding Information Request* IE, *PDU Session Data Forwarding Information Request* IE or the *DRB Data Forwarding Information Request* IE are included in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall include the requested forwarding information in the *Data Forwarding Information Response* IE, *PDU Session Data Forwarding Information Response* IE or the *DRB Data Forwarding Information Response* IE in the BEARER CONTEXT SETUP RESPONSE message.

If the *DL UP Parameters* IE is contained in the *DRB To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall configure the corresponding information.

For each PDU session for which the *Security Indication* IE is included in the *PDU Session Resource To Setup List* IE of the BEARER CONTEXT SETUP REQUEST message, and the *Integrity Protection Indication* IE or *Confidentiality Protection Indication* IE is set to "preferred", then the gNB-CU-UP should, if supported, perform user plane integrity protection or ciphering, respectively, for the concerned PDU session and shall notify whether it performed the user plane integrity protection or ciphering by including the *Integrity Protection Result* IE or *Confidentiality Protection Result* IE, respectively, in the *PDU Session Resource Setup List* IE of the BEARER CONTEXT SETUP RESPONSE message.

For each PDU session for which the *Security Indication* IE is included in the *PDU Session Resource To Setup List* IE of the BEARER CONTEXT SETUP REQUEST message, and the *Integrity Protection Indication* IE or *Confidentiality Protection Indication* IE is set to "required", then the gNB-CU-UP shall perform user plane integrity protection or ciphering, respectively, for the concerned PDU Session. If the gNB-CU-UP cannot perform the user plane integrity protection or ciphering, it shall reject the setup of the PDU Session Resources with an appropriate cause value.

For each PDU session for which the *Security Indication* IE is included in the *PDU Session Resource To Setup List* IE of the BEARER CONTEXT SETUP REQUEST message:

- if the *Integrity Protection Indication* IE is set to "not needed", then the gNB-CU-UP shall not perform user plane integrity protection for the concerned PDU session;

-if the *Confidentiality Protection Indication* IE is set to "not needed", then the gNB-CU-UP shall not perform user plane ciphering for the concerned PDU session.

If the *UE DL Maximum Integrity Protected Data Rate* IE is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall use this value when enforcing the maximum integrity protected data rate for the UE.

If the *Bearer Context Status Change* IE is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall consider the UE RRC state and act as specified in TS 38.401 [2].

For each requested DRB, if the *PDCP Duplication* IE is included in the *PDCP Configuration* IE contained in the BEARER CONTEXT SETUP REQUEST message, and one cell group is included in *Cell Group Information* IE, then the gNB-CU-UP shall include two *UP Transport Layer Information* IEs in the BEARER CONTEXT SETUP RESPONSE message to support packet duplication for intra-gNB-DU CA. The first *UP Transport Layer Information* IE of the two *UP Transport Layer Information* IEs is for the primary path.

If the *PDCP SN Status Information* IE is contained within the *DRB To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall take it into account and act as specified in TS 38.401 [2].

If the *QoS Flow Mapping Indication* IE is contained in the *QoS Flows Information To Be Setup* IE within the *DRB To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP may take it into account that only the uplink or downlink QoS flow is mapped to the DRB.

For each PDU Session Resource, if the *Network Instance* IE is included in the *PDU Session Resource To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message and the *Common Network Instance* IE is not included, the gNB-CU-UP shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [20].

For each PDU session, if the *Common Network Instance* IE is included in the *PDU Session Resource To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [20].

If *UE Inactivity Timer* IE or *PDU session Inactivity Timer* IE or *DRB Inactivity Timer* IE is contained in BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall take it into account when perform inactivity monitoring.

If the *DRB QoS* IE is contained within the *DRB To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, take it into account as specified in TS 28.552 [22].

If the *gNB-DU-ID* IE is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall store the information received.

If the *RAN UE ID* IE is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall store the information received.

For each successfully established DRB, the gNB-CU-UP shall provide, in the respective *UL UP Parameters* IE of the BEARER CONTEXT SETUP RESPONSE, one UL UP Transport Layer Information Item per cell group entry contained in the respective *Cell Group Information* IE of the BEARER CONTEXT SETUP REQUEST message.

If the *Trace Activation* IE is included in the BEARER CONTEXT SETUP REQUEST message the gNB-CU-UP shall, if supported, initiate the requested trace function as described in TS 32.422 [24].

For EN-DC, if the *Subscriber Profile ID for RAT/Frequency priority* IE is included in the UE CONTEXT SETUP REQUEST, the gNB-CU-UP may use it to apply specific RRM policies as specified in TS 36.300 [25]. If the *Additional RRM Policy Index* IE is included in the UE CONTEXT SETUP REQUEST, the gNB-CU-UP may use it to apply specific RRM policies as specified in TS 36.300 [25].

For each QoS flow whose DRB has been successfully established and the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall store this information, and, if supported, perform delay measurement and QoS monitoring, as specified in TS 23.501 [20].

For each requested DRB, if the *QoS Mapping Information* IE is contained in the *DL UP Parameters* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall use it to set DSCP and/or flow label fields for the downlink IP packets which are transmitted through the GTP tunnels indicated by the *UP Transport Layer Information* IE.

#### 8.3.1.3 Unsuccessful Operation



Figure 8.3.1.3-1: Bearer Context Setup procedure: Unsuccessful Operation.

If the gNB-CU-UP cannot establish the requested bearer context, or cannot even establish one bearer it shall consider the procedure as failed and respond with a BEARER CONTEXT SETUP FAILURE message and appropriate cause value.

#### 8.3.1.4 Abnormal Conditions

If the gNB-CU-UP receives a BEARER CONTEXT SETUP REQUEST message containing a *E-UTRAN QoS* IE in the *DRB To Setup List* IE for a GBR QoS DRB but where the *GBR QoS Information* IE is not present, the gNB-CU-UP shall report the establishment of the corresponding DRB as failed in the *DRB Failed List* IE of the BEARER CONTEXT SETUP RESPONSE message with an appropriate cause value.

If the gNB-CU-UP receives a BEARER CONTEXT SETUP REQUEST message containing a *QoS Flow Level QoS Parameters* IE in the *PDU Session Resource To Setup List* IE for a GBR QoS Flow but where the *GBR QoS Flow Information* IE is not present, the gNB-CU-UP shall report the establishment of the corresponding QoS Flow as failed in the corresponding *Flow Failed List* IE of the BEARER CONTEXT SETUP RESPONSE message with an appropriate cause value.

### 8.3.2 Bearer Context Modification (gNB-CU-CP initiated)

#### 8.3.2.1 General

The purpose of the Bearer Context Modification procedure is to allow the gNB-CU-CP to modify a bearer context in the gNB-CU-UP. The procedure uses UE-associated signalling.

#### 8.3.2.2 Successful Operation



Figure 8.3.2.2-1: Bearer Context Modification procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the BEARER CONTEXT MODIFICATION REQUEST message to the gNB-CU-UP. If the gNB-CU-UP succeeds to modify the bearer context, it replies to the gNB-CU-CP with the BEARER CONTEXT MODIFICATION RESPONSE message.

The gNB-CU-UP shall report to the gNB-CU-CP, in the BEARER CONTEXT MODIFICATION RESPONSE message, the result for all the requested resources in the following way:

For E-UTRAN:

- A list of DRBs which are successfully established shall be included in the *DRB Setup List* IE;

- A list of DRBs which failed to be established shall be included in the *DRB Failed List* IE;

- A list of DRBs which are successfully modified shall be included in the *DRB Modified List* IE;

- A list of DRBs which failed to be modified shall be included in the *DRB Failed To Modify List* IE;

For NG-RAN:

- A list of PDU Session Resources which are successfully established shall be included in the *PDU Session Resource Setup List* IE;

- A list of PDU Session Resources which failed to be established shall be included in the *PDU Session Resource Failed List* IE;

- A list of PDU Session Resources which are successfully modified shall be included in the *PDU Session Resource Modified List* IE;

- A list of PDU Session Resources which failed to be modified shall be included in the *PDU Session Resource Failed To Modify List* IE;

- For each successfully established or modified PDU Session Resource, a list of DRBs which are successfully established shall be included in the *DRB Setup List* IE;

- For each successfully established or modified PDU Session Resource, a list of DRBs which failed to be established shall be included in the *DRB Failed List* IE;

- For each successfully modified PDU Session Resource, a list of DRBs which are successfully modified shall be included in the *DRB Modified List* IE;

- For each successfully modified PDU Session Resource, a list of DRBs which failed to be modified shall be included in the *DRB Failed To Modify List* IE;

- For each successfully established or modified DRB, a list of QoS Flows which are successfully established shall be included in the *Flow Setup List* IE;

- For each successfully established or modified DRB, a list of QoS Flows which failed to be established shall be included in the *Flow Failed List* IE;

When the gNB-CU-UP reports the unsuccessful establishment of a PDU Session Resource, DRB or QoS Flow the cause value should be precise enough to enable the gNB-CU-CP to know the reason for the unsuccessful establishment.

If the *Security Information* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *UE DL Aggregate Maximum Bit Rate* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *UE DL Maximum Integrity Protected Data Rate* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *Bearer Context Status Change* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall consider the UE RRC state and act as specified in TS 38.401 [2].

If the *Data Forwarding Information Request* IE, *PDU Session Data Forwarding Information Request* IE or the *DRB Data Forwarding Information Request* IE are included in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall include the requested forwarding information in the *Data Forwarding Information Response* IE, *PDU Session Data Forwarding Information Response* IE or the *DRB Data Forwarding Information Response* IE in the BEARER CONTEXT MODIFICATION RESPONSE message.

If the *PDCP Configuration* IE is contained in the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information, except for the *PDCP SN UL Size* IE, the *PDCP SN DL Size* IE and the *RLC mode* IE which shall be ignored.

If the *E-UTRAN QoS* IE is contained in the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *PDCP SN Status Request* IE is contained in the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall include the *UL COUNT Value* IE and the *DL COUNT Value* IE in the BEARER CONTEXT MODIFICATION RESPONSE message.

If the *PDCP SN Status Information* IE is contained in the *DRB To Setup List* IE or the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall take it into account and act as specified in TS 38.401 [2].

If the *DL UP Parameters* IE is contained in the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *Cell Group To Add* IE or the *Cell Group To Modify* IE or the *Cell Group To Remove* IE is contained in the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall add or modify or remove the corresponding cell group.

If the *PDU Session Resource DL Aggregate Maximum Bit Rate* IE is contained in the *PDU Session Resource To Setup List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall replace the information in the UE context and use it when enforcing downlink traffic policing for the non GBR QoS flows for the concerned UE, as specified in TS 23.501 [20].

If the *PDU Session Resource DL Aggregate Maximum Bit Rate* IE is contained in the *PDU Session Resource To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *SDAP Configuration* IE is contained in the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *Flow Mapping Information* IE is contained in the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

For each requested DRB, if the *PDCP Duplication* IE is included in the *PDCP Configuration* IE contained in the BEARER CONTEXT MODIFICATION REQUEST message, and one cell group is included in *Cell Group Information* IE, then the gNB-CU-CP shall include two *UP Transport Layer Information* IEs in the BEARER CONTEXT MODIFICATION REQUEST message, and the gNB-CU-UP shall also include two *UP Transport Layer Information* IEs in the BEARER CONTEXT MODIFICATION RESPONSE message to support packet duplication for intra-gNB-DU CA. The first *UP Transport Layer Information* IE of the two *UP Transport Layer Information* IEs is for the primary path.

For a certain DRB which was allocated with two GTP-U tunnels, if such DRB is modified and given one GTP-U tunnel via the Bearer Context Modification (gNB-CU-CP initiated) procedure, i.e. only one UP Transport Layer Information per Cell Group ID is present in *DL UP Parameters* IE for the concerned DRB, then the gNB-CU-UP shall consider that PDCP duplication is deconfigured for this DRB. If such Bearer Context Modification (gNB-CU-CP initiated) procedure occurs, the *Duplication Activation* IE shall not be included for the concerned DRB.

If the *New UL TNL Information Required* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall include the new UP Transport Layer Information in the BEARER CONTEXT MODIFICATION RESPONSE message.

For each PDU session for which the *Security Indication* IE is included in the *PDU Session Resource To Setup List* IE of the BEARER CONTEXT MODIFICATION REQUEST message, and the *Integrity Protection Indication* IE or *Confidentiality Protection Indication* IE is set to "preferred", then the gNB-CU-UP should, if supported, perform user plane integrity protection or ciphering, respectively, for the concerned PDU session and shall notify whether it performed the user plane integrity protection or ciphering by including the *Integrity Protection Result* IE or *Confidentiality Protection Result* IE, respectively, in the *PDU Session Resource Setup List* IE of the BEARER CONTEXT MODIFICATION RESPONSE message.

For each PDU session for which the *Security Indication* IE is included in the *PDU Session Resource To Setup List* IE of the BEARER CONTEXT MODIFICATION REQUEST message, and the *Integrity Protection Indication* IE or *Confidentiality Protection Indication* IE is set to "required", then the gNB-CU-UP shall perform user plane integrity protection or ciphering, respectively, for the concerned PDU Session. If the gNB-CU-UP cannot perform the user plane integrity protection or ciphering, it shall reject the setup of the PDU Session Resources with an appropriate cause value.

For each PDU session for which the Security Indication IE is included in the *PDU Session Resource To Setup List* of the BEARER CONTEXT MODIFICATION REQUEST message:

- if the *Integrity Protection Indication* IE is set to "not needed", then the gNB-CU-UP shall not perform user plane integrity protection for the concerned PDU session;

-if the *Confidentiality Protection Indication* IE is set to "not needed", then the gNB-CU-UP shall not perform user plane ciphering for the concerned PDU session.

For each PDU Session Resource, if the *Network Instance* IE is included in the *PDU Session Resource To Setup List* IE or the *PDU Session Resource To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message and the *Common Network Instance* IE is not included, the gNB-CU-UP shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [20].

For each PDU session, if the *Common Network Instance* IE is included in the *PDU Session Resource To Setup List* IE or the *PDU Session Resource To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [20].

If the *QoS Flow Mapping Indication* IE is contained in the *QoS Flow QoS Parameters List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, replace any previously received value and take it into account that only the uplink or downlink QoS flow is mapped to the DRB.

If the *Data Discard Required* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message and the value is set to “Required”, the gNB-CU-UP shall consider that a RAN Paging Failure occurred for that UE. The gNB-CU-UP shall discard the user plane data for that UE and consider that the bearer context is still suspended.

If *UE Inactivity Timer* IE or *PDU session Inactivity Timer* IE or *DRB Inactivity Timer* IE is contained in BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall take it into account when perform inactivity monitoring.

If the *S-NSSAI* IE is contained in the *PDU Session Resource To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall store the corresponding information and replace any existing information.

If the *DRB QoS* IE is contained within the *DRB To Setup List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, take it into account for each DRB, as specified in TS 28.552 [22].

If the *DRB QoS* IE is contained within the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, replace any previously received value and take it into account for each DRB, as specifed in TS 28.552 [22].

If the *gNB-DU-ID* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall store and replace any previous information received.

If the *RAN UE ID* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall store and replace any previous information received.

If the gNB-CU-UP receives a BEARER CONTEXT MODIFICATION REQUEST message including *Activity Notification Level* IE and its value does not match the current bearer context, the gNB-CU-UP shall ignore the *Activity Notification Level* IE and also the requested modification of inactivity timer.

For each successfully established DRB, the gNB-CU-UP shall provide, in the respective *UL UP Parameters* IE of the BEARER CONTEXT MODIFICATION RESPONSE, one UL UP Transport Layer Information Item per cell group entry contained in the respective *Cell Group Information* IE of the BEARER CONTEXT MODIFICATION REQUEST message.

If the *Old QoS Flow List - UL End Marker expected* IE is included in the *PDU Session Resource To Modify List* IE of the BEARER CONTEXT MODIFICATION REQUEST message for a DRB to be modified, the gNB-CU-UP shall consider that the source NG-RAN node has initiated QoS flow re-mapping and has not yet received SDAP end markers, as described in TS 38.300 [8]. The gNB-CU-UP shall consider that the *Old QoS Flow List - UL End Marker expected* IE only contains UL QoS flow information for QoS flows for which no SDAP end marker has been yet received on the source side.

For EN-DC, if the *Subscriber Profile ID for RAT/Frequency priority* IE is included in the UE CONTEXT MODIFICATION REQUEST, the gNB-CU-UP may use it to apply specific RRM policies as specified in TS 36.300 [25]. If the *Additional RRM Policy Index* IE is included in the UE CONTEXT MODIFICATION REQUEST, the gNB-CU-UP may use it to apply specific RRM policies as specified in TS 36.300 [25].

If there is at least one DRB removed by the gNB-CU-UP, the gNB-CU-UP shall, if supported, include the *Retainability Measurements Information* IE in the BEARER CONTEXT MODIFICATION RESPONSE message, providing information on the removed DRB(s) for retainability measurements in the gNB-CU-CP, as described in TS 32.425 [26] and TS 28.552 [22].

For each QoS flow whose DRB has been successfully established or modified and the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall store this information, and, if supported, perform delay measurement and QoS monitoring, as specified in TS 23.501 [20].

For each requested DRB, if the *QoS Mapping Information* IE is contained in the *DL UP Parameters* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall use it to set DSCP and/or flow label fields for the downlink IP packets which are transmitted through the GTP tunnels indicated by the *UP Transport Layer Information* IE.

#### 8.3.2.3 Unsuccessful Operation



Figure 8.3.2.3-1: Bearer Context Modification procedure: Unsuccessful Operation.

If the gNB-CU-UP cannot successfully perform any of the requested bearer context modifications, it shall respond with a BEARER CONTEXT MODIFICATION FAILURE message and appropriate cause value.

#### 8.3.2.4 Abnormal Conditions

If the gNB-CU-UP receives a BEARER CONTEXT MODIFICATION REQUEST message containing a *E-UTRAN QoS* IE in the *DRB To Setup List* or the *DRB To Modify List* IE for a GBR QoS DRB but where the *GBR QoS Information* IE is not present, the gNB-CU-UP shall report the addition or the modification of the corresponding DRB as failed in the *DRB Failed List* IE or the *DRB Failed To Modify List* IE of the BEARER CONTEXT MODIFICATION RESPONSE message with an appropriate cause value.

If the gNB-CU-UP receives a BEARER CONTEXT MODIFICATION REQUEST message containing a *QoS Flow Level QoS Parameters* IE in the *PDU Session Resource To Setup List* IE or the *PDU Session Resource To Modify List* IE for a GBR QoS Flow but where the *GBR QoS Flow Information* IE is not present, the gNB-CU-UP shall report the addition or the modification of the corresponding QoS Flow as failed in the corresponding *Flow Failed List* IE of the BEARER CONTEXT MODIFICATION RESPONSE message with an appropriate cause value.

**------------------------------------------------4th Change -----------------------------------------------------**

8.x IAB Procedures

8.x.1 IAB UP TNL Address Update

8.x.1.1 General

The purpose of the IAB UP TNL Address Update procedure is to allow the gNB-CU-CP to request the gNB-CU-UP to update the TNL Address(es) for all the DL F1-U GTP-U tunnels related to a TNL address, and allow the gNB-CU-UP to inform gNB-CU-CP the updated TNL Address(es) for all the UL F1-U GTP-U tunnels. The procedure uses non-UE associated signalling.

NOTE: This procedure is applicable for IAB-nodes, where the term “gNB-CU-CP” applies to IAB-donor-CU-CP, and the term “gNB-CU-UP” applies to IAB-donor-CU-UP.

NOTE: Implementation must ensure the avoidance of potential race conditions, i.e. it must ensure that the UP configuration (e.g., UL/DL UP TNL address) update is not concurrently performed using the non-UE-associated IAB UP TNL Address Update procedure and the UE-associated procedures for Bearer Context Management.

8.x.1.2 Successful Operation

IAB UP TNL ADDRESS UPDATE ACKNOWLEDGE

IAB UP TNL ADDRESS UPDATE

gNB-CU-CP

gNB-CU-UP

**Figure 8.x.1.2-1: IAB UP TNL Address Update procedure: Successful Operation.**

Upon reception of the IAB UP TNL ADDRESS UPDATE message, if the *DL UP TNL Address to Update List* IE is contained, the gNB-CU-UP shall replace the old TNL Address(es) by the new TNL Address(es) for all the maintained DL F1-U GTP tunnels corresponding to the old TNL Address(es).

If the *UL UP TNL Address to Update List* IE is contained in the IAB UP TNL ADDRESS UPDATE ACKNOWLEDGE message, the gNB-CU-CP shall take the new TNL address(es) as replacement for each corresponding old TNL address(es).

8.x.1.3 Unsuccessful Operation

IAB UP TNL ADDRESS UPDATE FAILURE

IAB UP TNL ADDRESS UPDATE

gNB-CU-CP

gNB-CU-UP

**Figure 8.x.1.3-1: IAB UP TNL Address Update procedure: Unsuccessful Operation.**

If the gNB-CU-UP receives an IAB UP TNL ADDRESS UPDATE message, but cannot perform the update accordingly, it shall consider the update procedure as failed and respond with an IAB UP TNL ADDRESS UPDATE FAILURE message and appropriate cause value.

If the IAB UP TNL ADDRESS UPDATE FAILURE message includes the *Time To Wait* IE, the gNB-CU-CP shall wait at least for the indicated time before reinitiating the UP TNL address update towards the same gNB-CU-UP.

8.x.1.4 Abnormal Conditions

Not Applicable.

**------------------------------------------------5th Change -----------------------------------------------------**

9 Elements for E1AP communication

9.1 General

>>>>>>>>unchanged parts are skipped<<<<<<<<

9.2.x IAB Messages

9.2.x.1 IAB UP TNL ADDRESS UPDATE

This message is sent by the gNB-CU-CP to request the gNB-CU-UP to update the TNL address(es) of the DL F1-U GTP tunnel information.

Direction: gNB-CU-CP → gNB-CU-UP

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| Message Type | M |  | 9.3.1.1 |  | YES | reject |
| Transaction ID | M |  | 9.3.1.53 |  | YES | reject |
| **DL UP TNL Address To Update List** |  | *0..1* |  |  | YES | reject |
| **> DL UP TNL Address To Update Item IEs** |  | *1..<maxnoofTNLAddresses>* |  |  | - | - |
| >>Old TNL Address | M |  | 9.3.2.4 | The old Transport Layer Address of IAB-DU for DL F1-U GTP tunnel. | - | - |
| >>New TNL Address | M |  | 9.3.2.4 | The new Transport Layer Address of IAB-DU for DL F1-U GTP tunnel. | - | - |

|  |  |
| --- | --- |
| **Range bound** | **Explanation** |
| maxnoofTNLAddresses | Maximum no. of TNL addresses to be updated in one E1AP procedure. Value is 8. |

9.2.x.2 IAB UP TNL ADDRESS UPDATE ACKNOWLEDGE

This message is sent by the gNB-CU-UP to the gNB-CU-CP to acknowledge the update of TNL address in DL F1-U GTP tunnel information, or provide the updated TNL address(es) of the UL F1-U GTP tunnel information.

Direction: gNB-CU-UP → gNB-CU-CP

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| Message Type | M |  | 9.3.1.1 |  | YES | reject |
| Transaction ID | M |  | 9.3.1.53 |  | YES | reject |
| Criticality Diagnostics | O |  | 9.3.1.3 |  | YES | ignore |
| **UL UP TNL Address to Update List** |  | *0..1* |  |  | YES | ignore |
| **> UL UP TNL Address Updated Item IEs** |  | *1..<maxnoofTNLAddresses>* |  |  | - | - |
| >>Old TNL Address | M |  | 9.3.2.4 | The old Transport Layer Address of CU-UP for UL F1-U GTP tunnel. | - | - |
| >>New TNL Address | M |  | 9.3.2.4 | The new Transport Layer Address of CU-UP for UL F1-U GTP tunnel. | - | - |

|  |  |
| --- | --- |
| **Range bound** | **Explanation** |
| maxnoofTNLAddresses | Maximum no. of TNL addresses updated in one E1AP procedure. Value is 8. |

9.2.x.3 IAB UP TNL ADDRESS UPDATE FAILURE

This message is sent by the gNB-CU-UP to indicate IAB UP TNL address Update failure.

Direction: gNB-CU-UP → gNB-CU-CP

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| Message Type | M |  | 9.3.1.1 |  | YES | reject |
| Transaction ID | M |  | 9.3.1.53 |  | YES | reject |
| Cause | M |  | 9.3.1.2 |  | YES | ignore |
| Time To wait | O |  | 9.3.1.6 |  | YES | ignore |
| Criticality Diagnostics | O |  | 9.3.1.3 |  | YES | ignore |

**------------------------------------------------6th Change -----------------------------------------------------**

## 9.3 Information Element Definitions

### 9.3.1Radio Network Layer Related IEs

>>>>>>>>unchanged parts are skipped<<<<<<<<

9.3.1.2 Cause

The purpose of the *Cause* IE is to indicate the reason for a particular event for the E1AP protocol.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| CHOICE *Cause Group* | M |  |  |  |
| >*Radio Network Layer* |  |  |  |  |
| >>Radio Network Layer Cause  | M |  | ENUMERATED(Unspecified, Unknown or already allocated gNB-CU-CP UE E1AP ID, Unknown or already allocated gNB-CU-UP UE E1AP ID, Unknown or inconsistent pair of UE E1AP ID, Interaction with other procedure, PDCP Count Wrap Around, Not supported QCI value,Not supported 5QI value,Encryption algorithms not supported,Integrity protection algorithms not supported,UP integrity protection not possible, UP confidentiality protection not possible,Multiple PDU Session ID Instances,Unknown PDU Session ID,Multiple QoS Flow ID Instances,Unknown QoS Flow ID,Multiple DRB ID Instances,Unknown DRB ID,Invalid QoS combination,Procedure cancelled,Normal release,No radio resources available,Action desirable for radio reasons,Resources not available for the slice,PDCP configuration not supported,…,UE DL maximum integrity protected data rate reason,UP integrity protection failure, Release due to Pre-Emption) |  |
| *>Transport Layer* |  |  |  |  |
| >>Transport Layer Cause | M |  | ENUMERATED(Unspecified, Transport Resource Unavailable,…,Unknown TNL address for IAB) |  |
| *>Protocol* |  |  |  |  |
| >>Protocol Cause | M |  | ENUMERATED(Transfer Syntax Error,Abstract Syntax Error (Reject),Abstract Syntax Error (Ignore and Notify),Message not Compatible with Receiver State,Semantic Error,Abstract Syntax Error (Falsely Constructed Message), Unspecified, …) |  |
| *>Misc* |  |  |  |  |
| >>Miscellaneous Cause | M |  | ENUMERATED(Control Processing Overload, Not enough User Plane Processing Resources,Hardware Failure,O&M Intervention,Unspecified, …) |  |

The meaning of the different cause values is described in the following table. In general, "not supported" cause values indicate that the related capability is missing. On the other hand, "not available" cause values indicate that the related capability is present, but insufficient resources were available to perform the requested action.

|  |  |
| --- | --- |
| **Radio Network Layer cause** | **Meaning** |
| Unspecified | Sent for radio network layer cause when none of the specified cause values applies. |
| Unknown or already allocated gNB-CU-CP UE E1AP ID | The action failed because the gNB-CU-CP UE E1AP ID is either unknown, or (for a first message received at the gNB-CU) is known and already allocated to an existing context. |
| Unknown or already allocated gNB-CU-UP UE E1AP ID | The action failed because the gNB-CU-UP UE E1AP ID is either unknown, or (for a first message received at the gNB-CU-UP) is known and already allocated to an existing context. |
| Unknown or inconsistent pair of UE E1AP ID | The action failed because both UE E1AP IDs are unknown, or are known but do not define a single UE context. |
| Interaction with other procedure | The action is due to an ongoing interaction with another procedure. |
| PDCP COUNT wrap around | PDCP COUNT approaches the maximum value. |
| Not supported QCI value | The action failed because the requested QCI is not supported. |
| Not supported 5QI value | The action failed because the requested 5QI is not supported. |
| Encryption algorithms not supported | The gNB-CU-UP is unable to support the selected encryption algorithm for the UE. |
| Integrity protection algorithms not supported | The gNB-CU-UP is unable to support the selected integrity protection algorithm for the UE. |
| UP integrity protection not possible  | The PDU Session cannot be accepted according to the required user plane integrity protection policy. |
| UP confidentiality protection not possible | The PDU Session cannot be accepted according to the required user plane confidentiality protection policy |
| Multiple PDU Session ID Instances | The action failed because multiple instances of the same PDU Session had been provided. |
| Unknown PDU Session ID | The action failed because the PDU Session ID is unknown. |
| Multiple QoS Flow ID Instances | The action failed because multiple instances of the same QoS flow had been provided. |
| Unknown QoS Flow ID | The action failed because the QoS Flow ID is unknow. |
| Multiple DRB ID Instances | The action failed because multiple instances of the same DRB had been provided. |
| Unknown DRB ID | The action failed because the DRB ID is unknow. |
| Invalid QoS combination | The action was failed because of invalid QoS combination |
| Procedure cancelled | The sending node cancelled the procedure due to other urgent actions to be performed. |
| Normal release | The action is due to a normal release of the UE (e.g. because of mobility) and does not indicate an error. |
| No radio resources available | The requested node doesn’t have sufficient radio resources available. |
| Action desirable for radio reasons | The reason for requesting the action is radio related. |
| Resources not available for the slice | The requested resources are not available for the slice. |
| PDCP configuration not supported, | The gNB-CU-UP is unable to support the selected PDCP configuration for the UE. |
| UE DL maximum integrity protected data rate reason | The request is not accepted in order to comply with the maximum downlink data rate for integrity protection supported by the UE. |
| UP integrity protection failure | The gNB-CU-UP detects an integrity protection failure in the UL PDU. |
| Release due to Pre-Emption | Release is initiated due to pre-emption. |

|  |  |
| --- | --- |
| **Transport Layer cause** | **Meaning** |
| Unspecified | Sent when none of the above cause values applies but still the cause is Transport Network Layer related. |
| Transport Resource Unavailable | The required transport resources are not available. |
| Unknown TNL address for IAB | The action failed because the TNL address is unknown.It is applicable for IAB only. |

|  |  |
| --- | --- |
| **Protocol cause** | **Meaning** |
| Transfer Syntax Error | The received message included a transfer syntax error. |
| Abstract Syntax Error (Reject) | The received message included an abstract syntax error and the concerning criticality indicated "reject". |
| Abstract Syntax Error (Ignore And Notify) | The received message included an abstract syntax error and the concerning criticality indicated "ignore and notify". |
| Message Not Compatible With Receiver State | The received message was not compatible with the receiver state. |
| Semantic Error | The received message included a semantic error. |
| Abstract Syntax Error (Falsely Constructed Message) | The received message contained IEs or IE groups in wrong order or with too many occurrences. |
| Unspecified | Sent when none of the above cause values applies but still the cause is Protocol related. |

| **Miscellaneous cause** | **Meaning** |
| --- | --- |
| Control Processing Overload | Control processing overload. |
| Not EnoughUser Plane Processing Resources Available | No enough resources are available related to user plane processing. |
| Hardware Failure | Action related to hardware failure. |
| O&M Intervention | The action is due to O&M intervention. |
| Unspecified Failure | Sent when none of the above cause values applies and the cause is not related to any of the categories Radio Network Layer, Transport Network Layer, NAS or Protocol. |

>>>>>>>>unchanged parts are skipped<<<<<<<<

#### 9.3.1.13 UP Parameters

This IE provides information related to a DRB configured in the gNB-CU-UP.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| **UP Parameters List** |  | *1* |  |  | - | - |
| **>UP Parameters Item** |  | *1..<maxnoofUPParameters>* |  |  | - | - |
| >>UP Transport Layer Information | M |  | 9.3.2.1 |  | - | - |
| >>Cell Group ID  | M |  | INTEGER (0..3, …) | Cell group ID as defined in TS 38.331 [10] (0=MCG, 1=SCG). In this version of the specification, values “2” and “3” are not used. | - | - |
| >>QoS Mapping Information  | O |  | 9.3.1.X |  | YES | reject |

|  |  |
| --- | --- |
| **Range bound** | **Explanation** |
| maxnoofUPParameters | Maximum no. of UP parameters (e.g., GTP tunnels) for a DRB. Value is 8 |

>>>>>>>>unchanged parts are skipped<<<<<<<<

#### 9.3.1.X QoS Mapping Information

This IE indicates the DSCP and/or IPv6 Flow Label field(s) of IP packet which is corresponding to the GTP-U tunnel of requested DRB.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| DSCP | O |  | BIT STRING (SIZE(6)) |  |
| Flow Label  | O |  | BIT STRING (SIZE(20)) |  |

**------------------------------------------------7th Change -----------------------------------------------------**

9.4.3 Elementary Procedure Definitions

-- ASN1START

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

--

-- Elementary Procedure definitions

--

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

E1AP-PDU-Descriptions {

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

ngran-access (22) modules (3) e1ap (5) version1 (1) e1ap-PDU-Descriptions (0) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

--

-- IE parameter types from other modules

--

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

IMPORTS

 Criticality,

 ProcedureCode

FROM E1AP-CommonDataTypes

 Reset,

 ResetAcknowledge,

 ErrorIndication,

 GNB-CU-UP-E1SetupRequest,

 GNB-CU-UP-E1SetupResponse,

 GNB-CU-UP-E1SetupFailure,

 GNB-CU-CP-E1SetupRequest,

 GNB-CU-CP-E1SetupResponse,

 GNB-CU-CP-E1SetupFailure,

 GNB-CU-UP-ConfigurationUpdate,

 GNB-CU-UP-ConfigurationUpdateAcknowledge,

 GNB-CU-UP-ConfigurationUpdateFailure,

 GNB-CU-CP-ConfigurationUpdate,

 GNB-CU-CP-ConfigurationUpdateAcknowledge,

 GNB-CU-CP-ConfigurationUpdateFailure,

 BearerContextSetupRequest,

 BearerContextSetupResponse,

 BearerContextSetupFailure,

 BearerContextModificationRequest,

 BearerContextModificationResponse,

 BearerContextModificationFailure,

 BearerContextModificationRequired,

 BearerContextModificationConfirm,

 BearerContextReleaseCommand,

 BearerContextReleaseComplete,

 BearerContextReleaseRequest,

 BearerContextInactivityNotification,

 DLDataNotification,

 ULDataNotification,

 DataUsageReport,

 E1ReleaseRequest,

 E1ReleaseResponse,

 GNB-CU-UP-CounterCheckRequest,

 GNB-CU-UP-StatusIndication,

 MRDC-DataUsageReport,

 DeactivateTrace,

 TraceStart,

 PrivateMessage,

 IAB-UPTNLAddressUpdate,

 IAB-UPTNLAddressUpdateAcknowledge,

 IAB-UPTNLAddressUpdateFailure

FROM E1AP-PDU-Contents

 id-reset,

 id-errorIndication,

 id-gNB-CU-UP-E1Setup,

 id-gNB-CU-CP-E1Setup,

 id-gNB-CU-UP-ConfigurationUpdate,

 id-gNB-CU-CP-ConfigurationUpdate,

 id-e1Release,

 id-bearerContextSetup,

 id-bearerContextModification,

 id-bearerContextModificationRequired,

 id-bearerContextRelease,

 id-bearerContextReleaseRequest,

 id-bearerContextInactivityNotification,

 id-dLDataNotification,

 id-uLDataNotification,

 id-dataUsageReport,

 id-gNB-CU-UP-CounterCheck,

 id-gNB-CU-UP-StatusIndication,

 id-mRDC-DataUsageReport,

 id-DeactivateTrace,

 id-TraceStart,

 id-privateMessage,

 id-iAB-UPTNLAddressUpdate

FROM E1AP-Constants;

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

--

-- Interface Elementary Procedure Class

--

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

E1AP-ELEMENTARY-PROCEDURE ::= CLASS {

 &InitiatingMessage ,

 &SuccessfulOutcome OPTIONAL,

&UnsuccessfulOutcome OPTIONAL,

 &procedureCode ProcedureCode UNIQUE,

 &criticality Criticality DEFAULT ignore

}

WITH SYNTAX {

 INITIATING MESSAGE &InitiatingMessage

 [SUCCESSFUL OUTCOME &SuccessfulOutcome]

 [UNSUCCESSFUL OUTCOME &UnsuccessfulOutcome]

 PROCEDURE CODE &procedureCode

 [CRITICALITY &criticality]

}

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

--

-- Interface PDU Definition

--

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

E1AP-PDU ::= CHOICE {

 initiatingMessage InitiatingMessage,

 successfulOutcome SuccessfulOutcome,

 unsuccessfulOutcome UnsuccessfulOutcome,

 ...

}

InitiatingMessage ::= SEQUENCE {

 procedureCode E1AP-ELEMENTARY-PROCEDURE.&procedureCode ({E1AP-ELEMENTARY-PROCEDURES}),

 criticality E1AP-ELEMENTARY-PROCEDURE.&criticality ({E1AP-ELEMENTARY-PROCEDURES}{@procedureCode}),

 value E1AP-ELEMENTARY-PROCEDURE.&InitiatingMessage ({E1AP-ELEMENTARY-PROCEDURES}{@procedureCode})

}

SuccessfulOutcome ::= SEQUENCE {

 procedureCode E1AP-ELEMENTARY-PROCEDURE.&procedureCode ({E1AP-ELEMENTARY-PROCEDURES}),

 criticality E1AP-ELEMENTARY-PROCEDURE.&criticality ({E1AP-ELEMENTARY-PROCEDURES}{@procedureCode}),

 value E1AP-ELEMENTARY-PROCEDURE.&SuccessfulOutcome ({E1AP-ELEMENTARY-PROCEDURES}{@procedureCode})

}

UnsuccessfulOutcome ::= SEQUENCE {

 procedureCode E1AP-ELEMENTARY-PROCEDURE.&procedureCode ({E1AP-ELEMENTARY-PROCEDURES}),

 criticality E1AP-ELEMENTARY-PROCEDURE.&criticality ({E1AP-ELEMENTARY-PROCEDURES}{@procedureCode}),

 value E1AP-ELEMENTARY-PROCEDURE.&UnsuccessfulOutcome ({E1AP-ELEMENTARY-PROCEDURES}{@procedureCode})

}

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

--

-- Interface Elementary Procedure List

--

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

E1AP-ELEMENTARY-PROCEDURES E1AP-ELEMENTARY-PROCEDURE ::= {

 E1AP-ELEMENTARY-PROCEDURES-CLASS-1 |

 E1AP-ELEMENTARY-PROCEDURES-CLASS-2 ,

 ...

}

E1AP-ELEMENTARY-PROCEDURES-CLASS-1 E1AP-ELEMENTARY-PROCEDURE ::= {

 reset |

 gNB-CU-UP-E1Setup |

 gNB-CU-CP-E1Setup |

 gNB-CU-UP-ConfigurationUpdate |

 gNB-CU-CP-ConfigurationUpdate |

 e1Release |

 bearerContextSetup |

 bearerContextModification |

 bearerContextModificationRequired |

 bearerContextRelease |

 iAB-UPTNLAddressUpdate ,

 ...

}

E1AP-ELEMENTARY-PROCEDURES-CLASS-2 E1AP-ELEMENTARY-PROCEDURE ::= {

 errorIndication |

 bearerContextReleaseRequest |

 bearerContextInactivityNotification |

 dLDataNotification |

 uLDataNotification |

 dataUsageReport |

 gNB-CU-UP-CounterCheck |

 gNB-CU-UP-StatusIndication |

 mRDC-DataUsageReport |

 deactivateTrace |

 traceStart |

 privateMessage ,

 ...

}

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

--

-- Interface Elementary Procedures

--

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

reset E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE Reset

 SUCCESSFUL OUTCOME ResetAcknowledge

 PROCEDURE CODE id-reset

 CRITICALITY reject

}

errorIndication E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE ErrorIndication

 PROCEDURE CODE id-errorIndication

 CRITICALITY ignore

}

gNB-CU-UP-E1Setup E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE GNB-CU-UP-E1SetupRequest

 SUCCESSFUL OUTCOME GNB-CU-UP-E1SetupResponse

 UNSUCCESSFUL OUTCOME GNB-CU-UP-E1SetupFailure

 PROCEDURE CODE id-gNB-CU-UP-E1Setup

 CRITICALITY reject

}

gNB-CU-CP-E1Setup E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE GNB-CU-CP-E1SetupRequest

 SUCCESSFUL OUTCOME GNB-CU-CP-E1SetupResponse

 UNSUCCESSFUL OUTCOME GNB-CU-CP-E1SetupFailure

 PROCEDURE CODE id-gNB-CU-CP-E1Setup

 CRITICALITY reject

}

gNB-CU-UP-ConfigurationUpdate E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE GNB-CU-UP-ConfigurationUpdate

 SUCCESSFUL OUTCOME GNB-CU-UP-ConfigurationUpdateAcknowledge

 UNSUCCESSFUL OUTCOME GNB-CU-UP-ConfigurationUpdateFailure

 PROCEDURE CODE id-gNB-CU-UP-ConfigurationUpdate

 CRITICALITY reject

}

gNB-CU-CP-ConfigurationUpdate E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE GNB-CU-CP-ConfigurationUpdate

 SUCCESSFUL OUTCOME GNB-CU-CP-ConfigurationUpdateAcknowledge

 UNSUCCESSFUL OUTCOME GNB-CU-CP-ConfigurationUpdateFailure

 PROCEDURE CODE id-gNB-CU-CP-ConfigurationUpdate

 CRITICALITY reject

}

e1Release E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE E1ReleaseRequest

 SUCCESSFUL OUTCOME E1ReleaseResponse

 PROCEDURE CODE id-e1Release

 CRITICALITY reject

}

bearerContextSetup E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE BearerContextSetupRequest

 SUCCESSFUL OUTCOME BearerContextSetupResponse

 UNSUCCESSFUL OUTCOME BearerContextSetupFailure

 PROCEDURE CODE id-bearerContextSetup

 CRITICALITY reject

}

bearerContextModification E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE BearerContextModificationRequest

 SUCCESSFUL OUTCOME BearerContextModificationResponse

 UNSUCCESSFUL OUTCOME BearerContextModificationFailure

 PROCEDURE CODE id-bearerContextModification

 CRITICALITY reject

}

bearerContextModificationRequired E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE BearerContextModificationRequired

 SUCCESSFUL OUTCOME BearerContextModificationConfirm

 PROCEDURE CODE id-bearerContextModificationRequired

 CRITICALITY reject

}

bearerContextRelease E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE BearerContextReleaseCommand

 SUCCESSFUL OUTCOME BearerContextReleaseComplete

 PROCEDURE CODE id-bearerContextRelease

 CRITICALITY reject

}

bearerContextReleaseRequest E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE BearerContextReleaseRequest

 PROCEDURE CODE id-bearerContextReleaseRequest

 CRITICALITY ignore

}

bearerContextInactivityNotification E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE BearerContextInactivityNotification

 PROCEDURE CODE id-bearerContextInactivityNotification

 CRITICALITY ignore

}

dLDataNotification E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE DLDataNotification

 PROCEDURE CODE id-dLDataNotification

 CRITICALITY ignore

}

uLDataNotification E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE ULDataNotification

 PROCEDURE CODE id-uLDataNotification

 CRITICALITY ignore

}

dataUsageReport E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE DataUsageReport

 PROCEDURE CODE id-dataUsageReport

 CRITICALITY ignore

}

gNB-CU-UP-CounterCheck E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE GNB-CU-UP-CounterCheckRequest

 PROCEDURE CODE id-gNB-CU-UP-CounterCheck

 CRITICALITY ignore

}

gNB-CU-UP-StatusIndication E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE GNB-CU-UP-StatusIndication

 PROCEDURE CODE id-gNB-CU-UP-StatusIndication

 CRITICALITY ignore

}

privateMessage E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE PrivateMessage

 PROCEDURE CODE id-privateMessage

 CRITICALITY ignore

}

mRDC-DataUsageReport E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE MRDC-DataUsageReport

 PROCEDURE CODE id-mRDC-DataUsageReport

 CRITICALITY ignore

}

deactivateTrace E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE DeactivateTrace

 PROCEDURE CODE id-DeactivateTrace

 CRITICALITY ignore

}

traceStart E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE TraceStart

 PROCEDURE CODE id-TraceStart

 CRITICALITY ignore

}

iAB-UPTNLAddressUpdate E1AP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE IAB-UPTNLAddressUpdate

 SUCCESSFUL OUTCOME IAB-UPTNLAddressUpdateAcknowledge

 UNSUCCESSFUL OUTCOME IAB-UPTNLAddressUpdateFailure

 PROCEDURE CODE id-iAB-UPTNLAddressUpdate

 CRITICALITY reject

}

END

-- ASN1STOP

9.4.4 PDU Definitions

-- ASN1START

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

--

-- PDU definitions for E1AP

--

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

E1AP-PDU-Contents {

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

ngran-access (22) modules (3) e1ap (5) version1 (1) e1ap-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

--

-- IE parameter types from other modules

--

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

IMPORTS

 Cause,

 CriticalityDiagnostics,

 GNB-CU-CP-UE-E1AP-ID,

 GNB-CU-UP-UE-E1AP-ID,

 UE-associatedLogicalE1-ConnectionItem,

 GNB-CU-UP-ID,

 GNB-CU-UP-Name,

 GNB-CU-CP-Name,

 CNSupport,

 PLMN-Identity,

 Slice-Support-List,

 NR-CGI-Support-List,

 QoS-Parameters-Support-List,

 SecurityInformation,

 BitRate,

 BearerContextStatusChange,

 DRB-To-Setup-List-EUTRAN,

 DRB-Setup-List-EUTRAN,

 DRB-Failed-List-EUTRAN,

 DRB-To-Modify-List-EUTRAN,

 DRB-Modified-List-EUTRAN,

 DRB-Failed-To-Modify-List-EUTRAN,

 DRB-To-Remove-List-EUTRAN,

 DRB-Required-To-Remove-List-EUTRAN,

 DRB-Required-To-Modify-List-EUTRAN,

 DRB-Confirm-Modified-List-EUTRAN,

 DRB-To-Setup-Mod-List-EUTRAN,

 DRB-Setup-Mod-List-EUTRAN,

 DRB-Failed-Mod-List-EUTRAN,

 PDU-Session-Resource-To-Setup-List,

 PDU-Session-Resource-Setup-List,

 PDU-Session-Resource-Failed-List,

 PDU-Session-Resource-To-Modify-List,

 PDU-Session-Resource-Modified-List,

 PDU-Session-Resource-Failed-To-Modify-List,

 PDU-Session-Resource-To-Remove-List,

 PDU-Session-Resource-Required-To-Modify-List,

 PDU-Session-Resource-Confirm-Modified-List,

 PDU-Session-Resource-To-Setup-Mod-List,

 PDU-Session-Resource-Setup-Mod-List,

 PDU-Session-Resource-Failed-Mod-List,

 PDU-Session-To-Notify-List,

 DRB-Status-Item,

 DRB-Activity-Item,

 Data-Usage-Report-List,

 TimeToWait,

 ActivityNotificationLevel,

 ActivityInformation,

 New-UL-TNL-Information-Required,

 GNB-CU-CP-TNLA-Setup-Item,

 GNB-CU-CP-TNLA-Failed-To-Setup-Item,

 GNB-CU-CP-TNLA-To-Add-Item,

 GNB-CU-CP-TNLA-To-Remove-Item,

 GNB-CU-CP-TNLA-To-Update-Item,

 GNB-CU-UP-TNLA-To-Remove-Item,

 TransactionID,

 Inactivity-Timer,

 DRBs-Subject-To-Counter-Check-List-EUTRAN,

 DRBs-Subject-To-Counter-Check-List-NG-RAN,

 PPI,

 GNB-CU-UP-Capacity,

 GNB-CU-UP-OverloadInformation,

 DataDiscardRequired,

 PDU-Session-Resource-Data-Usage-List,

 RANUEID,

 GNB-DU-ID,

 TraceID,

 TraceActivation,

 SubscriberProfileIDforRFP,

 AdditionalRRMPriorityIndex,

 RetainabilityMeasurementsInfo,

 Transport-Layer-Address-Info,

 DLUPTNLAddressToUpdateItem,

 ULUPTNLAddressToUpdateItem

FROM E1AP-IEs

 PrivateIE-Container{},

 ProtocolExtensionContainer{},

 ProtocolIE-Container{},

 ProtocolIE-ContainerList{},

 ProtocolIE-SingleContainer{},

 E1AP-PRIVATE-IES,

 E1AP-PROTOCOL-EXTENSION,

 E1AP-PROTOCOL-IES

FROM E1AP-Containers

 id-Cause,

 id-CriticalityDiagnostics,

 id-gNB-CU-CP-UE-E1AP-ID,

 id-gNB-CU-UP-UE-E1AP-ID,

 id-ResetType,

 id-UE-associatedLogicalE1-ConnectionItem,

 id-UE-associatedLogicalE1-ConnectionListResAck,

 id-gNB-CU-UP-ID,

 id-gNB-CU-UP-Name,

 id-gNB-CU-CP-Name,

 id-CNSupport,

 id-SupportedPLMNs,

 id-SecurityInformation,

 id-UEDLAggregateMaximumBitRate,

 id-BearerContextStatusChange,

 id-System-BearerContextSetupRequest,

 id-System-BearerContextSetupResponse,

 id-System-BearerContextModificationRequest,

 id-System-BearerContextModificationResponse,

 id-System-BearerContextModificationConfirm,

 id-System-BearerContextModificationRequired,

 id-DRB-Status-List,

 id-Data-Usage-Report-List,

 id-TimeToWait,

 id-ActivityNotificationLevel,

 id-ActivityInformation,

 id-New-UL-TNL-Information-Required,

 id-GNB-CU-CP-TNLA-Setup-List,

 id-GNB-CU-CP-TNLA-Failed-To-Setup-List,

 id-GNB-CU-CP-TNLA-To-Add-List,

 id-GNB-CU-CP-TNLA-To-Remove-List,

 id-GNB-CU-CP-TNLA-To-Update-List,

 id-GNB-CU-UP-TNLA-To-Remove-List,

 id-DRB-To-Setup-List-EUTRAN,

 id-DRB-To-Modify-List-EUTRAN,

 id-DRB-To-Remove-List-EUTRAN,

 id-DRB-Required-To-Modify-List-EUTRAN,

 id-DRB-Required-To-Remove-List-EUTRAN,

 id-DRB-Setup-List-EUTRAN,

 id-DRB-Failed-List-EUTRAN,

 id-DRB-Modified-List-EUTRAN,

 id-DRB-Failed-To-Modify-List-EUTRAN,

 id-DRB-Confirm-Modified-List-EUTRAN,

 id-DRB-To-Setup-Mod-List-EUTRAN,

 id-DRB-Setup-Mod-List-EUTRAN,

 id-DRB-Failed-Mod-List-EUTRAN,

 id-PDU-Session-Resource-To-Setup-List,

 id-PDU-Session-Resource-To-Modify-List,

 id-PDU-Session-Resource-To-Remove-List,

 id-PDU-Session-Resource-Required-To-Modify-List,

 id-PDU-Session-Resource-Setup-List,

 id-PDU-Session-Resource-Failed-List,

 id-PDU-Session-Resource-Modified-List,

 id-PDU-Session-Resource-Failed-To-Modify-List,

 id-PDU-Session-Resource-Confirm-Modified-List,

 id-PDU-Session-Resource-Setup-Mod-List,

 id-PDU-Session-Resource-Failed-Mod-List,

 id-PDU-Session-Resource-To-Setup-Mod-List,

 id-PDU-Session-To-Notify-List,

 id-TransactionID,

 id-Serving-PLMN,

 id-UE-Inactivity-Timer,

 id-System-GNB-CU-UP-CounterCheckRequest,

 id-DRBs-Subject-To-Counter-Check-List-EUTRAN,

 id-DRBs-Subject-To-Counter-Check-List-NG-RAN,

 id-PPI,

 id-gNB-CU-UP-Capacity,

 id-GNB-CU-UP-OverloadInformation,

 id-UEDLMaximumIntegrityProtectedDataRate,

 id-DataDiscardRequired,

 id-PDU-Session-Resource-Data-Usage-List,

 id-RANUEID,

 id-GNB-DU-ID,

 id-TraceID,

 id-TraceActivation,

 id-SubscriberProfileIDforRFP,

 id-AdditionalRRMPriorityIndex,

 id-RetainabilityMeasurementsInfo,

 id-Transport-Layer-Address-Info,

 id-DLUPTNLAddressToUpdateList,

 id-ULUPTNLAddressToUpdateList,

 maxnoofErrors,

 maxnoofSPLMNs,

 maxnoofDRBs,

 maxnoofTNLAssociations,

 maxnoofIndividualE1ConnectionsToReset,

 maxnoofTNLAddresses

FROM E1AP-Constants;

>>>>>>>>unchanged parts are skipped<<<<<<<<

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

--

-- PRIVATE MESSAGE

--

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

PrivateMessage ::= SEQUENCE {

 privateIEs PrivateIE-Container {{PrivateMessage-IEs}},

 ...

}

PrivateMessage-IEs E1AP-PRIVATE-IES ::= {

 ...

}

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

--

-- IAB UP TNL ADDRESS UPDATE

--

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

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

--

-- IAB UP TNL Address Update

--

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

IAB-UPTNLAddressUpdate ::= SEQUENCE {

 protocolIEs ProtocolIE-Container { { IAB-UPTNLAddressUpdateIEs} },

 ...

}

IAB-UPTNLAddressUpdateIEs E1AP-PROTOCOL-IES ::= {

 { ID id-TransactionID CRITICALITY reject TYPE TransactionID PRESENCE mandatory }|

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

 ...

}

DLUPTNLAddressToUpdateList ::= SEQUENCE (SIZE(1.. maxnoofTNLAddresses)) OF DLUPTNLAddressToUpdateItem

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

--

-- IAB UP TNL Address Update Acknowledge

--

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

IAB-UPTNLAddressUpdateAcknowledge ::= SEQUENCE {

 protocolIEs ProtocolIE-Container { { IAB-UPTNLAddressUpdateAcknowledgeIEs} },

 ...

}

IAB-UPTNLAddressUpdateAcknowledgeIEs E1AP-PROTOCOL-IES ::= {

 { ID id-TransactionID CRITICALITY reject TYPE TransactionID PRESENCE mandatory }|

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

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

 ...

}

ULUPTNLAddressToUpdateList ::= SEQUENCE (SIZE(1.. maxnoofTNLAddresses)) OF ULUPTNLAddressToUpdateItem

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

--

-- IAB UP TNL Address Update Failure

--

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

IAB-UPTNLAddressUpdateFailure ::= SEQUENCE {

 protocolIEs ProtocolIE-Container { {IAB-UPTNLAddressUpdateFailureIEs} },

 ...

}

IAB-UPTNLAddressUpdateFailureIEs E1AP-PROTOCOL-IES ::= {

 { ID id-TransactionID CRITICALITY reject TYPE TransactionID PRESENCE mandatory }|

 { ID id-Cause CRITICALITY ignore TYPE Cause PRESENCE mandatory }|

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

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

 ...

}

END

-- ASN1STOP

### 9.4.5 Information Element Definitions

-- ASN1START

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

--

-- Information Element Definitions

 --

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

E1AP-IEs {

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

ngran-access (22) modules (3) e1ap (5) version1 (1) e1ap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

 id-CommonNetworkInstance,

 id-SNSSAI,

 id-OldQoSFlowMap-ULendmarkerexpected,

 id-DRB-QoS,

 id-endpoint-IP-Address-and-Port,

 id-NetworkInstance,

 id-QoSFlowMappingIndication,

 id-TNLAssociationTransportLayerAddressgNBCUUP,

 id-Cause,

 id-QoSMonitoringRequest,

 id-QoS-Mapping-Information,

 maxnoofErrors,

 maxnoofSliceItems,

 maxnoofEUTRANQOSParameters,

 maxnoofNGRANQOSParameters,

 maxnoofDRBs,

 maxnoofPDUSessionResource,

 maxnoofQoSFlows,

 maxnoofUPParameters,

 maxnoofCellGroups,

 maxnooftimeperiods,

 maxnoofNRCGI,

 maxnoofTLAs,

 maxnoofGTPTLAs

FROM E1AP-Constants

 Criticality,

 ProcedureCode,

 ProtocolIE-ID,

 TriggeringMessage

FROM E1AP-CommonDataTypes

 ProtocolExtensionContainer{},

 ProtocolIE-SingleContainer{},

 E1AP-PROTOCOL-EXTENSION,

 E1AP-PROTOCOL-IES

FROM E1AP-Containers;

>>>>>>>>unchanged parts are skipped<<<<<<<<

-- C

Cause ::= CHOICE {

 radioNetwork CauseRadioNetwork,

 transport CauseTransport,

 protocol CauseProtocol,

 misc CauseMisc,

 choice-extension ProtocolIE-SingleContainer {{Cause-ExtIEs}}

}

Cause-ExtIEs E1AP-PROTOCOL-IES ::= {

 ...

}

CauseMisc ::= ENUMERATED {

 control-processing-overload,

 not-enough-user-plane-processing-resources,

 hardware-failure,

 om-intervention,

 unspecified,

 ...

}

CauseProtocol ::= ENUMERATED {

 transfer-syntax-error,

 abstract-syntax-error-reject,

 abstract-syntax-error-ignore-and-notify,

 message-not-compatible-with-receiver-state,

 semantic-error,

 abstract-syntax-error-falsely-constructed-message,

 unspecified,

 ...

}

CauseRadioNetwork ::= ENUMERATED {

 unspecified,

 unknown-or-already-allocated-gnb-cu-cp-ue-e1ap-id,

 unknown-or-already-allocated-gnb-cu-up-ue-e1ap-id,

 unknown-or-inconsistent-pair-of-ue-e1ap-id,

 interaction-with-other-procedure,

 pPDCP-Count-wrap-around,

 not-supported-QCI-value,

 not-supported-5QI-value,

 encryption-algorithms-not-supported,

 integrity-protection-algorithms-not-supported,

 uP-integrity-protection-not-possible,

 uP-confidentiality-protection-not-possible,

 multiple-PDU-Session-ID-Instances,

 unknown-PDU-Session-ID,

 multiple-QoS-Flow-ID-Instances,

 unknown-QoS-Flow-ID,

 multiple-DRB-ID-Instances,

 unknown-DRB-ID,

 invalid-QoS-combination,

 procedure-cancelled,

 normal-release,

 no-radio-resources-available,

 action-desirable-for-radio-reasons,

 resources-not-available-for-the-slice,

 pDCP-configuration-not-supported,

 ...,

 ue-dl-max-IP-data-rate-reason,

 uP-integrity-protection-failure,

 release-due-to-pre-emption

}

CauseTransport ::= ENUMERATED {

 unspecified,

 transport-resource-unavailable,

 ...,

 unknown-TNL-address-for-IAB

}

>>>>>>>>unchanged parts are skipped<<<<<<<<

-- D

Data-Forwarding-Information-Request ::= SEQUENCE {

 data-Forwarding-Request Data-Forwarding-Request,

 qoS-Flows-Forwarded-On-Fwd-Tunnels QoS-Flow-Mapping-List OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { Data-Forwarding-Information-Request-ExtIEs } } OPTIONAL,

 ...

}

Data-Forwarding-Information-Request-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

Data-Forwarding-Information ::= SEQUENCE {

 uL-Data-Forwarding UP-TNL-Information OPTIONAL,

 dL-Data-Forwarding UP-TNL-Information OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { Data-Forwarding-Information-ExtIEs } } OPTIONAL,

 ...

}

Data-Forwarding-Information-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

Data-Forwarding-Request ::= ENUMERATED {

 uL,

 dL,

 both,

 ...

}

Data-Usage-per-PDU-Session-Report ::= SEQUENCE {

 secondaryRATType ENUMERATED {nR, e-UTRA, ...},

 pDU-session-Timed-Report-List SEQUENCE (SIZE(1..maxnooftimeperiods)) OF MRDC-Data-Usage-Report-Item,

 iE-Extensions ProtocolExtensionContainer { { Data-Usage-per-PDU-Session-Report-ExtIEs} } OPTIONAL,

...

}

Data-Usage-per-PDU-Session-Report-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

Data-Usage-per-QoS-Flow-List ::= SEQUENCE (SIZE(1..maxnoofQoSFlows)) OF Data-Usage-per-QoS-Flow-Item

Data-Usage-per-QoS-Flow-Item ::= SEQUENCE {

 qoS-Flow-Identifier QoS-Flow-Identifier,

 secondaryRATType ENUMERATED {nR, e-UTRA, ...},

 qoS-Flow-Timed-Report-List SEQUENCE (SIZE(1..maxnooftimeperiods)) OF MRDC-Data-Usage-Report-Item,

 iE-Extensions ProtocolExtensionContainer { { Data-Usage-per-QoS-Flow-Item-ExtIEs} } OPTIONAL,

...

}

Data-Usage-per-QoS-Flow-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

Data-Usage-Report-List ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF Data-Usage-Report-Item

Data-Usage-Report-Item ::= SEQUENCE {

 dRB-ID DRB-ID,

 rAT-Type RAT-Type,

 dRB-Usage-Report-List DRB-Usage-Report-List,

 iE-Extensions ProtocolExtensionContainer { { Data-Usage-Report-ItemExtIEs } } OPTIONAL,

 ...

}

Data-Usage-Report-ItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

DefaultDRB ::= ENUMERATED {

 true,

 false,

 ...

}

DiscardTimer ::= ENUMERATED {ms10, ms20, ms30, ms40, ms50, ms60, ms75, ms100, ms150, ms200, ms250, ms300, ms500, ms750, ms1500, infinity}

DLUPTNLAddressToUpdateItem ::= SEQUENCE {

 oldTNLAdress TransportLayerAddress,

 newTNLAdress TransportLayerAddress,

 iE-Extensions ProtocolExtensionContainer { { DLUPTNLAddressToUpdateItemExtIEs } } OPTIONAL,

 ...

}

DLUPTNLAddressToUpdateItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

DL-TX-Stop ::= ENUMERATED {

 stop,

 resume,

 ...

}

>>>>>>>>unchanged parts are skipped<<<<<<<<

-- Q

QCI ::= INTEGER (0..255)

QoS-Characteristics ::= CHOICE {

 non-Dynamic-5QI Non-Dynamic5QIDescriptor,

 dynamic-5QI Dynamic5QIDescriptor,

 choice-extension ProtocolIE-SingleContainer {{QoS-Characteristics-ExtIEs}}

}

QoS-Characteristics-ExtIEs E1AP-PROTOCOL-IES ::= {

 ...

}

QoS-Flow-Identifier ::= INTEGER (0..63)

QoS-Flow-List ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF QoS-Flow-Item

QoS-Flow-Item ::= SEQUENCE {

 qoS-Flow-Identifier QoS-Flow-Identifier,

 iE-Extensions ProtocolExtensionContainer { { QoS-Flow-Item-ExtIEs } } OPTIONAL,

 ...

}

QoS-Flow-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 {ID id-QoSFlowMappingIndication CRITICALITY ignore EXTENSION QoS-Flow-Mapping-Indication PRESENCE optional},

 ...

}

QoS-Flow-Failed-List ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF QoS-Flow-Failed-Item

QoS-Flow-Failed-Item ::= SEQUENCE {

 qoS-Flow-Identifier QoS-Flow-Identifier,

 cause Cause,

 iE-Extensions ProtocolExtensionContainer { { QoS-Flow-Failed-Item-ExtIEs } } OPTIONAL,

 ...

}

QoS-Flow-Failed-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

QoS-Flow-Mapping-List ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF QoS-Flow-Mapping-Item

QoS-Flow-Mapping-Item ::= SEQUENCE {

 qoS-Flow-Identifier QoS-Flow-Identifier,

 qoSFlowMappingIndication QoS-Flow-Mapping-Indication OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { QoS-Flow-Mapping-Item-ExtIEs } } OPTIONAL,

 ...

}

QoS-Flow-Mapping-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

QoS-Flow-Mapping-Indication ::= ENUMERATED {ul, dl, ...}

QoS-Parameters-Support-List ::= SEQUENCE {

 eUTRAN-QoS-Support-List EUTRAN-QoS-Support-List OPTIONAL,

 nG-RAN-QoS-Support-List NG-RAN-QoS-Support-List OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { QoS-Parameters-Support-List-ItemExtIEs} } OPTIONAL,

 ...

}

QoS-Parameters-Support-List-ItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

QoSPriorityLevel ::= INTEGER (0..127, ...)

QoS-Flow-QoS-Parameter-List ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF QoS-Flow-QoS-Parameter-Item

QoS-Flow-QoS-Parameter-Item ::= SEQUENCE {

 qoS-Flow-Identifier QoS-Flow-Identifier,

 qoSFlowLevelQoSParameters QoSFlowLevelQoSParameters,

 qoSFlowMappingIndication QoS-Flow-Mapping-Indication OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { QoS-Flow-QoS-Parameter-Item-ExtIEs } } OPTIONAL,

 ...

}

QoS-Flow-QoS-Parameter-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

QoSFlowLevelQoSParameters ::= SEQUENCE {

 qoS-Characteristics QoS-Characteristics,

 nGRANallocationRetentionPriority NGRANAllocationAndRetentionPriority,

 gBR-QoS-Flow-Information GBR-QoSFlowInformation OPTIONAL,

 reflective-QoS-Attribute ENUMERATED {subject-to, ...} OPTIONAL,

 additional-QoS-Information ENUMERATED {more-likely, ...} OPTIONAL,

 paging-Policy-Indicator INTEGER (1..8, ...) OPTIONAL,

 reflective-QoS-Indicator ENUMERATED {enabled, ...} OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { QoSFlowLevelQoSParameters-ExtIEs } } OPTIONAL

}

QoSFlowLevelQoSParameters-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 {ID id-QoSMonitoringRequest CRITICALITY ignore EXTENSION QosMonitoringRequest PRESENCE optional},

 ...

}

QosMonitoringRequest ::= ENUMERATED {ul, dl, both}

QoS-Flow-Removed-Item ::= SEQUENCE {

 qoS-Flow-Identifier QoS-Flow-Identifier,

 qoS-Flow-Released-In-Session ENUMERATED {released-in-session, not-released-in-session, ...} OPTIONAL,

 qoS-Flow-Accumulated-Session-Time OCTET STRING (SIZE(5)) OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { QoS-Flow-Removed-Item-ExtIEs } } OPTIONAL,

 ...

}

QoS-Flow-Removed-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

QoS-Mapping-Information ::= SEQUENCE {

dscp BIT STRING (SIZE(6)) OPTIONAL,

flow-label BIT STRING (SIZE(20)) OPTIONAL,

...

}

>>>>>>>>unchanged parts are skipped<<<<<<<<

-- U

UE-Activity ::= ENUMERATED {

 active,

 not-active,

 ...

}

UE-associatedLogicalE1-ConnectionItem ::= SEQUENCE {

 gNB-CU-CP-UE-E1AP-ID GNB-CU-CP-UE-E1AP-ID OPTIONAL,

 gNB-CU-UP-UE-E1AP-ID GNB-CU-UP-UE-E1AP-ID OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { UE-associatedLogicalE1-ConnectionItemExtIEs} } OPTIONAL,

 ...

}

UE-associatedLogicalE1-ConnectionItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

UL-Configuration ::= ENUMERATED {

 no-data,

 shared,

 only,

 ...

}

ULUPTNLAddressToUpdateItem ::= SEQUENCE {

 oldTNLAdress TransportLayerAddress,

 newTNLAdress TransportLayerAddress,

 iE-Extensions ProtocolExtensionContainer { { ULUPTNLAddressToUpdateItemExtIEs } } OPTIONAL,

 ...

}

ULUPTNLAddressToUpdateItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

ULDataSplitThreshold ::= ENUMERATED {b0, b100, b200, b400, b800, b1600, b3200, b6400, b12800, b25600, b51200, b102400, b204800, b409600, b819200, b1228800, b1638400, b2457600, b3276800, b4096000, b4915200, b5734400, b6553600, infinity, ...}

UP-Parameters ::= SEQUENCE (SIZE(1.. maxnoofUPParameters)) OF UP-Parameters-Item

UP-Parameters-Item ::= SEQUENCE {

 uP-TNL-Information UP-TNL-Information,

 cell-Group-ID Cell-Group-ID,

 iE-Extensions ProtocolExtensionContainer { { UP-Parameters-Item-ExtIEs } } OPTIONAL,

 ...

}

UP-Parameters-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 {ID id-QoS-Mapping-Information CRITICALITY reject EXTENSION QoS-Mapping-Information PRESENCE optional},

 ...

}

UPSecuritykey ::= SEQUENCE {

 encryptionKey EncryptionKey,

 integrityProtectionKey IntegrityProtectionKey OPTIONAL,

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

 ...

}

UPSecuritykey-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

UP-TNL-Information ::= CHOICE {

 gTPTunnel GTPTunnel,

 choice-extension ProtocolIE-SingleContainer {{UP-TNL-Information-ExtIEs}}

}

UP-TNL-Information-ExtIEs E1AP-PROTOCOL-IES ::= {

 ...

}

UplinkOnlyROHC ::= SEQUENCE {

 maxCID INTEGER (0..16383, ...),

 rOHC-Profiles INTEGER (0..511, ...),

 continueROHC ENUMERATED {true, ...} OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { UplinkOnlyROHC-ExtIEs } } OPTIONAL

}

UplinkOnlyROHC-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

 ...

}

>>>>>>>>unchanged parts are skipped<<<<<<<<

### 9.4.7 Constant Definitions

-- ASN1START

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

--

-- Constant definitions

--

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

E1AP-Constants {

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

ngran-access (22) modules (3) e1ap (5) version1 (1) e1ap-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

 ProcedureCode,

 ProtocolIE-ID

FROM E1AP-CommonDataTypes;

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

--

-- Elementary Procedures

--

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

id-reset ProcedureCode ::= 0

id-errorIndication ProcedureCode ::= 1

id-privateMessage ProcedureCode ::= 2

id-gNB-CU-UP-E1Setup ProcedureCode ::= 3

id-gNB-CU-CP-E1Setup ProcedureCode ::= 4

id-gNB-CU-UP-ConfigurationUpdate ProcedureCode ::= 5

id-gNB-CU-CP-ConfigurationUpdate ProcedureCode ::= 6

id-e1Release ProcedureCode ::= 7

id-bearerContextSetup ProcedureCode ::= 8

id-bearerContextModification ProcedureCode ::= 9

id-bearerContextModificationRequired ProcedureCode ::= 10

id-bearerContextRelease ProcedureCode ::= 11

id-bearerContextReleaseRequest ProcedureCode ::= 12

id-bearerContextInactivityNotification ProcedureCode ::= 13

id-dLDataNotification ProcedureCode ::= 14

id-dataUsageReport ProcedureCode ::= 15

id-gNB-CU-UP-CounterCheck ProcedureCode ::= 16

id-gNB-CU-UP-StatusIndication ProcedureCode ::= 17

id-uLDataNotification ProcedureCode ::= 18

id-mRDC-DataUsageReport ProcedureCode ::= 19

id-TraceStart ProcedureCode ::= 20

id-DeactivateTrace ProcedureCode ::= 21

id-iAB-UPTNLAddressUpdate ProcedureCode ::= xx

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

--

-- Lists

--

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

maxnoofErrors INTEGER ::= 256

maxnoofSPLMNs INTEGER ::= 12

maxnoofSliceItems INTEGER ::= 1024

maxnoofIndividualE1ConnectionsToReset INTEGER ::= 65536

maxnoofEUTRANQOSParameters INTEGER ::= 256

maxnoofNGRANQOSParameters INTEGER ::= 256

maxnoofDRBs INTEGER ::= 32

maxnoofNRCGI INTEGER ::= 512

maxnoofPDUSessionResource INTEGER ::= 256

maxnoofQoSFlows INTEGER ::= 64

maxnoofUPParameters INTEGER ::= 8

maxnoofCellGroups INTEGER ::= 4

maxnooftimeperiods INTEGER ::= 2

maxnoofTNLAssociations INTEGER ::= 32

maxnoofTLAs INTEGER ::= 16

maxnoofGTPTLAs INTEGER ::= 16

maxnoofTNLAddresses INTEGER ::= 8

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

--

-- IEs

--

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

id-Cause ProtocolIE-ID ::= 0

id-CriticalityDiagnostics ProtocolIE-ID ::= 1

id-gNB-CU-CP-UE-E1AP-ID ProtocolIE-ID ::= 2

id-gNB-CU-UP-UE-E1AP-ID ProtocolIE-ID ::= 3

id-ResetType ProtocolIE-ID ::= 4

id-UE-associatedLogicalE1-ConnectionItem ProtocolIE-ID ::= 5

id-UE-associatedLogicalE1-ConnectionListResAck ProtocolIE-ID ::= 6

id-gNB-CU-UP-ID ProtocolIE-ID ::= 7

id-gNB-CU-UP-Name ProtocolIE-ID ::= 8

id-gNB-CU-CP-Name ProtocolIE-ID ::= 9

id-CNSupport ProtocolIE-ID ::= 10

id-SupportedPLMNs ProtocolIE-ID ::= 11

id-TimeToWait ProtocolIE-ID ::= 12

id-SecurityInformation ProtocolIE-ID ::= 13

id-UEDLAggregateMaximumBitRate ProtocolIE-ID ::= 14

id-System-BearerContextSetupRequest ProtocolIE-ID ::= 15

id-System-BearerContextSetupResponse ProtocolIE-ID ::= 16

id-BearerContextStatusChange ProtocolIE-ID ::= 17

id-System-BearerContextModificationRequest ProtocolIE-ID ::= 18

id-System-BearerContextModificationResponse ProtocolIE-ID ::= 19

id-System-BearerContextModificationConfirm ProtocolIE-ID ::= 20

id-System-BearerContextModificationRequired ProtocolIE-ID ::= 21

id-DRB-Status-List ProtocolIE-ID ::= 22

id-ActivityNotificationLevel ProtocolIE-ID ::= 23

id-ActivityInformation ProtocolIE-ID ::= 24

id-Data-Usage-Report-List ProtocolIE-ID ::= 25

id-New-UL-TNL-Information-Required ProtocolIE-ID ::= 26

id-GNB-CU-CP-TNLA-To-Add-List ProtocolIE-ID ::= 27

id-GNB-CU-CP-TNLA-To-Remove-List ProtocolIE-ID ::= 28

id-GNB-CU-CP-TNLA-To-Update-List ProtocolIE-ID ::= 29

id-GNB-CU-CP-TNLA-Setup-List ProtocolIE-ID ::= 30

id-GNB-CU-CP-TNLA-Failed-To-Setup-List ProtocolIE-ID ::= 31

id-DRB-To-Setup-List-EUTRAN ProtocolIE-ID ::= 32

id-DRB-To-Modify-List-EUTRAN ProtocolIE-ID ::= 33

id-DRB-To-Remove-List-EUTRAN ProtocolIE-ID ::= 34

id-DRB-Required-To-Modify-List-EUTRAN ProtocolIE-ID ::= 35

id-DRB-Required-To-Remove-List-EUTRAN ProtocolIE-ID ::= 36

id-DRB-Setup-List-EUTRAN ProtocolIE-ID ::= 37

id-DRB-Failed-List-EUTRAN ProtocolIE-ID ::= 38

id-DRB-Modified-List-EUTRAN ProtocolIE-ID ::= 39

id-DRB-Failed-To-Modify-List-EUTRAN ProtocolIE-ID ::= 40

id-DRB-Confirm-Modified-List-EUTRAN ProtocolIE-ID ::= 41

id-PDU-Session-Resource-To-Setup-List ProtocolIE-ID ::= 42

id-PDU-Session-Resource-To-Modify-List ProtocolIE-ID ::= 43

id-PDU-Session-Resource-To-Remove-List ProtocolIE-ID ::= 44

id-PDU-Session-Resource-Required-To-Modify-List ProtocolIE-ID ::= 45

id-PDU-Session-Resource-Setup-List ProtocolIE-ID ::= 46

id-PDU-Session-Resource-Failed-List ProtocolIE-ID ::= 47

id-PDU-Session-Resource-Modified-List ProtocolIE-ID ::= 48

id-PDU-Session-Resource-Failed-To-Modify-List ProtocolIE-ID ::= 49

id-PDU-Session-Resource-Confirm-Modified-List ProtocolIE-ID ::= 50

id-DRB-To-Setup-Mod-List-EUTRAN ProtocolIE-ID ::= 51

id-DRB-Setup-Mod-List-EUTRAN ProtocolIE-ID ::= 52

id-DRB-Failed-Mod-List-EUTRAN ProtocolIE-ID ::= 53

id-PDU-Session-Resource-Setup-Mod-List ProtocolIE-ID ::= 54

id-PDU-Session-Resource-Failed-Mod-List ProtocolIE-ID ::= 55

id-PDU-Session-Resource-To-Setup-Mod-List ProtocolIE-ID ::= 56

id-TransactionID ProtocolIE-ID ::= 57

id-Serving-PLMN ProtocolIE-ID ::= 58

id-UE-Inactivity-Timer ProtocolIE-ID ::= 59

id-System-GNB-CU-UP-CounterCheckRequest ProtocolIE-ID ::= 60

id-DRBs-Subject-To-Counter-Check-List-EUTRAN ProtocolIE-ID ::= 61

id-DRBs-Subject-To-Counter-Check-List-NG-RAN ProtocolIE-ID ::= 62

id-PPI ProtocolIE-ID ::= 63

id-gNB-CU-UP-Capacity ProtocolIE-ID ::= 64

id-GNB-CU-UP-OverloadInformation ProtocolIE-ID ::= 65

id-UEDLMaximumIntegrityProtectedDataRate ProtocolIE-ID ::= 66

id-PDU-Session-To-Notify-List ProtocolIE-ID ::= 67

id-PDU-Session-Resource-Data-Usage-List ProtocolIE-ID ::= 68

id-SNSSAI ProtocolIE-ID ::= 69

id-DataDiscardRequired ProtocolIE-ID ::= 70

id-OldQoSFlowMap-ULendmarkerexpected ProtocolIE-ID ::= 71

id-DRB-QoS ProtocolIE-ID ::= 72

id-GNB-CU-UP-TNLA-To-Remove-List ProtocolIE-ID ::= 73

id-endpoint-IP-Address-and-Port ProtocolIE-ID ::= 74

id-TNLAssociationTransportLayerAddressgNBCUUP ProtocolIE-ID ::= 75

id-RANUEID ProtocolIE-ID ::= 76

id-GNB-DU-ID ProtocolIE-ID ::= 77

id-CommonNetworkInstance ProtocolIE-ID ::= 78

id-NetworkInstance ProtocolIE-ID ::= 79

id-QoSFlowMappingIndication ProtocolIE-ID ::= 80

id-TraceActivation ProtocolIE-ID ::= 81

id-TraceID ProtocolIE-ID ::= 82

id-SubscriberProfileIDforRFP ProtocolIE-ID ::= 83

id-AdditionalRRMPriorityIndex ProtocolIE-ID ::= 84

id-RetainabilityMeasurementsInfo ProtocolIE-ID ::= 85

id-Transport-Layer-Address-Info ProtocolIE-ID ::= 86

id-QoSMonitoringRequest ProtocolIE-ID ::= 87

id-QoS-Mapping-Information ProtocolIE-ID ::= xx

id-DLUPTNLAddressToUpdateList ProtocolIE-ID ::= xx

id-ULUPTNLAddressToUpdateList ProtocolIE-ID ::= xx

END

-- ASN1STOP