# 9 Elements for E1AP communication

## 9.2 Message Functional Definition and Content

### 9.2.1 Interface Management messages

#### 9.2.1.1 RESET

This message is sent by both the gNB-CU-CP and the gNB-CU-UP and is used to request that the E1 interface, or parts of the E1 interface, to be reset.

Direction: gNB-CU-CP → gNB-CU-UP and 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 |
| CHOICE *Reset Type* | M |  |  |  | YES | reject |
| >*E1 interface* |  |  |  |  |  |  |
| >>Reset All | M |  | ENUMERATED (Reset all,…) |  | - |  |
| >*Part of E1 interface* |  |  |  |  |  |  |
| **>>UE-associated logical E1-connection list** |  | *1* |  |  | - |  |
| **>>>UE-associated logical E1-connection Item** |  | *1 .. <maxnoofIndividualE1ConnectionsToReset>* |  |  | EACH | reject |
| >>>>gNB-CU-CP UE E1AP ID | O |  | 9.3.1.4 |  | - |  |
| >>>>gNB-CU-UP UE E1AP ID | O |  | 9.3.1.5 |  | - |  |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofIndividualE1ConnectionsToReset | Maximum no. of UE-associated logical E1-connections allowed to reset in one message. Value is 65536. |

#### 9.2.1.2 RESET ACKNOWLEDGE

This message is sent by both the gNB-CU-CP and the gNB-CU-UP as a response to a RESET message.

Direction: gNB-CU-UP → gNB-CU-CP and 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 |
| **UE-associated logical E1-connection list** |  | *0..1* |  |  | YES | ignore |
| **>UE-associated logical E1-connection Item** |  | *1 .. <maxnoofIndividualE1ConnectionsToReset>* |  |  | EACH | ignore |
| >>gNB-CU-CP UE E1AP ID | O |  | 9.3.1.4 |  | - |  |
| >>gNB-CU-UP UE E1AP ID | O |  | 9.3.1.5 |  | - |  |
| Criticality Diagnostics | O |  | 9.3.1.3 |  | YES | ignore |

|  |  |
| --- | --- |
| **Range bound** | **Explanation** |
| maxnoofIndividualE1ConnectionsToReset | Maximum no. of UE-associated logical E1-connections allowed to reset in one message. Value is 65536. |

#### 9.2.1.3 ERROR INDICATION

This message is sent by both the gNB-CU-CP and the gNB-CU-UP and is used to indicate that some error has been detected in the node.

Direction: gNB-CU-CP → gNB-CU-UP and 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 | ignore |
| Transaction ID | M |  | 9.3.1.53 | This IE is ignored if received in UE associated signalling message. | YES | reject |
| gNB-CU-CP UE E1AP ID | O |  | 9.3.1.4 |  | YES | ignore |
| gNB-CU-UP UE E1AP ID | O |  | 9.3.1.5 |  | YES | ignore |
| Cause | O |  | 9.3.1.2 |  | YES | ignore |
| Criticality Diagnostics | O |  | 9.3.1.3 |  | YES | ignore |

#### 9.2.1.4 GNB-CU-UP E1 SETUP REQUEST

This message is sent by the gNB-CU-UP to transfer information for a TNL association.

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 |
| gNB-CU-UP ID | M |  | 9.3.1.15 |  | YES | reject |
| gNB-CU-UP Name | O |  | PrintableString(SIZE(1..150,…)) | Human readable name of the gNB-CU-UP. | YES | ignore |
| CN Support | M |  | ENUMERATED (EPC. 5GC, both, …) |  | YES | reject |
| **Supported PLMNs** |  | *1..<maxnoofSPLMNs>* |  | Supported PLMNs | YES | reject |
| >PLMN Identity | M |  | 9.3.1.7 |  | - | - |
| >Slice Support List | O |  | 9.3.1.8 | Supported S-NSSAIs per PLMN. | - | - |
| >Extended Slice Support List | O |  | 9.3.1.94 | Additional Supported S-NSSAIs per PLMN. | YES | reject |
| >NR CGI Support List | O |  | 9.3.1.36 | Supported cells. | - | - |
| >QoS Parameters Support List | O |  | 9.3.1.37 | Supported QoS parameters per PLMN. | - | - |
| >NPN Support Information | O |  | 9.3.1.83 |  | YES | reject |
| >Extended NR CGI Support List | O |  | 9.3.1.97 | Additional supported cells per PLMN. | YES | ignore |
| gNB-CU-UP Capacity | O |  | 9.3.1.56 |  | YES | ignore |
| Transport Network Layer Address Info | O |  | 9.3.2.7 |  | YES | ignore |
| Extended gNB-CU-UP Name | O |  | 9.3.1.95 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofSPLMNs | Maximum no. of Supported PLMN Ids. Value is 12. |

#### 9.2.1.5 GNB-CU-UP E1 SETUP RESPONSE

This message is sent by the gNB-CU-CP to transfer information for a TNL association.

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 |
| gNB-CU-CP Name | O |  | PrintableString(SIZE(1..150,…)) | Human readable name of the gNB-CU-CP. | YES | ignore |
| Transport Network Layer Address Info | O |  | 9.3.2.7 |  | YES | ignore |
| Extended gNB-CU-CP Name | O |  | 9.3.1.96 |  | YES | ignore |

#### 9.2.1.6 GNB-CU-UP E1 SETUP FAILURE

This message is sent by the gNB-CU-CP to indicate E1 Setup failure.

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 |
| 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 |

#### 9.2.1.7 GNB-CU-CP E1 SETUP REQUEST

This message is sent by the gNB-CU-CP to transfer information for a TNL association.

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 |
| gNB-CU-CP Name | O |  | PrintableString(SIZE(1..150,…)) | Human readable name of the gNB-CU-CP. | YES | ignore |
| Transport Network Layer Address Info | O |  | 9.3.2.7 |  | YES | ignore |
| Extended gNB-CU-CP Name | O |  | 9.3.1.95 |  | YES | ignore |

#### 9.2.1.8 GNB-CU-CP E1 SETUP RESPONSE

This message is sent by the gNB-CU-UP to transfer information for a TNL association.

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 |
| gNB-CU-UP ID | M |  | 9.3.1.15 |  | YES | reject |
| gNB-CU-UP Name | O |  | PrintableString(SIZE(1..150,…)) | Human readable name of the gNB-CU-UP. | YES | ignore |
| CN Support | M |  | ENUMERATED (EPC. 5GC, both, …) |  | YES | reject |
| **Supported PLMNs** |  | *1..<maxnoofSPLMNs>* |  | Supported PLMNs | YES | reject |
| >PLMN Identity | M |  | 9.3.1.7 |  | - | - |
| >Slice Support List | O |  | 9.3.1.8 | Supported S-NSSAIs per PLMN. | - | - |
| >Extended Slice Support List | O |  | 9.3.1.94 | Additional Supported S-NSSAIs per PLMN. | YES | reject |
| >NR CGI Support List | O |  | 9.3.1.36 | Supported cells. | - | - |
| >QoS Parameters Support List | O |  | 9.3.1.37 | Supported QoS parameters per PLMN. | - | - |
| >NPN Support Information | O |  | 9.3.1.83 |  | YES | reject |
| >Extended NR CGI Support List | O |  | 9.3.1.97 | Additional supported cells per PLMN. | YES | ignore |
| gNB-CU-UP Capacity | O |  | 9.3.1.56 |  | YES | ignore |
| Transport Network Layer Address Info | O |  | 9.3.2.7 |  | YES | ignore |
| Extended gNB-CU-UP Name | O |  | 9.3.1.95 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofSPLMNs | Maximum no. of Supported PLMN Ids. Value is 12. |

#### 9.2.1.9 GNB-CU-CP E1 SETUP FAILURE

This message is sent by the gNB-CU-UP to indicate E1 Setup 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 |

#### 9.2.1.10 GNB-CU-UP CONFIGURATION UPDATE

This message is sent by the gNB-CU-UP to transfer updated information for a TNL association.

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 |
| gNB-CU-UP ID | O |  | 9.3.1.15 |  | YES | reject |
| gNB-CU-UP Name | O |  | PrintableString(SIZE(1..150,…)) | Human readable name of the gNB-CU-UP. | YES | ignore |
| **Supported PLMNs** |  | *0..<maxnoofSPLMNs>* |  | Supported PLMNs | YES | reject |
| >PLMN Identity | M |  | 9.3.1.7 |  | - | - |
| >Slice Support List | O |  | 9.3.1.8 | Supported S-NSSAIs per PLMN. | - | - |
| >Extended Slice Support List | O |  | 9.3.1.94 | Additional Supported S-NSSAIs per PLMN. | YES | reject |
| >NR CGI Support List | O |  | 9.3.1.36 | Supported cells. | - | - |
| >QoS Parameters Support List | O |  | 9.3.1.37 | Supported QoS parameters per PLMN. | - | - |
| >NPN Support Information | O |  | 9.3.1.83 |  | YES | reject |
| >Extended NR CGI Support List | O |  | 9.3.1.97 | Additional supported cells per PLMN. | YES | ignore |
| gNB-CU-UP Capacity | O |  | 9.3.1.56 |  | YES | ignore |
| gNB-CU-UP TNLA To Remove List |  | *0..1* |  |  | YES | reject |
| >gNB-CU-UP TNLA To Remove Item IEs |  | *1..<maxnoofTNLAssociations>* |  |  | - | - |
| >>TNLA Transport Layer Address | M |  | CP Transport Layer Information  9.3.2.2 | Transport Layer Address of the gNB-CU-UP. | - | - |
| >>TNLA Transport Layer Address gNB-CU-CP | O |  | CP Transport Layer Information  9.3.2.2 | Transport Layer Address of the gNB-CU-CP. | - | - |
| Transport Network Layer Address Info | O |  | 9.3.2.7 |  | YES | ignore |
| Extended gNB-CU-UP Name | O |  | 9.3.1.96 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofSPLMNs | Maximum no. of Supported PLMN Ids. Value is 12. |
| maxnoofTNLAssociations | Maximum numbers of TNL Associations between the gNB-CU-UP and the gNB-CU-CP. Value is 32. |

#### 9.2.1.11 GNB-CU-UP CONFIGURATION UPDATE ACKNOWLEDGE

This message is sent by a gNB-CU-CP to a gNB-CU-UP to acknowledge update of information for a TNL association.

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 |
| Criticality Diagnostics | O |  | 9.3.1.3 |  | YES | ignore |
| Transport Network Layer Address Info | O |  | 9.3.2.7 |  | YES | ignore |

#### 9.2.1.12 GNB-CU-UP CONFIGURATION UPDATE FAILURE

This message is sent by the gNB-CU-CP to indicate gNB-CU-UP Configuration Update failure.

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 |
| 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 |

#### 9.2.1.13 GNB-CU-CP CONFIGURATION UPDATE

This message is sent by the gNB-CU-CP to transfer updated information for a TNL association.

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 |
| gNB-CU-CP Name | O |  | PrintableString(SIZE(1..150,…)) | Human readable name of the gNB-CU-CP | YES | ignore |
| **gNB-CU-CP TNLA To Add List** |  | *0..1* |  |  | YES | ignore |
| **>gNB-CU-CP TNLA To Add Item IEs** |  | *1..<maxnoofTNLAssociations>* |  |  | - | - |
| >>TNLA Transport Layer Information | M |  | CP Transport Layer Information  9.3.2.2 | Transport Layer Address of the gNB-CU-CP. | - | - |
| >>TNLA Usage | M |  | ENUMERATED (ue, non-ue, both, …) | Indicates whether the TNLA is only used for UE-associated signalling, or non-UE-associated signalling, or both. For usage of this IE, refer to TS 38.462 [18]. | - | - |
| **gNB-CU-CP TNLA To Remove List** |  | *0..1* |  |  | YES | ignore |
| **>gNB-CU-CP TNLA To Remove Item IEs** |  | *1..<maxnoofTNLAssociations>* |  |  | - | - |
| >>TNLA Transport Layer Address | M |  | CP Transport Layer Information  9.3.2.2 | Transport Layer Address of the gNB-CU-CP. | - | - |
| >>TNLA Transport Layer Address gNB-CU-UP | O |  | CP Transport Layer Information  9.3.2.2 | Transport Layer Address of the gNB-CU-UP. | YES | reject |
| **gNB-CU-CP TNLA To Update List** |  | *0..1* |  |  | YES | ignore |
| **>gNB-CU-CP TNLA To Update Item IEs** |  | *1..<maxnoofTNLAssociations>* |  |  | - | - |
| >>TNLA Transport Layer Address | M |  | CP Transport Layer Address  9.3.2.2 | Transport Layer Address of the gNB-CU-CP. | - | - |
| >>TNLA Usage | O |  | ENUMERATED (ue, non-ue, both, …) | Indicates whether the TNLA is only used for UE-associated signalling, or non-UE-associated signalling, or both. For usage of this IE, refer to TS 38.462 [18]. | - | - |
| Transport Network Layer Address Info | O |  | 9.3.2.7 |  | YES | ignore |
| Extended gNB-CU-CP Name | O |  | 9.3.1.95 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofTNLAssociations | Maximum numbers of TNL Associations between the gNB-CU-CP and the gNB-CU-UP. Value is 32. |

#### 9.2.1.14 GNB-CU-CP CONFIGURATION UPDATE ACKNOWLEDGE

This message is sent by a gNB-CU-UP to a gNB-CU-CP to acknowledge update of information for a TNL association.

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 |
| **gNB-CU-CP TNLA Setup List** |  | *0..1* |  |  | YES | ignore |
| **>gNB-CU-CP TNLA Setup Item IEs** |  | *1..<maxnoofTNLAssociations>* |  |  | - | - |
| >>TNLA Transport Layer Address | M |  | CP Transport Layer Information  9.3.2.2 | Transport Layer Address of the gNB-CU-CP | - | - |
| **gNB-CU-CP TNLA Failed to Setup List** |  | *0..1* |  |  | YES | ignore |
| **>gNB-CU-CP TNLA Failed To Setup Item IEs** |  | *1..<maxnoofTNLAssociations>* |  |  | - | - |
| >>TNLA Transport Layer Address | M |  | CP Transport Layer Information  9.3.2.2 | Transport Layer Address of the gNB-CU-CP | - | - |
| >>Cause | M |  | 9.3.1.2 |  |  |  |
| Criticality Diagnostics | O |  | 9.3.1.3 |  | YES | ignore |
| Transport Network Layer Address Info | O |  | 9.3.2.7 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofTNLAssociations | Maximum numbers of TNL Associations between the gNB-CU-CP and the gNB-CU-UP. Value is 32. |

#### 9.2.1.15 GNB-CU-CP CONFIGURATION UPDATE FAILURE

This message is sent by the gNB-CU-UP to indicate gNB-CU-CP Configuration 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 |

#### 9.2.1.16 E1 RELEASE REQUEST

This message is sent by both the gNB-CU-CP and the gNB-CU-UP and is used to request the release of the E1 interface.

Direction: gNB-CU-CP → gNB-CU-UP and 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 |

#### 9.2.1.17 E1 RELEASE RESPONSE

This message is sent by both the gNB-CU-CP and the gNB-CU-UP as a response to an E1 RELEASE REQUEST message.

Direction: gNB-CU-UP → gNB-CU-CP and 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 |

#### 9.2.1.18 GNB-CU-UP STATUS INDICATION

This message is sent by the gNB-CU-UP to indicate to the gNB-CU-CP its status of overload.

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 |
| gNB-CU-UP Overload Information | M |  | ENUMERATED (overloaded, not-overloaded) |  | YES | reject |

#### 9.2.1.19 RESOURCE STATUS REQUEST

This message is sent by an gNB-CU-CP to gNB-CU-UP to initiate the requested measurement according to the parameters given in the message.

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 | |
| gNB-CU-CP Measurement ID | M |  | INTEGER (1..4095,...) | Allocated by gNB-CU-CP | YES | reject | |
| gNB-CU-UP Measurement ID | C-ifRegistrationRequestStop |  | INTEGER (1..4095,...) | Allocated by gNB-CU-UP | YES | ignore | |
| Registration Request | M |  | ENUMERATED(start, stop, …) | Type of request for which the resource status is required. | YES | ignore | |
| Report Characteristics | C-ifRegistrationRequestStart |  | BITSTRING  (SIZE(32)) | Each position in the bitmap indicates measurement object the gNB-CU-UP is requested to report.  First Bit = TNL Available Capacity Ind Periodic,  Second Bit = HW Capacity Ind Periodic.  Other bits shall be ignored by the gNB-CU-UP. | YES | reject |
| Reporting Periodicity | O |  | ENUMERATED (500ms, 1000ms, 2000ms, 5000ms, 10000ms, 20000ms, 30000ms, 40000ms, 50000ms, 60000ms, 70000ms, 80000ms, 90000ms, 100000ms, 110000ms, 120000ms, …) | Periodicity that can be used for reporting. Also used as the averaging window length for all measurement object if supported. | YES | ignore |

|  |  |
| --- | --- |
| Condition | Explanation |
| ifRegistrationRequestStop | This IE shall be present if the *Registration Request* IE is set to the value “stop” |
| ifRegistrationRequestStart | This IE shall be present if the *Registration Request* IE is set to the value "start". |

#### 9.2.1.20 RESOURCE STATUS RESPONSE

This message is sent by the gNB-CU-UP to indicate that the requested measurement, for all the measurement objects included in the measurement is successfully initiated.

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 |
| gNB-CU-CP Measurement ID | M |  | INTEGER (1..4095,...) | Allocated by gNB-CU-CP | YES | reject |
| gNB-CU-UP Measurement ID | M |  | INTEGER (1..4095,...) | Allocated by gNB-CU-UP | YES | ignore |
| Criticality Diagnostics | O |  | 9.3.1.3 |  | YES | ignore |

#### 9.2.1.21 RESOURCE STATUS FAILURE

This message is sent by the gNB-CU-UP to indicate that for any of the requested measurement objects the measurement cannot be initiated.

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 |
| gNB-CU-CP Measurement ID | M | |  | INTEGER (1..4095,...) | Allocated by gNB-CU-CP | YES | reject |
| gNB-CU-UP Measurement ID | C-ifRegistrationRequestStop | |  | INTEGER (1..4095,...) | Allocated by gNB-CU-UP | YES | ignore |
| Cause | M | |  | 9.3.1.2 | Ignored by the receiver when the Complete Failure Cause Information IE is included | YES | ignore |
| Criticality Diagnostics | | O |  | 9.3.1.3 |  | YES | ignore |

|  |  |
| --- | --- |
| Condition | Explanation |
| ifRegistrationRequestStop | This IE shall be present if the *Registration Request* IE is set to the value “stop” |

#### 9.2.1.22 RESOURCE STATUS UPDATE

This message is sent by gNB-CU-UP to gNB-CU-CP to report the results of the requested measurements.

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 | Ignore | |
| Transaction ID | M |  | 9.3.1.53 |  | YES | Reject | |
| gNB-CU-CP Measurement ID | M |  | INTEGER (1..4095,...) | Allocated by gNB-CU-CP | YES | Reject |
| gNB-CU-UP Measurement ID | M |  | INTEGER (1..4095,...) | Allocated by gNB-CU-UP | YES | Reject |
| TNL Available Capacity Indicator | O |  | 9.3.1.72 |  |  |  |
| HW Capacity Indicator | O |  | 9.3.1.73 |  |  |  |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofSPLMNs | Maximum no. of Supported PLMN Ids. Value is 12. |
| maxnoofSliceItems | Maximum no. of signalled slice support items. Value is 1024. |

## 9.3 Information Element Definitions

### 9.3.2 Transport Network Layer Related IEs

#### 9.3.2.1 UP Transport Layer Information

The *UP Transport Layer Information* IE identifies an transport bearer associated to a DRB. It contains a Transport Layer Address and a GTP Tunnel Endpoint Identifier. The Transport Layer Address is an IP address to be used for the user plane transport.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| CHOICE *Transport Layer Information* | M |  |  |  |
| >*GTP Tunnel* |  |  |  |  |
| >>Transport Layer Address | M |  | 9.3.2.4 |  |
| >>GTP-TEID | M |  | 9.3.2.3 |  |

#### 9.3.2.2 CP Transport Layer Information

This IE is used to provide the E1 control plane transport layer information associated with an gNB-CU-CP and gNB-CU-UP pair.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| CHOICE *CP Transport Layer Information* |  |  | |  |  |  |  |
| >*Endpoint-IP-address* |  |  | |  |  | - | - |
| >> Endpoint IP address | M |  | | Transport Layer Address  9.3.2.4 |  | - | - |
| >Endpoint-IP-address-and-port |  | |  |  |  | YES | reject |
| >>Endpoint IP address | M | |  | Transport Layer Address  9.3.2.4 |  | - | - |
| >>Port Number | M | |  | BIT STRING (SIZE(16)) |  | - | - |

#### 9.3.2.3 GTP-TEID

The *GTP-TEID* IE is the GTP Tunnel Endpoint Identifier to be used for the user plane transport.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| GTP-TEID | M |  | OCTET STRING (SIZE(4)) | For details and range, see TS 29.281 [15]. |

#### 9.3.2.4 Transport Layer Address

This *Transport Layer Address* IE is an IP address.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| Transport Layer Address | M |  | BIT STRING (SIZE(1..160, …)) | The Radio Network Layer is not supposed to interpret the address information. It should pass it to the Transport Layer for interpretation.  For details, see TS 38.414 [16]. |

#### 9.3.2.5 Data Forwarding Information Request

This IE offers the possibility for the gNB-CU-CP to request data forwarding addresses to the gNB-CU-UP. It also offers the possibility for the gNB-CU-CP to provide a list of QoS flows subject to PDU Session level or DRB level data forwarding to the gNB to which DRBs or QoS flows have been offloaded.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| Data Forwarding Request | M |  | ENUMERATED (UL, DL, both, …) |  |
| QoS Flows forwarded on the forwarding tunnel(s) | O |  | QoS Flow Mapping List  9.3.1.59 | This IE contains information for which QoS flows forwarded data packets are sent on:  - either the PDU Session forwarding tunnel (UL and DL)  - or the DRB forwarding tunnel (UL and DL). |

#### 9.3.2.6 Data Forwarding Information

This IE provides the data forwarding information when performing handover or data offloading.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| UL Data Forwarding | O |  | UP Transport Layer Information  9.3.2.1 |  | - | - |
| DL Data Forwarding | O |  | UP Transport Layer Information  9.3.2.1 |  | - | - |
| Data Forwarding to NG-RAN QoS Flow Information List |  | *0..1* |  | Providing QoS flows accepted for data forwarding to the source gNB-CU-UP. | YES | ignore |
| >Data Forwarding to NG-RAN QoS Flow Information List Item |  | *1..<maxnoofQoSflows>* |  |  | - | - |
| >>QoS Flow Identifier | M |  | QoS Flow Identifier  9.3.1.24 |  | - | - |

#### 9.3.2.7 Transport Network Layer Address Info

This IE is used for signalling TNL address information.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| **Transport UP Layer Addresses Info to Add List** |  | 0..1 |  |  |
| **>Transport UP Layer Addresses Info to Add Item** |  | *1..<maxnoofTLAs>* |  |  |
| >>IPsec Transport Layer Address | M |  | Transport Layer Address  9.3.2.4 | Transport Network Layer address for IPsec endpoint. |
| **>>GTP Transport Layer Addresses To Add List** |  | *0..1* |  |  |
| **>>>GTP Transport Layer Addresses To Add Item** |  | *1..<maxnoofGTPTLAs>* |  |  |
| >>>>GTP Transport Layer Address Info | M |  | Transport Layer Address  9.3.2.4 | GTP Transport Layer Addresses for GTP end-points. |
| **Transport UP Layer Addresses Info to Remove List** |  | *0..1* |  |  |
| **>Transport UP Layer Addresses Info to Remove Item** |  | *1..<maxnoofTLAs>* |  |  |
| >>IPsec Transport Layer Address | M |  | Transport Layer Address  9.3.2.4 | Transport Network Layer address for IPsec endpoint. |
| **>>GTP Transport Layer Addresses To Remove List** |  | *0..1* |  |  |
| **>>>GTP Transport Layer Addresses To Remove Item** |  | *1..<maxnoofGTPTLAs>* |  |  |
| >>>>GTP Transport Layer Address Info | M |  | Transport Layer Address  9.3.2.4 | GTP Transport Layer Addresses for GTP end-points. |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofTLAs | Maximum no. of Transport Layer Addresses in the message. Value is 16. |
| maxnoofGTPTLAs | Maximum no. of GTP Transport Layer Addresses for a GTP end-point in the message. Value is 16. |

#### 9.3.2.8 URI

This IE is defined to contain a URI address.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| **URI** | M |  | VisibleString | String representing URI (Uniform Resource Identifier) |